CONTRACT DOCUMENTS
TECHNICAL SPECIFICATIONS

FOR

Manatee County
End of Service Life – Project Package A

September 2018

PROJECT OWNER:

County of Manatee, Florida
c/o Manatee County Purchasing Division
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INFRASTRUCTURE ENGINEERING STANDARD SPECIFICATIONS

DIVISION 1 GENERAL REQUIREMENT

DIVISION 2 SITE WORK

SECTION 01005

GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE AND INTENT

A. Description

The work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all work included in this Contract.

B. Work Included

The Contractor shall furnish all labor, superintendence, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, shop drawings, working drawings and other means of construction necessary or proper for performing and completing the work. He shall obtain and pay for all required permits necessary for the work, other than those permits such as the DEP permit and railroad permit, which may have already been obtained. He shall perform and complete the work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the County, and in strict accordance with the Contract Documents. The Contractor shall clean up the work and maintain it during and after construction, until accepted, and shall do all work and pay all incidental costs. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the work.

The cost of incidental work described in these General Requirements, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made.

The Contractor shall be solely responsible for the adequacy of his workmanship, materials and equipment.

C. Public Utility Installations and Structures

Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes and all other appurtenances and facilities pertaining thereto.

The Contractor shall protect all installations and structures from damage during the work. Access across any buried public utility installation or structure shall be made only in such locations and by means approved by the County. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor, which are shown on the Plans or have been located in the field by the utility, shall be repaired by the Contractor, at his expense, as approved by the County. No separate payment shall be made for such protection or repairs to public utility installations or structures.

Public utility installations or structures owned or controlled by the County or other governmental body, which are required by this contract to be removed, relocated, replaced or rebuilt by the Contractor not identified in any separate bid item shall be considered as a part of the general cost of doing the work and shall be included in the prices bid for the various contract items. No separate payment shall be made.

Where public utility installations or structures owned or controlled by the County or other governmental body are encountered during the course of the work, and are not indicated on the Plans or in the Specifications, and when, in the opinion of the County, removal, relocation, replacement or rebuilding is necessary to complete the work under this Contract, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the County, for the contractor to accomplish. If such work is accomplished by the utility having jurisdiction, it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be in accordance with the General and Supplemental General Conditions.

The Contractor shall give written notice to County and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least forty-eight hours in advance of breaking ground in any area or on any unit of the work. This can be accomplished by making the appropriate contact with the "Sunshine State One-Call of Florida, Inc. Call Center ("Call Sunshine") and per all requirements provided for in the Florida Underground Facilities Damage Prevention and Safety Act (Florida Statutes, Title XXXIII, Chapter 556).

The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the County.

1.02 PLANS AND SPECIFICATIONS

A. Plans

When obtaining data and information from the Plans, figures shall be used in preference to scaled dimensions, and large-scale drawings in preference to small-scale drawings.

B. Copies Furnished to Contractor

The Contractor shall furnish each of the subcontractors, manufacturers, and material men such copies of the Contract Documents as may be required for their work. Additional copies of the Plans and Specifications, when requested, may be furnished to the Contractor at cost of reproduction.

C. Supplementary Drawings

When, in the opinion of the County, it becomes necessary to explain more fully the work to be done or to illustrate the work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the County and five paper prints thereof will be given to the Contractor.

D. Contractor to Check Plans and Data

The Contractor shall verify all dimensions, quantities and details shown on the Plans, Supplementary Drawings, Schedules, Specifications or other data received from the County, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the County, should such errors or omissions be discovered. All schedules are given for the convenience of the County and the 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.

E. Specifications

The Technical Specifications consist of three parts: General, Products and Execution. The General Section contains General Requirements which govern the work. Products and Execution modify and supplement these by detailed requirements for the work and shall always govern whenever there appears to be a conflict.

F. Intent

All work called for in the Specifications applicable to this Contract, but not shown on the Plans in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Plans 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.

The apparent silence of the Specifications 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, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

The inclusion of the Related Requirements (or work specified elsewhere) in the General part of the specifications is only for the convenience of the Contractor, and shall not be interpreted as a complete list of related Specification Sections.

1.03 MATERIALS AND EQUIPMENT

A. Manufacturer

All transactions with the manufacturers or subcontractors shall be through the Contractor, unless the Contractor shall request, in writing to the County, that the manufacturer or subcontractor deal directly with the County. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.

Any two or more pieces or material or equipment of the same kind, type or classification, and being used for identical types of services, shall be made by the same manufacturer.

B. Delivery

The Contractor shall deliver materials in ample quantities to insure the most speedy and uninterrupted progress of the work so as to complete the work within the allotted time. The Contractor shall also coordinate deliveries in order to avoid delay in, or impediment of, the progress of the work of any related Contractor.

C. Tools and Accessories

The Contractor shall, unless otherwise stated in the Contract Documents, furnish with each type, kind or size of equipment, one complete set of suitably marked high grade special tools and appliances which may be needed to adjust, operate, maintain or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good grade cylinder locks and duplicate keys.

Spare parts shall be furnished as specified.

Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight and principal rating data.

D. Installation of Equipment.

The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the work and to handle all emergencies normally encountered in work of this character.

Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Plans, unless directed otherwise by the County during installation. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

The Contractor shall furnish, install and protect all necessary anchor and attachment bolts and all other appurtenances needed for the installation of the devices included in the equipment specified. Anchor bolts shall be as approved by the County and made of ample size and strength for the purpose intended. Substantial templates and working drawings for installation shall be furnished.

The Contractor shall furnish all materials and labor for, and shall properly bed in non-shrink grout, each piece of equipment on its supporting base that rests on masonry foundations.

Grout shall completely fill the space between the equipment base and the foundation. All metal surfaces coming in contact with concrete or grout shall receive a coat of coal tar epoxy equal to Koppers 300M or provide a 1/32-inch neophrene gasket between the metal surface and the concrete or grout.

E. Service of Manufacturer's Engineer

The Contract prices for equipment shall include the cost of furnishing (as required by equipment specifications sections) a competent and experienced engineer or superintendent who shall represent the manufacturer and shall assist the Contractor, when required, to install, adjust, test and place in operation the equipment in conformity with the Contract Documents. After the equipment is placed in permanent operation by the County, such engineer or superintendent shall make all adjustments and tests required by the County to prove that such equipment is in proper and satisfactory operating condition, and shall instruct such personnel as may be designated by the County in the proper operation and maintenance of such equipment.

1.04 INSPECTION AND TESTING

A. General

Inspection and testing of materials will be performed by the County unless otherwise specified.

For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Three (3) copies of the reports shall be submitted and authoritative certification thereof must be furnished to the County as a prerequisite for the acceptance of any material or equipment.

If, in the making of any test of any material or equipment, it is ascertained by the County that the material or equipment does not comply with the Contract, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the County.

Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.

The Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have nor make any claim for damage which may occur to equipment prior to the time when the County formally takes over the operation thereof.

B. Costs

All inspection and testing of materials furnished under this Contract will be performed by the County or duly authorized inspection engineers or inspections bureaus without cost to the Contractor, unless otherwise expressly specified.

The cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents shall be borne by the Contractor and such costs shall be deemed to be included in the Contract price.

Materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract may be tested by the County for compliance. The Contractor shall reimburse the County for the expenditures incurred in making such tests on materials and equipment which are rejected for non-compliance.

C. Inspections of Materials

The Contractor shall give notice in writing to the County, at least two weeks in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture of preparation of materials. Upon receipt of such notice, the County will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials or he will notify the Contractor that the inspection will be made at a point other than the point of manufacture, or he will notify the Contractor that inspection will be waived. The Contractor must comply with these provisions before shipping any material. Such inspection shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

D. Certificate of Manufacture

When inspection is waived or when the County so requires, the Contractor shall furnish to him authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall 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.

E. Shop Tests of Operating Equipment

Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. No such equipment shall be shipped to the work until the County notifies the Contractor, in writing, that the results of such tests are acceptable.

The cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Contractor.

F. Preliminary Field Tests

As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make preliminary field tests of equipment. If the preliminary field tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the Contractor shall, prior to the acceptance tests, make all changes, adjustments and replacements required. The furnishing Contractor shall assist in the preliminary field tests as applicable.

G. Final Field Tests

Upon completion of the work and prior to final payment, all equipment and piping installed under this Contract shall be subjected to acceptance tests as specified or required to prove compliance with the Contract Documents.

The Contractor shall furnish labor, fuel, energy, water and all other materials, equipment and instruments necessary for all acceptance tests, at no additional cost to the County. The Supplier shall assist in the final field tests as applicable.

H. Failure of Tests

Any defects in the materials and equipment or their failure to meet the tests, guarantees or requirements of the Contract Documents shall be promptly corrected by the Contractor. The decision of the County as to whether or not the Contractor has fulfilled his obligations under the Contract shall be final and conclusive. If the Contractor fails to make these corrections or if the improved materials and equipment, when tested, shall again fail to meet the guarantees of specified requirements, the County, notwithstanding its partial payment for work, and materials and equipment, may reject the materials and equipment and may order the Contractor to remove them from the site at his own expense.

In case the County rejects any materials and equipment, then the Contractor shall replace the rejected materials and equipment within a reasonable time. If he fails to do so, the County may, after the expiration of a period of thirty (30) calendar days after giving him notice in writing, proceed to replace such rejected materials and equipment, and the cost thereof shall be deducted from any compensation due or which may become due the Contractor under his Contract.

I. Final Inspection

During such final inspections, the work shall be clean and free from water. In no case will the final pay application be prepared until the Contractor has complied with all requirements set forth and the County has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the Contract Document.

1.05 TEMPORARY STRUCTURES

A. Temporary Fences

If, during the course of the work, it is necessary to remove or disturb any fence or part thereof, the Contractor shall, at his own expense, if so ordered by the County, provide a suitable temporary fence which shall be maintained until the permanent fence is replaced. The County shall be solely responsible for the determination of the necessity for providing a temporary fence and the type of temporary fence to be used.

1.06 TEMPORARY SERVICES

A. First Aid

The Contractor shall keep upon the site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when people are employed on the work.

1.07 LINES AND GRADES

A. Grade

All work under this Contract shall be constructed in accordance with the lines and grades shown on the Plans, or as given by the County. The full responsibility for keeping alignment and grade shall rest upon the Contractor.

B. Safeguarding Marks

The Contractor shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the work, bear the cost of reestablishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or removing without authorization such established points, stakes and marks.

The Contractor shall safeguard all existing and known property corners, monuments and marks adjacent to but not related to the work and, if required, shall bear the cost of reestablishing them if disturbed or destroyed.

C. Datum Plane

All elevations indicated or specified refer to the Mean Sea Level Datum of the NGVD 1929 Datum and/or NAVD 1988.

1.08 ADJACENT STRUCTURES AND LANDSCAPING

A. Responsibility

The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the work, whether or not shown on the Plans, and the removal, relocation and reconstruction of such items called for on the Plans or specified shall be included in the various Contract Items and no separate payments will be made therefore. Where such public and private property, structures of any kind and appurtenances thereto are not shown on the Plans and when, in the opinion of the County, additional work is deemed necessary to avoid interference with the work, payment therefore will be made as provided for in the General Conditions.

Contractor is expressly advised that the protection of buildings, structures, tunnels, tanks, pipelines, etc. and related work adjacent and in the vicinity of his operations, wherever they may be, is solely his responsibility. Conditional inspection of buildings or structures in the immediate vicinity of the project which may reasonably be expected to be affected by the Work shall be performed by and be the responsibility of the Contractor.

Contractor shall, before starting operations, make an examination of the interior and exterior of the adjacent structures, buildings, facilities, etc., and record by notes, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the County. This does not preclude conforming to the requirements of the insurance underwriters. Copies of surveys, photographs, reports, etc., shall be given to the County.

Prior to the beginning of any excavations, the Contractor shall advise the County of all buildings or structures on which he intends to perform work or which performance of the project work will affect.

B. Protection of Trees

1. All trees and shrubs shall be adequately protected by the Contractor with boxes and otherwise and in accordance with ordinances governing the protection of trees. No excavated materials shall be placed so as to injure such trees or shrubs. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by him with new stock of similar size and age, at the proper season and at the sole expense of the Contractor.
2. Beneath trees or other surface structures, where possible, pipelines may be built in short tunnels, backfilled with excavated materials, except as otherwise specified, or the trees or structures carefully supported and protected from damage.
3. The County may order the Contractor, for the convenience of the County, to remove trees along the line or trench excavation. If so ordered, the County will obtain any permits required for removal of trees. Such tree removal ordered shall be paid for under the appropriate Contract Items.

C. Lawn Areas

Lawn areas shall be left in as good condition as before the starting of the work. Where sod is to be removed, it shall be carefully removed, and later replaced, or the area where sod has been removed shall be restored with new sod.

D. Restoration of Fences

Any fence, or part thereof, that is damaged or removed during the course of the work shall be replaced or repaired by the Contractor and shall be left in as good a condition as before the starting of the work. The manner in which the fence is repaired or replaced and the materials used in such work shall be subject to the approval of the County. The cost of all labor, materials, equipment, and work for the replacement or repair of any fence shall be deemed included in the appropriate Contract Item or items, or if no specific Item is provided therefore, as part of the overhead cost of the work, and no additional payment will be made therefore.

1.09 PROTECTION OF WORK AND PUBLIC

A. Barriers and Lights

During the prosecution of the work, the Contractor shall put up and maintain at all times such barriers and lights as will effectually prevent accidents. The Contractor shall provide suitable barricades, red lights, "danger" or "caution" or "street closed" signs and watchmen at all places where the work causes obstructions to the normal traffic or constitutes in any way a hazard to the public, in accordance with state and local requirements.

B. Smoke Prevention

A strict compliance with ordinances regulating the production and emission of smoke will be required. No open fires will be permitted.

C. Noise

The Contractor shall eliminate noise to as great an extent as practicable at all times. Air compressing plants shall be equipped with silencers and the exhaust of all engines or other power equipment shall be provided with mufflers. In the vicinity of hospitals and schools, special care shall be used to avoid noise or other nuisances. The Contractor shall strictly observe all local regulations and ordinances covering noise control.

D. Access to Public Services

Neither the materials excavated nor the materials or plant used in the construction of the work shall be so placed as to prevent free access to all fire hydrants, valves or manholes.

E. Dust prevention

The Contractor shall prevent dust nuisance from his operations or from traffic by keeping the roads and/or construction areas sprinkled with water at all times.

1.10 CUTTING AND PATCHING

The Contractor shall do all cutting, fitting or patching of his portion of the work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the County and in accordance with the Plans and Specifications. The work must be done by competent workmen skilled in the trade required by the restoration.

1.11 CLEANING

A. During Construction

During construction of the work, the Contractor shall, at all times, keep the site of the work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the County,

such material, debris, or rubbish constitutes a nuisance or is objectionable. The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops.

B. Final Cleaning

At the conclusion of the work, all equipment, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.

The Contractor shall thoroughly clean all equipment and materials installed by him and shall deliver such materials and equipment undamaged in a bright, clean, polished and new operating condition.

1.12 MISCELLANEOUS

A. Protection Against Siltation and Bank Erosion

1. The Contractor shall arrange his operations to minimize siltation and bank erosion on construction sites and on existing or proposed water courses and drainage ditches.
2. The Contractor, at his own expense, shall remove any siltation deposits and correct any erosion problems as directed by the County which results from his construction operations.

B. Protection of Wetland Areas

The Contractor shall properly dispose of all surplus material, including soil, in accordance with Local, State and Federal regulations. Under no circumstances shall surplus material be disposed of in wetland areas as defined by the Florida Department of Environmental Protection or Southwest Florida Water Management District.

C. Existing Facilities

The work shall be so conducted to maintain existing facilities in operation insofar as is possible. Requirements and schedules of operations for maintaining existing facilities in service during construction shall be as described in the Special Provisions.

D. Use of Chemicals

All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS/REQUIREMENTS INCLUDED

A. The work included, but is not limited to, in this contract consists of the following:

Force Main 28A:

1. Construction of approximately 1,560 LF of 6-inch force main from Lift Station 28A to a manhole north of the intersection of 57th Avenue West and 24th Street West.
2. Construction of approximately 140 LF of 4-inch force main from a point of connection on the US Post Office force main at the US Post Office right of way to a manhole south of the 57th Avenue West and 20th Street West intersection.

Port Manatee FM:

3. Construction of approximately 2,090 LF of 4-inch force main from Port Manatee Lift Station 2 to a manhole near the intersection of North Dock Street and Eastern Avenue, including all connections to existing lift stations. The proposed force main will tie into a portion of recently replaced 4-inch Force Main Port Manatee that extends from the intersection of South Dock Street and Regal Cruise Way to the intersection of South Dock Street and South Terminal Street.

Orlando Force Main:

4. Construction of approximately 2,300 LF of 10-inch force main from Lift Station 26A to a manhole near the intersection of 14th Street West and 46th Avenue Drive West.

All Projects:

5. All projects include restoration of pavement and asphalt that will be disturbed by the construction of the force mains; restoration of all concrete, brick, and shell driveways; landscaping, grass, removal and replacement of mailboxes and signs.

B. The Contractor shall furnish all shop drawings, working drawings, labor, materials, equipment, tools, services and incidentals necessary to complete all work required by these Specifications and as shown on the Contract Drawings.

C. The Contractor shall perform the work complete, in place and ready for continuous service and shall include any repairs, replacements, and/or restoration required as a result of damages caused prior to acceptance by the County.

D. The Contractor shall furnish and install all materials, equipment and labor which is reasonably and properly inferable and necessary for the proper completion of the work, whether specifically indicated in the Contract Documents or not.

1.02 CONTRACTS

Construct all the Work under a single contract.

1.03 WORK SEQUENCE

A. All work done under this Contract shall be done with a minimum of inconvenience to the users of the system or facility. The Contractor shall coordinate his work with private property owners such that existing utility services are maintained to all users to the maximum extent possible.

B. The Contractor shall, if necessary and feasible, construct the work in stages to accommodate the County's use of the premises during the construction period; coordinate the construction schedule and operations with the County's Representative.

C. The Contractor shall, where feasible, construct the Work in stages to provide for public convenience and not close off public use of any facility until completion of construction to provide alternative usage.

1.04 CONSTRUCTION AREAS

A. The Contractor shall: Limit his use of the construction areas for work and for storage, to allow for:

1. Work by other Contractors.
2. County's Use.
3. Public Use.

B. Coordinate use of work site under direction of County's Representative.

C. Assume full responsibility for the protection and safekeeping of products under this Contract, stored on the site.

D. Move any stored products under the Contractor's control, which interfere with operations of the County or separate contractor.

E. Obtain and pay for the use of additional storage of work areas needed for Contractor operations.

1.05 COUNTY OCCUPANCY

A. It is assumed that portions of the Work will be completed prior to completion of the entire Work. Upon completion of construction of each individual facility, including testing, if the County, at its sole discretion, desires to accept the individual facility, the Contractor will be issued a dated certificate of completion and acceptance for each individual facility. The County will assume ownership and begin operation of the individual facility on that date and the three-year guaranty period shall commence on that date. The County has the option of not accepting the entire work as a whole until it is completed, tested and approved by the County.

1.06 PARTIAL COUNTY OCCUPANCY

The Contractor shall schedule his operations for completion of portions of the Work, as designated, for the County's occupancy prior to substantial completion of the entire work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01015

CONTROL OF WORK

PART 1 GENERAL

1.01 WORK PROGRESS

The Contractor shall furnish personnel and equipment which will be efficient, appropriate and adequately sized to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Contract. If at any time such personnel appears to the County to be inefficient, inappropriate, or insufficient for securing the quality of work required for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the personnel and equipment and the Contractor shall conform to such order. Failure of the County to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.02 PRIVATE LAND

The Contractor shall not enter or occupy private land outside of easements, except by permission of the affected property owner.

1.03 WORK LOCATIONS

Work shall be located substantially as indicated on the drawings, but the County reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons.

1.04 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the County may require special construction procedures such as limiting the length of open trench, prohibiting stacking excavated material in the street and requiring that the trench shall not remain open overnight.

B. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be barricaded and well lighted at all times when construction is not in progress.

1.05 DISTRIBUTION SYSTEMS AND SERVICES

A. The Contractor shall avoid interruptions to water, telephone, cable TV, sewer, gas, or other related utility services. He shall notify the County and the appropriate agency well in advance of any requirement for dewatering, isolating, or relocating a section of a utility, so that necessary arrangements may be made.

B. If it appears that utility service will be interrupted for an extended period, the County may order the Contractor to provide temporary service lines at the Contractor's expense. Inconvenience of the users shall be kept to the minimum, consistent with existing conditions. The safety and integrity of the systems are of prime importance in scheduling work.

1.06 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall assume full responsibility for the protection of all buildings, structures and utilities, public or private, including poles, signs, services to building utilities, gas pipes, water pipes, hydrants, sewers, drains and electric and telephone cables and other similar facilities, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operation shall be repaired by the Contractor at his expense.

B. The Contractor shall bear full responsibility for obtaining locations of all underground structures and utilities (including existing water services, drain lines and sewers). Services to buildings shall be maintained and all costs or charges resulting from damage thereto shall be paid by the Contractor.

C. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the unit prices established in the Bid.

D. If, in the opinion of the County, permanent relocation of a utility owned by the County is required, he may direct the Contractor, in writing, to perform the work. Work so ordered will be paid for at the Contract unit prices, if applicable, or as extra work as classified in the General Conditions. If relocation of a privately-owned utility is required, the County will notify the utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the County and utility and shall have no claim for delay due to such relocation. The Contractor shall notify public utility companies in writing at least 48 hours (excluding Saturdays, Sundays and legal holidays) before excavating near their utilities.

1.07 TEST PITS

Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor immediately after the utility location and the surface shall be restored in a manner equal or better than the original condition. No separate payment will be made.

1.08 CARE AND PROTECTION OF PROPERTY

A. The Contractor shall be responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition equal or better to that existing before the damage was done, or he shall make good the damage in another manner acceptable to the County.

B. All sidewalks which are disturbed by the Contractor's operations shall be restored to their original or better condition by the use of similar or comparable materials. All curbing shall be restored in a condition equal to the original construction and in accordance with the best modern practice.

C. Along the location of this work, all fences, walks, bushes, trees, shrubbery and other physical features shall be protected and restored in a thoroughly workmanlike manner unless otherwise shown on the drawings. Fences and other features removed by the Contractor shall be replaced in the location indicated by the County as soon as conditions permit. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be regraded and sodded to equal or exceed original conditions.

D. Trees close to the work which drawings do not specify to be removed, shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are liable to damage because of his operations, but in no case shall any tree be cut or removed without prior notification to the County. All injuries to bark, trunk, limbs and roots of trees shall be repaired by dressing, cutting and painting according to approved methods, using only approved tools and materials.

E. The protection, removal and replacement of existing physical features along the line of work shall be a part of the work under the Contract and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the Bid.

1.09 MAINTENANCE OF TRAFFIC

A. Open pits, trenches, unpaved streets, debris, or other obstructions due to construction that will prevent the normal flow of traffic during an extended construction stoppage, for any reason, shall be minimized. In the event an extended construction stoppage is found to be necessary, Contractor shall, at his own expense, provide normal traffic flow during extended construction stoppage. Extended stoppage will be defined by the County.

B. All excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the Contractor's operations cause traffic hazards, he shall repair the road surface, provide temporary roadways, erect wheel guards or fences, or take other safety measures which are satisfactory to the County.

C. Any changes to the traffic pattern require a Traffic Control Plan as detailed in section 01570 of this specification.

1.10 WATER FOR CONSTRUCTION PURPOSES

A. In locations where public water supply is available, the Contractor may purchase water for all construction purposes.

B. The Contractor shall be responsible for paying for all water tap fees incurred for the purpose of obtaining a potable water service or temporary use meter.

1.11 MAINTENANCE OF FLOW

The Contractor shall at his own cost, provide for the flow of sewers, drains and water courses interrupted during the progress of the work and shall immediately cart away and remove all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the County well in advance of the interruption of any flow.

1.12 CLEANUP

During the course of the work, the Contractor shall keep the site of his operations in as clean and neat a condition as is possible. He shall dispose of all residue resulting from the construction work and at the conclusion of the work, he shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction operations and shall leave the entire site of the work in a neat and orderly condition.

1.13 COOPERATION WITHIN THIS CONTRACT

A. All firms or person authorized to perform any work under this Contract shall cooperate with the General Contractor and his subcontractors or trades and shall assist in incorporating the work of other trades where necessary or required.

B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the County.

1.14 PROTECTION OF CONSTRUCTION AND EQUIPMENT

A. All newly constructed work shall be carefully protected from injury in any way. No wheeling or walking or placing of heavy loads on it shall be allowed and all portions injured shall be reconstructed by the Contractor at his own expense.

B. All structures shall be protected in a manner approved by the County. Should any of the floors or other parts of the structures become heaved, cracked, or otherwise damaged, all such damaged portions of the work shall be completely repaired and made good by the Contractor, at his own expense and to the satisfaction of the County. If, in the final inspection of the work, any defects, faults, or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and

workmanship without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein, for at least the warranty period described in the Contract.

C. Further, the Contractor shall take all necessary precautions to prevent damage to any structure due to water pressure during and after construction and until such structure is accepted and taken over by the County.

1.15 CONSTRUCTION WITHIN RIGHT-OF-WAY

Where pipe lines are installed within FDOT right-of-way, all excavation backfill and compaction for the purpose of reconstructing roadways and/or adjacent slopes contiguous thereto shall be in accordance with FDOT or Manatee County Standards and Specifications, whichever is applicable. Contractor shall satisfy the authorized representative of the FDOT with respect to proper safety procedures, construction methods, required permitting, etc., within the FDOT right-of-way.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01030

SPECIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 PERMITS

Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the County to do the work from the appropriate governmental agency or agencies. No work shall commence until all applicable permits have been obtained and copies delivered to the County. The costs for obtaining all permits shall be borne by the Contractor.

1.02 CONNECTIONS TO EXISTING SYSTEM

The Contractor shall perform all work necessary to locate, excavate and prepare for connections to the existing systems all as shown on the Drawings or where directed by the County. The cost for this work and for the actual connection shall be included in the price bid for the project and shall not result in any additional cost to the County. The termination point for each contract shall be as shown on the Contract Drawings.

1.03 RELOCATIONS

The Contractor shall be responsible for the coordination of the relocation of structures, including but not limited to light poles, power poles, signs, sign poles, fences, piping, conduits and drains that interfere with the positioning of the work as set out on the Drawings. No relocation of the items under this Contract shall be done without approval from the County.

1.04 EXISTING UNDERGROUND PIPING, STRUCTURES AND UTILITIES

A. The attention of the Contractor is drawn to the fact that during excavation, the possibility exists of the Contractor encountering various utility lines not shown on the Drawings. The Contractor shall exercise extreme care before and during excavation to locate and flag these lines as to avoid damage to the existing lines.

B. It is the responsibility of the Contractor to ensure that all utility or other poles, the stability of which may be endangered by the close proximity of excavation, are temporarily stayed in position while work proceeds in the vicinity of the pole and that the utility or other companies concerned be given reasonable advance notice.

C. The existing utility locations are shown without express or implied representation, assurance, or guarantee that they are complete or correct or that they represent a true picture of underground piping to be encountered. The Contractor shall be responsible for notifying the various utility companies to locate their respective utilities in advance of construction in conformance with all requirements provided for in the Florida Underground Facilities Damage Prevention and Safety Act (Florida Statutes, Title XXXIII, Chapter 556).

D. The existing piping and utilities that interfere with new construction shall be rerouted as shown, specified, or required. Before any piping and utilities not shown on the Drawings are disturbed, the Contractor shall notify the County and shall provide suggestions on how best to resolve the issue.

E. The Contractor shall exercise care in any excavation to locate all existing piping and utilities. All utilities which do not interfere with complete work shall be carefully protected against damage. Any existing utilities damaged in any way by the Contractor shall be restored or replaced by the Contractor at his expense as directed by the County.

F. It is intended that wherever existing utilities such as water, sewer, gas, telephone, electrical, or other service lines must be crossed, deflection of the pipe within recommended limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated in the Drawings. However, when in the opinion of the County this procedure is not feasible, he may direct the use of fittings for a utilities crossing as detailed on the Drawings. No deflections will be allowed in gravity sanitary sewer lines or in existing storm sewer lines.

1.05 SUSPENSION OF WORK DUE TO WEATHER

Refer to FDOT Standards and Specifications Book, Section 8.

1.06 HURRICANE PREPAREDNESS PLAN

A. Within 30 days of the date of Notice to Proceed, the Contractor shall submit to the County a Hurricane Preparedness Plan. The plan should outline the necessary measures which the Contractor proposes to perform at no additional cost to the County in case of a hurricane warning.

B. In the event of inclement weather, or whenever County shall direct, Contractor shall insure that he and his Subcontractors shall carefully protect work and materials against damage or injury from the weather. If, in the opinion of the County, any portion of work or materials is damaged due to the failure on the part of the Contractor or Subcontractors to protect the work, such work and materials shall be removed and replaced at the expense of the Contractor.

1.07 POWER SUPPLY

Electricity as may be required for construction and permanent power supply shall be secured and purchased by the Contractor.

1.08 SALVAGE

Any existing equipment or material, including, but not limited to, valves, pipes, fittings, couplings, etc., which is removed or replaced as a result of construction under this project may be designated as salvage by the County and if so shall be protected for a reasonable time until picked up by the County. Any equipment or material not worthy of salvaging, as directed by the County, shall be disposed of by the Contractor at no additional cost.

1.09 DEWATERING

A. The Contractor shall do all groundwater pumping necessary to prevent flotation of any part of the work during construction operations with his own equipment.

B. The Contractor shall pump out water and wastewater which may seep or leak into the excavations for the duration of the Contract and with his own equipment. He shall dispose of this water in an appropriate manner.

1.10 ADDITIONAL PROVISIONS

A. Before commencing work on any of the existing pipelines, structures or equipment, the Contractor shall notify the County, in writing, at least 10 calendar days in advance of the date he proposes to commence such work.

B. The Contractor shall provide, at his own expense, all necessary temporary facilities for access to and for protection of, all existing facilities. The County's personnel must have ready access at all times to the existing facilities. The Contractor is responsible for all damage to existing structures, equipment and facilities caused by his construction operations and must repair all such damage when and as ordered by the County.

1.11 CONSTRUCTION CONDITIONS

The Contractor shall strictly adhere to the specific requirements of the governmental unit(s) and/or agency(ies) having jurisdiction over the work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

1.12 PUBLIC NUISANCE

A. The Contractor shall not create a public nuisance including but not limited to encroachment on adjacent lands, flooding of adjacent lands, excessive noise or dust.

B. Sound levels must meet Manatee County Ordinance #87-34, (which amends Ordinance 81-3, The Manatee County Noise Control Ordinance). Sound levels in excess of such ordinance are sufficient cause to have the work halted until equipment can be quieted to these levels. Work stoppage by the County for excessive noise shall <u>not</u> relieve the Contractor of the other portions of this specification.

C. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

1.13 WARRANTIES

A. All material supplied under these Specifications shall be warranted by the Contractor and the manufacturers for a period of three (3) years. Warranty period shall commence on the date of County acceptance.

B. The material shall be warranted to be free from defects in workmanship, design and materials. If any part of the system should fail during the warranty period, it shall be replaced at no expense to the County. All material and installation costs shall be 100% borne by the Contractor.

C. The manufacturer's warranty period shall run concurrently with the Contractor's warranty or guarantee period. No exception to this provision shall be allowed. The Contractor shall be responsible for obtaining warranties from each of the respective suppliers or manufacturers for all the material specified under these contract specifications,

D. In the event that the manufacturer is unwilling to provide a three-year warranty commencing at the time of County acceptance, the Contractor shall obtain from the manufacturer a four (4) year warranty starting at the time of equipment delivery to the job site. This four-year warranty shall not relieve the Contractor of the three-year warranty starting at the time of County acceptance of the equipment.

1.14 FUEL STORAGE & FILLING

A. If the contractor is storing fuel on site, or doing his own fuel filling of portable equipment (other than hand-held equipment), he is responsible for any required response, clean-up or reporting required, at no additional cost to the county.

B. The Contractor shall prepare and submit a fuel storage / spill abatement plan prior to start of construction if required.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall be responsible for all cutting, fitting and patching, including 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. Provide penetrations of non-structural surfaces for installation of piping and electrical conduit.

PART 2 PRODUCTS

2.01 MATERIALS

Comply with specifications and standards for each specific product involved.

PART 3 EXECUTION

3.01 INSPECTION

A. Inspect existing conditions of project, 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 work.

C. Report unsatisfactory or questionable conditions to County. Do not proceed with work until County has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support as necessary to assure structural value to integrity of 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.

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. Fit and adjust products to provide a finished installation to comply with specified products, functions, tolerances and finishes.

D. Restore work which has been cut or removed; install new products to provide completed work in accordance with the requirements of the Contract Documents.

E. Replace surfaces airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

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

END OF SECTION

SECTION 01050

FIELD ENGINEERING AND SURVEYING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall provide and pay for field surveying service required for the project.

B. The Contractor shall furnish and set all necessary stakes to establish the lines and grades as shown on the Contract Drawings and layout each portion of the Work of the Contract.

1.02 QUALIFICATION OF SURVEYOR AND ENGINEER

All construction staking shall be conducted by or under the supervision of a Florida Registered Professional Surveyor and Mapper. The Contractor shall be responsible for the layout of all such lines and grades, which will be subject to verification by the County.

1.03 SURVEY REFERENCE POINTS

A. Existing basic horizontal and vertical control points for the Project are designated on the Contract Drawings.

B. Locate and protect all survey monumentation, property corners and project control points prior to starting work and preserve all permanent reference points during construction. All costs associated with the replacement of all survey monumentation, property corners and project control points shall be borne by the Contractor.

Make no changes or relocations without prior written notice to County.

Report to County when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

Require surveyor to replace project control points which may be lost or destroyed.

Establish replacements based on original survey control.

1.04 PROJECT SURVEY REQUIREMENTS

The Contractor shall establish temporary bench marks as needed, referenced to data established by survey control points.

1.05 RECORDS

The Contractor shall employ a Professional Engineer or Surveyor registered in the State of Florida to verify survey data and properly prepare record drawings per Section 01720.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 GENERAL

1.01 REQUIREMENTS

Abbreviations and acronyms used in Contract Documents to identify reference standards.

A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents, or applicable codes established stricter standards.

B. Publication Date: The most recent publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.03 ABBREVIATIONS, NAMES AND ADDRESSES OR ORGANIZATIONS

Obtain copies of reference standards direct from publication source, when needed for proper performance of work, or when required for submittal by Contract Documents.

AA Aluminum Association
818 Connecticut Avenue, N.W.
Washington, DC 20006

AASHTO American Association of State Highway and Transportation Officials
444 North Capital Street, N.W.
Washington, DC 20001

ACI American Concrete Institute
Box 19150
Reford Station
Detroit, MI 48219

AI Asphalt Institute
Asphalt Institute Building
College Park, MD 20740

AISC American Institute of Steel Construction
1221 Avenue of the Americas
New York, NY 10020

AISI American Iron and Steel Institute
1000 16th Street NW
Washington, DC 20036

ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 179l Tullie Circle, N.E. Atlanta, GA 30329
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
CRSI	Concrete Reinforcing Steel Institute 180 North LaSalle Street, Suite 2110 Chicago, IL 60601
FDEP	Florida Department of Environmental Protection 3900 Commonwealth Blvd. Tallahassee, FL 32399
FDOT	Florida Department of Transportation Standards Specifications for Road and Bridge Construction Maps & Publication Sales - Mail Station 12 605 Suwannee St. Tallahassee, FL 32399-0450
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407
MCPW UTIL STD	Manatee County Utility Engineering 4410-B 66th St. W. Bradenton, FL 34210

MLSFA	Metal Lath/Steel Framing Association 221 North LaSalle Street Chicago, IL 60601
MMA	Monorail Manufacturer's Association 1326 Freeport Road Pittsburgh, PA 15238
NAAMM	National Association of Architectural Metal Manufacturers 221 North LaSalle Street Chicago, IL 60601
NEMA	National Electrical Manufacturer's Assoc. 2101 L Street N.W. Washington, DC 20037
OHSA	Occupational Safety and Health Assoc. 5807 Breckenridge Pkwy., Suite A Tampa, FL 33610-4249
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 20076
PCI	Prestressed Concrete Institute 20 North Wacker Drive Chicago, IL 60606
SDI	Steel Door Institute 712 Lakewood Center North Cleveland, OH 44107
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association 8224 Old Court House Road Vienna, VA 22180
SSPC	Steel Structures Painting Council 402 24th Street, Suite 600 Pittsburgh, PA 15213
SWFWMD	Southwest Florida Water Management District 2379 Broad Street Brooksville, FL 34604-6899
UL	Underwriter's Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE

A. The scope of this section of the Contract Documents is to further define the items included in each Bid Item in the Bid Form section of the Contract Documents. Payment will be made based on the specified items included in the description in this section for each bid item.

B. All contract prices included in the Bid Form section will be full compensation for all shop drawings, working drawings, labor, materials, tools, equipment and incidentals necessary to complete the construction as shown on the Drawings and/or as specified in the Contract Documents to be performed under this Contract. Actual quantities of each item bid on a unit price basis will be determined upon completion of the construction in the manner set up for each item in this section of the Specifications. Payment for all items listed in the Bid Form will constitute full compensation for all work shown and/or specified to be performed under this Contract.

1.02 ESTIMATED QUANTITIES

The quantities shown are approximate and are given only as a basis of calculation upon which the award of the Contract is to be made. The County does not assume any responsibility for the final quantities, nor shall the Contractor claim misunderstanding because of such estimate of quantities. Final payment will be made only for satisfactorily completed quantity of each item.

1.03 WORK OUTSIDE AUTHORIZED LIMITS

No payment will be made for work constructed outside the authorized limits of work.

1.04 MEASUREMENT STANDARDS

Unless otherwise specified for the particular items involved, all measurements of distance shall be taken horizontally or vertically.

1.05 AREA MEASUREMENTS

In the measurement of items to be paid for on the basis of area of finished work, the lengths and/or widths to be used in the calculations shall be the final dimensions measured along the surface of the completed work within the neat lines shown or designated.

1.06 LUMP SUM ITEMS

Where payment for items is shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum items. Lump sum contracts shall be complete, tested and fully operable prior to request for final payment. Contractor may be required to provide a break-down of the lump sum totals.

1.07 UNIT PRICE ITEM

Separate payment will be made for the items of work described herein and listed on the Bid Form. Any related work not specifically listed, but required for satisfactory completion of the work shall be considered to be included in the scope of the appropriate listed work items.

No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work. Final payments shall not be requested by the Contractor or made by the County until as-built (record) drawings have been submitted and approved by the County.

1. Shop Drawings, Working Drawings.
2. Clearing, grubbing and grading except as hereinafter specified.
3. Trench excavation, including necessary pavement removal and rock removal, except as otherwise specified.
4. Dewatering and disposal of surplus water.
5. Structural fill, backfill, and grading.
6. Replacement of unpaved roadways, and shrubbery plots.
7. Cleanup and miscellaneous work.
8. Foundation and borrow materials, except as hereinafter specified.
9. Testing and placing system in operation.
10. Any material and equipment required to be installed and utilized for the tests.
11. Pipe, structures, pavement replacement, asphalt and shell driveways and/or appurtenances included within the limits of lump sum work, unless otherwise shown.
12. Maintaining the existing quality of service during construction.
13. Maintaining or detouring of traffic.
14. Appurtenant work as required for a complete and operable system.
15. Seeding and hydromulching.
16. As-built Record Drawings.

BID ITEM – MOBILIZATION

Measurement and payment for this Bid Item shall include full compensation for the required 100 percent (100%) Performance Bond, 100 Percent (100%) Payment Bond, all required insurance for the project and the Contractor's mobilization and demobilization costs as shown in the Bid Form. Mobilization includes, but it not limited to: preparation and movement of personnel, equipment, supplies and incidentals such as safety and sanitary supplies/ facilities.

Payment for mobilization shall not exceed 10 percent (10%) of the total Contract cost unless the Contractor can prove to the County that his actual mobilization cost exceeds 10 percent (10%).

Partial payments for this Bid Item will be made in accordance with the following schedule:

Percent of Original Contract Amount:	Percent Allowable Payment of Mobilization/Demobilization Bid Item Price:
5	25
10	35
25	45
50	50
75	75
100	100

These payments will be subject to the standard retainage provided in the Contract. Payment of the retainage will be made after completion of the work and demobilization.

BID ITEM	DESCRIPTION	UNITS
1,34,61	Mobilization	LS

BID ITEM – MAINTENANCE OF TRAFFIC

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the lump sum price bid for all maintenance of traffic, including coordination with FDOT, including all other local agencies, and all equipment and manpower necessary to comply with the FDOT Design Standards 600 Series.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
2,35,62	Maintenance of Traffic	LS

BID ITEM – PRECONSTRUCTION VIDEO

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum bid for the preconstruction video of the existing site conditions. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
3,36,63	Preconstruction Video	LS

BID ITEM – EROSION AND SEDIMENT CONTROL

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the lump sum price bid for erosion and sediment control, including permitting if required, coordination with federal, state and local agencies and all equipment and manpower necessary to comply with necessary agencies.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
4,37,64	Erosion and Sediment Control	LS

BID ITEM – CLEARING AND GRUBBING

Payment for all work included under this Bid Item shall be quantified by the Contractor and paid for as a lump sum amount for all of the areas that will require clearing and grubbing for the pipe installation and in accordance with the plans and specifications. Clearing and grubbing shall include the removal and disposal of trees, tree roots, rock, abandoned pipe and other features not part of the proposed improvements. The Contractor shall include the cost of any and all permitting required for the burning of removed trees and vegetation.

Unless otherwise indicated herein these documents or in the construction plans, clearing and grubbing includes a ten (10) foot strip along the pipeline route. The contractor will be responsible for making their own determination as to the acreage and quantity of clearing and grubbing.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
5,65	Clearing and Grubbing	LS

BID ITEM - UTILITY LOCATES

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum bid for the location of existing utilities in the project area. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals including road restoration and repair necessary to complete the work, ready for approval and acceptance by the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
6,38,66	Utility Locates	LS

BID ITEM – PROJECT SIGNS

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum bid for the necessary signage required during construction. At least two (2) project signs should be used per project. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
7,39,67	Project Signs	LS

BID ITEM – RECORD DRAWINGS

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the lump sum price bid for as-built record drawings or any other required certifications to put proposed project into service. All items are subject to approval by the Engineer and the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
8,40,68	Record Drawings	LS

BID ITEM – PIGGING AND PRESSURE TESTING

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum bid for test pigging and pressure testing the proposed force main. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
9,41,69	Pigging and Pressure Testing	LS

BID ITEM - PVC (C-900) FORCE MAINS

Payment for all work included in these Bid Items shall be made at the applicable Contract unit price bid per the schedule of prices for furnishing and installing the listed diameter PVC force main (AWWA C-900, CL-150, CL-235) pipe as shown on the Contract Drawings and listed on the Bid Form. Measurement and Payment shall be made for the actual length of the listed diameter pipe and installed and will represent full compensation for all labor, materials, restraints, excavation, including rock, dewatering, bedding, backfill, compaction, testing and equipment required to complete these Bid Items, including removal of existing abandoned pipelines that may be in conflict. No additional compensation shall be made for excavation below the bottom of the pipe, for rock removal or bedding and backfill material, or for repair of any trench settlement.

BID ITEM	DESCRIPTION	UNITS
10	6” DR 18 PVC Pipe	LF
12,42	4” DR 18 PVC Pipe	LF
71	10” DR 18 PVC Pipe	LF

BID ITEM – HDPE PIPE (HDD)

Payment for all work included in these Bid Items shall be made at the applicable Contract unit price bid per the schedule of prices for furnishing and installing the listed diameter HDPE DR 11 pipe by directional drill and associated connection pipe sections as shown on the Contract Drawings and listed on the Bid Form. As part of the testing methods for the HDPE pipe installation, the Contractor shall televise or pull a mandrill through the installed HDPE pipe to verify sound installation

Measurement and Payment shall be made for the actual length of the listed diameter pipe directional drilled and installed, and will represent full compensation for all labor, materials, excavation, including rock, dewatering, bedding, backfill, compaction, testing, pipe restraints, mud trailer, and equipment required to complete these Bid Items. No additional compensation shall be made for excavation below the bottom of the pipe, for rock removal or bedding and backfill material, or for repair of any trench settlement. No additional compensation shall be made for extensive dewatering or any water treatment services or equipment that may be required for contaminated groundwater.

BID ITEM	DESCRIPTION	UNITS
11	6” DR 11 HDPE Pipe	LF
43	4” DR 11 HDPE Pipe	LF
70	16” DR 11 HDPE Pipe	LF
72	10” DR 11 HDPE Pipe	LF

BID ITEM - DUCTILE IRON FITTINGS, WASTEWATER

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid for furnishing and installing each listed ductile iron fitting (Protecto 401 epoxy lined) as shown on the Contract Drawings and listed on the Bid Form. Payment will be made for each fitting installed and will represent full compensation for all labor, material, excavation, stainless steel hardware, mechanical joint restraint, including rock, bedding, backfill, compaction, testing and equipment required to complete these Bid Items.

BID ITEM	DESCRIPTION	UNITS
13	6” 45° Bend	EA
14	6” 11.25° Bend	EA
15,44	4” 45° Bend	EA
45	4” 11.25° Bend	EA
46	4” Tee	EA
73	10” 45° Bend	EA
74	10” 22.5° Bend	EA
75	10” 11.25° Bend	EA

BID ITEM – PLUG VALVES

Payment for all work included in these Bid Items shall be made at the applicable Contract unit price bid per each valve for furnishing and installing the listed diameter valve, box, cover, pipe adaptor, and concrete pad as shown on the Contract Drawings and listed on the Bid Form. All Plug Valves shall be "true" 100% port eccentric plug valves. Payment shall represent full compensation for all labor, material, excavation, including rock as necessary, bedding, backfill, compaction, testing and equipment required to complete these Bid Items.

BID ITEM	DESCRIPTION	UNITS
16	6" Plug Valves	EA
47	4" Plug Valves	EA
76	10" Plug Valves	EA

BID ITEM – BELL JOINT PIPE RESTRAINTS

Payment for all work included in these Bid Items shall be made at the applicable Contract unit price bid per each restraint required to restrain the piping required by the Contract Drawings. Measurement will be based on each complete restraint furnished and installed except where specifically included in another pay item. Payment shall represent full compensation for all labor, material, equipment, excavation, including rock, bedding, backfill, compaction, and testing required to complete this Bid Item. This Bid Item includes the installation of stainless steel hardware, restraints used in restraining PVC and ductile iron pipe of the specified type acceptably furnished and installed as shown on the drawings or where directed by the Project Representative and in accordance with the pipe and restraint manufacturer's requirements. The work shall include, but is not limited to, all bolts, nuts, washers, gaskets, and all other related and necessary materials, work and equipment required or associated with this item.

BID ITEM	DESCRIPTION	UNITS
17	6" Bell Joint Pipe Restraints	EA
18,48	4" Bell Joint Pipe Restraints	EA
77	10" Bell Joint Pipe Restraints	EA

BID ITEM – AIR RELEASE VALVES

Payment for all work included in this Bid Item shall be at the applicable Contract unit price bid per each air release valve for furnishing and installing the listed diameter air release valve, box, cover and concrete pad as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation for all labor, material, excavation, including rock as necessary, bedding, backfill, compaction testing, disinfection and equipment required to complete these Bid Items.

BID ITEM	DESCRIPTION	UNITS
19,49,78	2" ARV Type 2 (Above Ground)	EA

BID ITEM – FORCE MAIN CONNECTIONS

Payment for all work included, but is not limited to, under these Bid Items shall represent full compensation in accordance with the lump sum price bid for proposed connections to force main. Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the lump sum price bid for all labor, fittings, excavation, dewatering, bedding, backfill, compaction, testing, equipment, the temporary shutdown of the existing lift station to connect the proposed force main, and all temporary line stops for force main connections. Bid item should also include the following provisions for each lift station:

LS 28A (2 LS) – 58th Avenue Drive West and 24th Street West, and 57th Avenue and 20th Street West – 2 septic storage trucks
Port Manatee (3 LS) – Regal Cruise Way and Del Monte Way, and Eastern Avenue and Tropicana Way/Apollo Way – 2 septic storage trucks
LS 26A–14th Street West and 46th Avenue Drive West– 2 septic storage trucks
Cortez Plaza 5 Lift Station- 5th Street West and a Cortez Plaza access road- 2 septic storage trucks

Coordinate with Nick Wagner (Lift Station Superintendent) with Manatee County for shutdown of Lift Stations. At least four days' notice needs to be provided to Nick to coordinate shutdown. Phone Number: 941-792-8811 EXT 5377. Connection must also be made outside of peak hours between 9PM and 5AM.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

BID ITEM	DESCRIPTION	UNITS
20,21,50,79	Connection to Existing Force Mains	LS

BID ITEM – CONNECTION TO MANHOLE

Payment for all work included in these Bid Items shall be made at the applicable Contract unit price bid per each manhole connection. Payment shall represent full compensation for all labor, materials, and equipment. For manhole connection this pay items includes, but not limited to, rebuilding the existing bench, coring, fittings, bypass pumping, grout, and relining the manhole.

BID ITEM	DESCRIPTION	UNITS
22,51	Connection to Manhole	EA

BID ITEM – GROUT FILL ABANDONED EXISTING PIPELINES

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the unit price bid per cubic yard of grout fill that is required to abandon all of the existing pipelines to be deactivated. Payment will include all equipment, labor, fittings, temporary connections, flushing of existing pipelines, line-stops, and appurtenances required to abandon the existing force mains in accordance with County standards.

BID ITEM	DESCRIPTION	UNITS
23,52,80	Grout Fill Abandoned Existing Pipelines	CY

BID ITEM – PAVEMENT REPAIR AND ROAD RESTORATION

Payment for all work included in these Bid Items will be made at the applicable Contract unit price listed below for soil, crushed concrete, milling and asphaltic concrete, for the roadway restoration as listed on the Bid Form. Payment shall represent full compensation for all labor, materials and equipment for cutting the edges of existing roadway, compacting subgrade, furnishing and installing the crushed concrete, asphaltic concrete and all incidentals necessary to complete the roadway restoration as shown on the Contract Drawings and included in the Specifications, all ready for approval and acceptance by the County.

BID ITEM	DESCRIPTION	UNITS
24,53,81	Soil Subgrade	CY
25,54,82	Crushed Concrete Base	SY
26,55,83	Structural Course Asphalt Base – SP 12.5	TN
27,56,84	Friction Course Overlay – FC 12.5	TN
28,57,85	Milling	SY

BID ITEM – SODDING

Payment for all work included in this Bid Item will be made at the applicable Contract unit price bid per square yard or each for furnishing and installing like-for-like sod along the project alignment. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the County.

BID ITEM	DESCRIPTION	UNITS
29,58,86	Sodding	SY

BID ITEM – SIDEWALK REPAIR

Payment for all work included under this Bid Item will be made at the Contract unit price bid per square yard of concrete sidewalk installed as shown in the Contract Drawings and as listed on the Bid Form. Measurement will be based on the actual number of square yards of concrete sidewalk installed, tested, completed and approved. No payment for restoration of a private driveway within or outside the right-of-way shall be made under this Bid Item. Sidewalks shall meet the requirements of the Manatee County Transportation Design Standards.

BID ITEM	DESCRIPTION	UNITS
30,87	Sidewalk Repair	SY

BID ITEM - REMOVE AND REPLACE TYPE "A" MIAMI CURB

Payment for all work included in this Bid Item will be made at the applicable Contract unit price bid per linear foot for removal of existing curbing and for furnishing and placing the type "A" Miami curb as shown on the Drawings and listed on the Bid Form. Measurement will be per actual number of linear feet of Miami curbing installed. Payment shall represent full compensation for removal of existing curb and all labor, material and equipment for compacting subgrade, forming, furnishing, placing the concrete, and finishing as specified and all incidentals necessary for completion of this Bid Item, ready for approval and acceptance by the County.

BID ITEM	DESCRIPTION	UNITS
31	Remove and Replace Type "A" Miami Curb	LF

BID ITEM – DRIVEWAY RESTORATION

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid per square yard of asphalt or concrete driveway restoration as listed on the Bid Form. Measurement of driveway restoration will be per the actual number of square yards replaced. Payment shall represent full compensation for all labor, materials and equipment for cutting the edges of existing driveways, compacting subgrade, furnishing and installing the asphalt or concrete including all incidentals necessary to complete the driveway restoration as shown on the Contract Drawings and included in the Specifications, all ready for approval and acceptance by the County.

BID ITEM	DESCRIPTION	UNITS
32,88	Concrete Driveway	SY
33	Asphalt Driveway	SY

BID ITEM - CONCRETE ENCASEMENT

Payment for all work under this Bid Item shall be made at the applicable Contract unit price bid per cubic yard of concrete as shown on the Bid Form. Payment shall represent full compensation for all labor, materials, and equipment for mixing, placing, forming and curing of the concrete and all incidentals necessary to complete the concrete work, ready for approval and acceptance by the County.

BID ITEM	DESCRIPTION	UNITS
59	Concrete Encasement	CY

BID ITEM – ENVIRONMENTAL COORDINATION

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum bid for coordination with the County's Environmental consultant on the project. Payment shall represent full compensation for management, providing access to the contaminated areas, providing samples as necessary, contractor's own personal protective equipment, and properly staging or storing contaminated materials as directed by the Environmental consultant. The County's Environmental consultant will be onsite during construction in the known contaminated areas. The County's Environmental consultant shall be responsible for all sampling, treatment, and disposal of contaminated soil and groundwater.

The County's Environmental Consultant shall provide the Contractor with necessary analytical reports to support the Contractor's NPDES permit application for discharge to offsite surface waters, as needed.

Contractor personnel conducting work shall be OSHA 40-hour HAZWOPER trained pursuant to 29CFR 1910.120. all work on the site to be conducted utilizing appropriate personnel protective equipment which shall include, at a minimum modified Level D. All certifications shall be submitted to the Environmental consultant prior to starting work.

BID ITEM	DESCRIPTION	UNITS
60,90	Environmental Coordination	LS

BID ITEM – CURB AND GUTTER REPLACEMENT

Payment for all work included in this Bid Item will be made at the applicable Contract unit price bid per linear foot for removal of existing curbing and for furnishing and placing curb and gutter as shown on the Drawings and listed on the Bid Form. Measurement will be per actual number of linear feet of curbing installed. Payment shall represent full compensation for removal of existing curb and all labor, material and equipment for compacting subgrade, forming, furnishing, placing the concrete, and finishing as specified and all incidentals necessary for completion of this Bid Item, ready for approval and acceptance by the County.

BID ITEM	DESCRIPTION	UNITS
89	Curb and Gutter Replacement	LF

BID ITEM – MANHOLE ABANDONMENT

Payment for all work included in this Bid Item shall be made at the applicable Contract unit price bid for each manhole abandonment as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation for all labor, material, excavation, including rock, bedding, backfill, compaction, testing and disinfection and equipment required to complete these Bid Items.

BID ITEM	DESCRIPTION	UNITS
91	Manhole Abandonment	EA

BID ITEM – PRECAST CONCRETE DOGHOUSE MANHOLE

Payment for work under this Bid Item shall be made at the Contract unit price bid for each doghouse manhole furnished and installed including frame and cover, connections, construction of invert, all protective coatings, drop connections, sealing of lift holes, and lining, within these Specifications.

Measurement shall be for each manhole installed complete and accepted. Payment shall be made per unit price for the category of depth as determined by the proposed rim and invert. All stubs and plugs shown or called for on the Contract Drawings shall be included in the unit price bid for manholes. Excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, testing and any and all other items necessary for a completed system in accordance with the Contract Documents shall be included. Payment shall represent full compensation for all labor, materials, equipment and incidental items necessary to complete each concrete manhole structure, ready for approval and service by the County.

BID ITEM	DESCRIPTION	UNITS
92	Doghouse Manhole	EA

BID ITEM – PERMIT ALLOWANCE

The County is allowing for a City of Anna Maria and City of Bradenton Beach Right-of-Way permitting allowance of $5,000. Contractor shall include this allowance in his bid. Payment will only be made for the actual Permit Fee. Contractor shall provide justification for payment at time of billing.

BID ITEM	DESCRIPTION	UNITS
93	Permitting Allowance	LS

BID ITEM – CONTRACT CONTINGENCY

Payment for all work under this Bid Item shall be made only at the County's discretion. This Bid Item shall not exceed 10% of the Bidders Total Base Bid. The Bidder shall calculate and enter a dollar amount for this Bid Item.

BID ITEM	DESCRIPTION	UNITS
94	Contract Contingency	LS

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01152

REQUESTS FOR PAYMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Submit Applications for Payment to the Project Manager or as directed at the preconstruction meeting, in accordance with the schedule established by Conditions of the Contract and Agreement between County and Contractor.

1.02 FORMAT AND DATA REQUIRED

A. Submit payment requests in the form provided by the County with itemized data typed in accordance with the Bid Form.

B. Provide construction photographs in accordance with Contract Documents.

1.03 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the County requires substantiating data, Contractor shall submit suitable information with a cover letter.

B. Submit one copy of data and cover letter for each copy of application.

1.04 PREPARATION OF APPLICATION FOR FINAL PAYMENT

Fill in application form as specified for progress payments.

1.05 SUBMITTAL PROCEDURE

A. Submit applications for payment at the times stipulated in the Agreement.

B. Number: Three (3) copies of each application; all signed and certified by the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01153

CHANGE ORDER PROCEDURES

PART 1 GENERAL

1.01 DEFINITION

A. Change Order: A written order signed by the Owner, the Architect/Engineer and the Contractor authorizing a change in the Project Plans and/or Specifications and, if necessary, a corresponding adjustment in the Contract Sum and/or Contract Time, pursuant to Article V of the General Conditions of the Construction Agreement.

B. Administrative Change Adjustment: Minor change order under 10% of project cost or 20% time, does not have to be Board approved.

C. Field Directive: A written order issued by Owner which orders minor changes in the Work not involving a change in Contract Time, to be paid from the Owner's contingency funds.

D. Field Order: Minor Change to contract work that does not require adjustment of contract sum or expected date of completion.

1.02 REQUIREMENTS INCLUDED

A. The Contractor shall promptly implement change order procedures:

1. Provide full written data required to evaluate changes.
2. Maintain detailed records of work done on a time-and-material/force account basis.
3. Provide full documentation to County on request.

B. The Contractor shall designate a member of the Contractor's organization who:

1. Is authorized to accept changes to the Work.
2. Is responsible for informing others in the Contractor's employ of the authorized changes into the Work.

1.03 PRELIMINARY PROCEDURES

A. Project Manager may initiate changes by submitting a Request to Contractor. Request will include:

1. Detailed description of the change, products, costs and location of the change in the Project.
2. Supplementary or revised Drawings and Specifications.
3. The projected time extension for making the change.
4. A specified period of time during which the requested price will be considered valid.
5. Such request is for information only and is not an instruction to execute the changes, nor to stop work in progress.

B. Contractor may initiate changes by submitting a written notice to the Project Manager, containing:

1. Description of the proposed changes.
2. Statement of the reason for making the changes.
3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the work of separate contractors.
5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.04 FIELD ORDER CHANGE

A. In lieu of a Change Order, the Project Manager may issue a Field Order for the Contractor to proceed with additional work within the original intent of the Project.

B. Field Order will describe changes in the work, with attachments of backup information to define details of the change.

C. Contractor must sign and date the Field Order to indicate agreement with the terms therein.

1.05 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump sum proposal and for each unit price which has not previously been established, with sufficient substantiating data to allow the County to evaluate the quotation.

B. On request, provide additional data to support time and cost computations:

1. Labor required.
2. Equipment required.
3. Products required.
    a. Recommended source of purchase and unit cost.
    b. Quantities required.
4. Taxes, insurance and bonds.
5. Credit for work deleted from Contract, similarly documented.
6. Overhead and profit.
7. Justification for any change in Contract Time.

C. Support each claim for additional costs and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal.

1. Name of the County's authorized agent who ordered the work and date of the order.
2. Date and time work was performed and by whom.
3. Time record, summary of hours work and hourly rates paid.
4. Receipts and invoices for:
    a. Equipment used, listing dates and time of use.
    b. Products used, listing of quantities.
    c. Subcontracts.

1.06 PREPARATION OF CHANGE ORDERS

A. Project Manager will prepare each Change Order.

B. Change Order will describe changes in the Work, both additions and deletions, with attachments as necessary to define details of the change.

C. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

1.07 LUMP SUM/FIXED PRICE CHANGE ORDER

A. Project Manager initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by the Contractor, or requests from the County, or both.

B. Once the form has been completed, all copies should be sent to Contractor for approval. After approval by Contractor, all copies should be sent to County for approval. The County will distribute executed copies after approval by the Board of County Commissioners.

1.08 UNIT PRICE CHANGE ORDER

A. Contents of Change Orders will be based on, either:

1. County's definition of the scope of the required changes.
2. Contractor's Proposal for a change, as approved by the County.
3. Survey of completed work.

B. The amounts of the unit prices to be:

1. Those stated in the Agreement.
2. Those mutually agreed upon between County and Contractor.

1.09 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/CONSTRUCTION CHANGE AUTHORIZATION

A. Refer to Article V.5.6 of the General Conditions of the Construction Agreement.

1.10 CORRELATION WITH CONTRACTOR'S SUBMITTALS

A. Periodically revise Schedule of Values and Application for Payment forms to record each change as a separate item of work, and to record the adjusted Contract Sum.

B. Periodically revise the Construction Schedule to reflect each change in Contract Time. Revise sub schedules to show changes for other items of work affected by the changes.

C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The County shall schedule the pre-construction meeting, periodic progress meetings and special meetings, if required, throughout progress of work.

B. Representatives of contractors, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. The Contractor shall attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.02 PRE-CONSTRUCTION MEETING

A. Attendance:

1. County's Engineer.
2. County's Project Manager
3. Contractor.
4. Resident Project Representative.
5. Related Labor Contractor's Superintendent.
6. Major Subcontractors.
7. Major Suppliers.
8. Others as appropriate.

B. Suggested Agenda:

1. Distribution and discussion of:
    a. List of major subcontractors.
    b. Projected Construction Schedules.
    c. Coordination of Utilities
2. Critical work sequencing.
3. Project Coordination.
    a. Designation of responsible personnel.
    b. Emergency contact persons with phone numbers.
4. Procedures and processing of:
    a. Field decisions.
    b. Submittals.
    c. Change Orders.
    d. Applications for Payment.
5. Procedures for maintaining Record Documents.
6. Use of premises:
    a. Office, work and storage areas.
    b. County's REQUIREMENTS.

7. Temporary utilities.
8. Housekeeping procedures.
9. Liquidated damages.
10. Equal Opportunity Requirements.
11. Laboratory testing.
12. Project / Job meetings: Progress meeting, other special topics as needed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULE & PROJECT RESTRAINTS

PART 1 GENERAL

1.01 GENERAL

A. Construction under this contract must be coordinated with the County and accomplished in a logical order to maintain utilization and flow through existing facilities and public properties and rights-of-way and to allow construction to be completed within the time allowed by Contract Documents and in the manner set forth in the Contract.

1.02 CONSTRUCTION SCHEDULING GENERAL PROVISIONS

A. No work shall be done between 7:00 p.m. and 7:00 a.m. nor on weekends or legal holidays without written permission of the County. However, emergency work may be done without prior permission.

B. Night work may be established by the Contractor as regular procedure with the written permission of the County. Such permission, however, may be revoked at any time by the County if the Contractor fails to maintain adequate equipment and supervision for the proper execution and control of the work at night.

C. Due to potential health hazards and requirements of the State of Florida and the U.S. Environmental Protection Agency, existing facilities must be maintained in operation.

D. The Contractor shall be fully responsible for providing all temporary piping, plumbing, electrical hook-ups, lighting, temporary structure, or other materials, equipment and systems required to maintain the existing facility's operations. All details of temporary piping and temporary construction are not necessarily shown on the Drawings or covered in the Specifications. However, this does not relieve the Contractor of the responsibility to ensure that construction will not interrupt proper facility operations.

E. The Contractor shall designate an authorized representative of his firm who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the Contractor shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the commitments of the Contractor's schedule.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. The Contractor shall submit a critical path schedule as described herein.

B. The planning, scheduling, management and execution of the work is the sole responsibility of the Contractor. The progress schedule requirement is established to allow County to review Contractor's planning, scheduling, management and execution of the work; to assist County in evaluating work progress and make progress payments and to allow other contractors to cooperate and coordinate their activities with those of the Contractor.

2.02 FORM OF SCHEDULES

A. Prepare schedules using the latest version of Microsoft Project, or other County approved software, in the form of a horizontal bar chart diagram. The diagram shall be time-scaled and sequenced by work areas. Horizontal time scale shall identify the first work day of each week.

B. Activities shall be at least as detailed as the Schedule of Values. Activity durations shall be in whole working days. In addition, man-days shall be shown for each activity or tabulated in an accompanying report.

C. Diagrams shall be neat and legible and submitted on sheets at least 8-1/2 inches by 11 inches suitable for reproduction. Scale and spacing shall allow space for notations and future revisions.

2.03 CONTENT OF SCHEDULES

A. Each monthly schedule shall be based on data as of the last day of the current pay period.

B. Description for each activity shall be brief, but convey the scope of work described.

C. Activities shall identify all items of work that must be accomplished to achieve substantial completion, such as items pertaining to Contractor's installation and testing activities; items pertaining to the approval of regulatory agencies; contractor's time required for submittals, fabrication and deliveries; the time required by County to review all submittals as set forth in the Contract Documents; items of work required of County to support pre-operational, startup and final testing; time required for the relocation of utilities. Activities shall also identify interface milestones with the work of other contractors performing work under separate contracts with County.

D. Schedules shall show the complete sequence of construction by activities. Dates for beginning and completion of each activity shall be indicated as well as projected percentage of completion for each activity as of the first day of each month.

E. Submittal schedule for shop drawing review, product data, and samples shall show the date of Contractor submittal and the date approved submittals will be required by the County, consistent with the time frames established in the Specifications.

F. For Contract change orders granting time extensions, the impact on the Contract date(s) shall equal the calendar-day total time extension specified for the applicable work in the Contract change orders.

G. For actual delays, add activities prior to each delayed activity on the appropriate critical path(s). Data on the added activities of this type shall portray all steps leading to the delay and shall further include the following: separate activity identification, activity description indicating cause of the delay, activity duration consistent with whichever set of dates below applies, the actual start and finish dates of the delay or, if the delay is not finished, the actual start date and estimated completion date.

H. For potential delays, add an activity prior to each potentially delayed activity on the appropriate critical path(s). Data for added activities of this type shall include alternatives available to mitigate the delay including acceleration alternatives and further show the following: separate activity identification, activity description indicating cause of the potential delay and activity duration equal to zero work days.

2.04 SUPPORTING NARRATIVE

A. Status and scheduling reports identified below shall contain a narrative to document the project status, to explain the basis of Contractor's determination of durations, describe the Contract conditions and restraints incorporated into the schedule and provide an analysis pertaining to potential problems and practical steps to mitigate them.

B. The narrative shall specifically include:

1. Actual completion dates for activities completed during the monthly report period and actual start dates for activities commenced during the monthly report period.
2. Anticipated start dates for activities scheduled to commence during the following monthly report period.
3. Changes in the duration of any activity and minor logic changes.
4. The progress along the critical path in terms of days ahead or behind the Contract date.
5. If the Monthly Status Report indicates an avoidable delay to the Contract completion date or interim completion dates as specified in the Agreement, Contractor shall identify the problem, cause and the activities affected and provide an explanation of the proposed corrective action to meet the milestone dates involved or to mitigate further delays.
6. If the delay is thought to be unavoidable, the Contractor shall identify the problem, cause, duration, specific activities affected and restraints of each activity.
7. The narrative shall also discuss all change order activities whether included or not in the revised/current schedule of legal status. Newly introduced change order work activities and the CPM path(s) that they affect, must be specifically identified. All change order work activities added to the schedule shall conform with the sequencing and Contract Time requirements of the applicable Change Order.
8. Original Contract date(s) shall not be changed except by Contract change order. A revision need not be submitted when the foregoing situations arise unless required by County. Review of a report containing added activities will not be construed to be concurrence with the duration or restraints for such added activities; instead the corresponding data as ultimately incorporated into the applicable Contract change order shall govern.
9. Should County require additional data, this information shall be supplied by Contractor within 10 calendar days.

2.05 SUBMITTALS

A. Contractor shall submit estimated and preliminary progress schedules (as identified in the Terms and Conditions of the Contract and the General Conditions), monthly status reports, a start-up schedule and an as-built schedule report all as specified herein.

B. All schedules, including estimated and preliminary schedules, shall be in conformance with the Contract Documents.

C. The finalized progress schedule discussed in the Contract Documents shall be the first monthly status report and as such shall be in conformance with all applicable specifications contained herein.

D. Monthly Status Report submittals shall include a time-scaled (days after notice to proceed) diagram showing all contract activities and supporting narrative. The initial detailed schedule shall use the notice to proceed as the start date. The finalized schedule, if concurred with by County, shall be the work plan to be used by the contractor for planning, scheduling, managing and executing the work.

E. The schedule diagram shall be formatted as above. The diagram shall include (1) all detailed activities included in the preliminary and estimated schedule submittals, (2) calendar days prior to substantial completion, (3) summary activities for the remaining days. The critical path activities shall be identified, including critical paths for interim dates, if possible.

F. The Contractor shall submit progress schedules with each application for payment.

2.06 MONTHLY STATUS REPORTS

A. Contractor shall submit detailed schedule status reports on a monthly basis with the Application for Payment. The first such status report shall be submitted with the first Application for Payment and include data as of the last day of the pay period. The Monthly Report shall include a "marked-up" copy of the latest detailed schedule of legal status and a supporting narrative including updated information as described above. The Monthly Report will be reviewed by County and Contractor at a monthly schedule meeting and Contractor will address County's comments on the subsequent monthly report. Monthly status reports shall be the basis for evaluating Contractor's progress.

B. The "marked-up" diagram shall show, for the latest detailed schedule of legal status, percentages of completion for all activities, actual start and finish dates and remaining durations, as appropriate. Activities not previously included in the latest detailed schedule of legal status shall be added, except that contractual dates will not be changed except by change order. Review of a marked-up diagram by County will not be construed to constitute concurrence with the time frames, duration, or sequencing for such added activities; instead the corresponding data as ultimately incorporated into an appropriate change order shall govern.

2.07 STARTUP SCHEDULE

A. At least 60 calendar days prior to the date of substantial completion, Contractor shall submit a time-scaled (days after notice to proceed) diagram detailing the work to take place in the period between 60 days prior to substantial completion, together with a supporting narrative. County shall have 10 calendar days after receipt of the submittal to respond. Upon receipt of County's comments, Contractor shall make the necessary revisions and submit the revised schedule within 10 calendar days. The resubmittal, if concurred with by County, shall be the Work Plan to be used by Contractor for planning, managing, scheduling and executing the remaining work leading to substantial completion.

B. The time-scaled diagram shall use the latest schedule of legal status for those activities completed ahead of the last 60 calendar days prior to substantial completion and detailed activities for the remaining 60-day period within the time frames outlined in the latest schedule of legal status.

C. Contractor will be required to continue the requirement for monthly reports, as outlined above. In preparing this report, Contractor must assure that the schedule is consistent with the progress noted in the startup schedule.

2.08 REVISIONS

A. All revised Schedule Submittals shall be made in the same form and detail as the initial submittal and shall be accompanied by an explanation of the reasons for such revisions, all of which shall be subject to review and concurrence by County. The revision shall incorporate all previously made changes to reflect current as-built conditions. Minor changes to the approved submittal may be approved at monthly meetings; a minor change is not considered a revision in the context of this paragraph.

B. A revised schedule submittal shall be submitted for review when required by County.

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01340

SHOP DRAWINGS, PROJECT DATA AND SAMPLES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall submit to the County for review and approval: working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this section called data), and material samples (hereinafter in this section called samples) as are required for the proper control of work, including, but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.

B. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the County. This log should include the following items:

1. Submittal description and number assigned.
2. Date to County.
3. Date returned to Contractor (from County).
4. Status of Submittal (No exceptions taken, returned for confirmation or resubmittal, rejected).
5. Date of Resubmittal and Return (as applicable).
6. Date material released (for fabrication).
7. Projected date of fabrication.
8. Projected date of delivery to site.
9. Projected date and required lead time so that product installation does not delay contact.
10. Status of O&M manuals submitted.

1.03 CONTRACTOR'S RESPONSIBILITY

A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the County 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 County without the Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the contract Documents.

B. Determine and verify:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with Specifications and indicate all variances from the Specifications.

C. The Contractor shall furnish the County a schedule of Shop Drawing submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.

D. The Contractor shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the County, with No Exceptions Taken or Approved as Noted.

E. The Contractor shall submit to the County all drawings and schedules sufficiently in advance of construction requirements to provide no less than twenty-one (21) calendar days for checking and appropriate action from the time the County receives them.

F. All material & product submittals, other than samples, may be transmitted electronically as a pdf file. All returns to the contractor will be as a pdf file only unless specifically requested otherwise.

G. The Contractor shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review by County of the necessary Shop Drawings.

1.04 COUNTY'S REVIEW OF SHOP DRAWINGS AND WORKING DRAWINGS

A. The County's review of drawings, data and samples submitted by the Contractor shall cover only general conformity to the Specifications, external connections and dimensions which affect the installation.

B. The review of drawings and schedules shall be general and shall not be construed:

1. As permitting any departure from the Contract requirements.
2. As relieving the Contractor of responsibility for any errors, including details, dimensions and materials.
3. As approving departures from details furnished by the County, except as otherwise provided herein.

C. If the drawings or schedules as submitted describe variations and show a departure from the Contract requirements which the County finds to be in the interest of the County and to be so minor as not to involve a change in Contract Price or time for performance, the County may return the reviewed drawings without noting any exception.

D. When reviewed by the County, each of the Shop and Working Drawings shall be identified as having received such review being so stamped and dated. Shop Drawings stamped "REJECTED" and with required corrections shown shall be returned to the Contractor for correction and resubmittal.

E. Resubmittals will be handled in the same manner as first submittals. On resubmittals, the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the County on previous submissions. The Contractor shall make any corrections required by the County.

F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the County.

G. The County shall review a submittal/resubmittal a maximum of three (3) times after which cost of review shall be borne by the Contractor. The cost of engineering shall be equal to the County's actual payroll cost.

H. When the Shop and Working Drawings have been completed to the satisfaction of the County, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the County.

I. No partial submittals shall be reviewed. Incomplete submittals shall be returned to the Contractor and shall be considered not approved until resubmitted.

1.05 SHOP DRAWINGS

A. When used in the Contract Documents, the term "Shop Drawings" shall be considered to mean Contractor's plans for material and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop Drawings shall consist of fabrication, drawings, setting drawings, schedule drawings, manufacturer's scale drawings and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature and performance and test data, shall be considered only as supportive to required Shop Drawings as defined above.

B. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the County and shall bear the Contractor's stamp of approval and original signature as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval and original signature shall be returned to the Contractor for resubmission.

C. Each Shop Drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:

1. Number and title of the drawing.
2. Date of Drawing or revision.
3. Name of project building or facility.
4. Name of contractor and subcontractor submitting drawing.
5. Clear identification of contents and location of the work.
6. Specification title and number.

D. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the contract shall be implemented where appropriate. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility of executing the work in accordance with the Contract, even though such drawings have been reviewed.

E. Data on materials and equipment shall include, without limitation, materials and equipment lists, catalog sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.

F. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

G. All manufacturers or equipment suppliers who proposed to furnish equipment or products shall submit an installation list to the County along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and have been in operation for a period of at least one (1) year.

H. Only the County will utilize the color "red" in marking shop drawing submittals.

1.06 WORKING DRAWINGS

A. When used in the Contract Documents, the term "working drawings" shall be considered to mean the Contractor's fabrication and erection drawings for structures such as roof trusses, steelwork, precast concrete elements, bulkheads, support of open cut excavation, support of utilities, groundwater control systems, forming and false work; underpinning; and for such other work as may be required for construction of the project.

B. Copies of working drawings as noted above, shall be submitted to the County where required by the Contract Documents or requested by the County and shall be submitted at least thirty (30) days (unless otherwise specified by the County) in advance of their being required for 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. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the County, which review will be for general conformance and will not relieve the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the Contractor; the County and Engineer shall not have responsibility therefor.

1.07 SAMPLES

A. The Contractor shall furnish, for the review of the County, samples required by the Contract Documents or requested by the County. Samples shall be delivered to the County as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until reviewed by the County.

B. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.
3. A minimum of two samples of each item shall be submitted.

C. Each sample shall have a label indicating:

1. Name of product.
2. Name of Contractor and Subcontractor.
3. Material or equipment represented.
4. Place of origin.
5. Name of Producer and Brand (if any).
6. Location in project.
   (Samples of finished materials shall have additional markings that will identify them under the finished schedules.)
7. Reference specification paragraph.

D. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the County. Review of a sample shall be only for the characteristics or use named in such and shall not be construed to change or modify any Contract requirements.

E. Reviewed samples not destroyed in testing shall be sent to the County or stored at the site of the work. Reviewed samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the reviewed samples. If requested at the time of submission, samples which failed testing or were rejected shall be returned to the Contractor at his expense.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01370

SCHEDULE OF VALUES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall submit to the County a Schedule of Values allocated to the various portions of the work, within 10 days after date of Notice to Proceed.

B. Upon request of the County, the Contractor shall support the values with data which will substantiate their correctness.

C. The Schedule of Values shall be used only as the basis for the Contractor's Applications for Payment.

1.02 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Schedule of Values will be considered for approval by County upon Contractor's request. Identify schedule with:

1. Title of Project and location.
2. Project number.
3. Name and address of Contractor.
4. Contract designation.
5. Date of submission.

B. Schedule of Values shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.

C. Follow the table of contents for the Contract Document as the format for listing component items for structures:

1. Identify each line item with the number and title of the respective major section of the specification.
2. For each line item, list sub values of major products or operations under item.

D. Follow the bid sheets included in this Contract Documents as the format for listing component items for pipe lines.

E. The sum of all values listed in the schedule shall equal the total Contract sum.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01380

CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall employ a competent photographer to take construction record photographs or perform video, recording including furnishing all labor, materials, equipment and incidentals necessary to obtain photographs and/or video recordings of all construction areas.

B. Preconstruction record information shall consist of video recordings on digital video disks (DVD).

C. Construction progress information shall consist of photographs and digital photographs on a recordable compact disc (CD-R).

1.02 QUALIFICATIONS

A. All photography shall be done by a competent camera operator who is fully experienced and qualified with the specified equipment.

B. For the video recording, the audio portion should be done by a person qualified and knowledgeable in the specifics of the Contract, who shall speak with clarity and diction so as to be easily understood.

1.03 PROJECT PHOTOGRAPHS

A. Provide one print of each photograph with each pay application.

B. Provide one recordable compact disc with digital photographs with each pay application.

C. Negatives:

1. All negatives shall remain the property of photographer.
2. The Contractor shall require that photographer maintain negatives or protected digital files for a period of two years from date of substantial completion of the project.
3. Photographer shall agree to furnish additional prints to County at commercial rates applicable at time of purchase. Photographer shall also agree to participate as required in any litigation requiring the photographer as an expert witness.

D. The Contractor shall pay all costs associated with the required photography and prints. Any parties requiring additional photography or prints shall pay the photographer directly.

E. All project photographs shall be a single weight, color image. All finishes shall be smooth surface and glossy and all prints shall be 8 inches x 10 inches.

F. Each print shall have clearly marked on the back, the name of the project, the orientation of view, the date and time of exposure, name and address of the photographer and the photographers numbered identification of exposure.

G. All project photographs shall be taken from locations to adequately illustrate conditions prior to construction, or conditions of construction and state of progress. The Contractor shall consult with the County at each period of photography for instructions concerning views required.

1.04 VIDEO RECORDINGS

A. Video, recording shall be done along all routes that are scheduled for construction. Video, recording shall include full, recording of both sides of all streets and the entire width of easements plus 10 feet on each side on which construction is to be performed. All video recording shall be in full color.

B. A complete view, in sufficient detail with audio description of the exact location shall be provided.

C. The engineering plans shall be used as a reference for stationing in the audio portion of the recordings for easy location identification.

D. Two complete sets of video recordings shall be delivered to the County on digital video disks (DVD) for the permanent and exclusive use of the County prior to the start of any construction on the project.

E. All video recordings shall contain the name of the project, the date and time of the video, recording, the name and address of the photographer and any other identifying information required.

F. Construction shall not start until preconstruction video recordings are completed, submitted and accepted by the County. In addition, no progress payments shall be made until the preconstruction video recordings are accepted by the County.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01410

TESTING AND TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED- PORT MANATEE

A. The County has retained PSI, Inc. to provide soil and groundwater testing services as may be required. Soil and groundwater data, collected within the proposed force main alignment is incorporated into these specifications and shall be used by the Contractor as site data for submittal of the NPDES Permit. In addition, a Free Product Assessment Report, performed on the TransMontaigne Terminal in close proximity to the work area is also included.

B. The northern portion of the alignment (approximately station 411+00) is known to exhibit extensive groundwater and soil contamination from petroleum constituents. In addition, hydrogen sulfide gas and petroleum free product has been detected in shallow soils in the area of station 411+00. Groundwater at all locations contains arsenic in excess of the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels. Arsenic in soils at all locations exceed the FDEP Soil Cleanup Target Level-Residential. Elevated levels of petroleum constituents as measured by an Organic Vapor Analyzer (OVA) exceed the 10 part per million screening level established by the FDEP at all tested locations.

C. PSI will be responsible for managing contaminated drilling fluids, dewatering effluent and excess contaminated soils as may be encountered due to the presence of these contaminants.

D. The contractor is to coordinate all schedules with PSI and provide a location for storage of contaminated materials and/or setup of groundwater treatment equipment.

E. Contractor to coordinate dewatering activities with PSI. Contractor to provide PSI with an estimated dewatering rate at the pre-construction meeting.

F. Should environmental contamination be observed at other locations during construction, cease work in that area and notify the County.

REQUIREMENTS INCLUDED- ORLANDO AVENUE

1. The County has retained PSI, Inc. to provide soil and groundwater testing services as may be required. Soil and groundwater data, collected within the Orlando Avenue Right-of-Way is incorporated into these specifications and shall be used by the Contractor as site data for submittal of the NPDES Permit.
2. The northeast corner of Orlando Avenue and 14th Street W is known to have soil and groundwater contamination present from past use as a gasoline station. PSI will be responsible for managing soils and disposal of contaminated drilling fluids, dewatering effluent and contaminated soils as may be encountered due to the presence of these contaminants.

3. The contractor is to coordinate all schedules with PSI and provide a location for storage of contaminated materials and/or setup of groundwater treatment equipment.
4. Contractor to coordinate dewatering activities that may be required in the vicinity of Stations 100+90 with PSI to determine if a PSI supplied groundwater treatment system may be necessary. Contractor to provide PSI with an estimated dewatering rate at the pre-construction meeting.
5. Should environmental contamination be observed at other locations during construction, cease work in that area and notify the County.
6. Environmental consultant shall provide an on-site representative to test soils and drilling fluids for the possible presence of petroleum contamination, utilizing an organic vapor analyzer. If OVA readings indicate, consultant will advise Contractor of the presence of contaminated media and contractor will be responsible for segregating such wastes in a separate location. Consultant will arrange for testing and disposal.

1.02 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the Work.
3. Perform any duties of the Contractor, with the exception of testing treatment and/or disposal of contaminated drilling fluids, soils and groundwater.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel; provide access to Work and/or to Manufacturer's operations.

B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which require control by the testing laboratory.

D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The County may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor and no extra charge to the County shall be allowed on account of such testing and certification.

E. Furnish incidental labor and facilities:

1. To provide access to work to be tested.

2. To obtain and handle samples at the project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

1. When tests or inspections cannot be performed due to insufficient notice, Contractor shall reimburse County for laboratory personnel and travel expenses incurred due to Contractor's negligence.

G. Employ and pay for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required for the Contractor's convenience and as approved by the County.

G. If the test results indicate the material or equipment complies with the Contract Documents, the County shall pay for the cost of the testing laboratory. If the tests and any subsequent retests indicate the materials and equipment fail to meet the requirements of the Contract Documents, the contractor shall pay for the laboratory costs directly to the testing firm or the total of such costs shall be deducted from any payments due the Contractor.

FOR PORT MANATEE EXCLUSIVELY

I. PSI will provide an on-site environmental scientist to coordinate and manage waste disposal during project activities. All excavated soils must be placed on an impervious surface and underlain with a layer of 6 mil poly sheeting. Each day soil piles must be covered by 6 mil poly sheeting. Following completion of work in the excavation, soils may be returned to the excavation and covered with 6 mil poly sheeting until such time as site restoration occurs.

J. All excavation areas must be resurfaced with either concrete or asphalt as called out in these specifications. Excess soil, if any, shall be disposed of by PSI. Contractor to provide loading of roll-off container or waste hauling trucks as supplied by PSI.

K. Contractor to collect all drilling fluids and dispose of in waste container as provided by PSI. PSI will collect waste samples of drilling fluids and if contaminated will be responsible for disposal. If wastes do not exceed the appropriate FDEP standards, then the Contractor will be responsible for waste disposal. If responsibility of the Contractor, the wastes must be removed within one week following notification that waste disposal is the responsibility of the Contractor.

L. PSI will be responsible for treatment of dewatering system effluent. Based on information provided by the Contractor PSI will provide and operate a system designed to treat contaminants of concern. Contractor will discharge dewatering effluent to a PSI supplied frac tank. PSI will be responsible for treatment and discharge of effluent. Contractor will work with PSI to minimize dewatering volume and duration to minimize treatment costs.

M. Contractor will be expected to review and sign the PSI Health and Safety Plan. In the event

contaminated media is observed the Contractor will be expected to utilize appropriate Personal Protective Equipment (PPE) and avoid contact with such media.

FOR ORANGE AVENUE EXCLUSIVELY

1. The County has retained PSI, Inc. to provide soil and groundwater testing services as may be required. Soil and groundwater data, collected within the Orlando Avenue Right-of-Way is incorporated into these specifications and shall be used by the Contractor as site data for submittal of the NPDES Permit.
2. The northeast corner of Orlando Avenue and 14th Street W is known to have soil and groundwater contamination present from past use as a gasoline station. PSI will be responsible for managing soils and disposal of contaminated drilling fluids, dewatering effluent and contaminated soils as may be encountered due to the presence of these contaminants.
3. The contractor is to coordinate all schedules with PSI and provide a location for storage of contaminated materials and/or setup of groundwater treatment equipment.
4. Contractor to coordinate dewatering activities that may be required in the vicinity of Stations 100+90 with PSI to determine if a PSI supplied groundwater treatment system may be necessary. Contractor to provide PSI with an estimated dewatering rate at the pre-construction meeting.
5. Should environmental contamination be observed at other locations during construction, cease work in that area and notify the County.
6. Environmental consultant shall provide an on-site representative to test soils and drilling fluids for the possible presence of petroleum contamination, utilizing an organic vapor analyzer. If OVA readings indicate, consultant will advise Contractor of the presence of contaminated media and contractor will be responsible for segregating such wastes in a separate location. Consultant will arrange for testing and disposal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01510

TEMPORARY AND PERMANENT UTILITIES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

The Contractor shall be responsible for furnishing all requisite temporary utilities, i.e., power, water, sanitation, etc. The Contractor shall obtain and pay for all permits required as well as pay for all temporary usages. The Contractor shall remove all temporary facilities upon completion of work.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State and Local codes and regulations and with utility company requirements.

C. Comply with County Health Department regulations.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL

Materials for temporary utilities may be "used". Materials for electrical utilities shall be adequate in capacity for the required usage, shall not create unsafe conditions and shall not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

Arrange with the applicable utility company for temporary power supply. Provide service required for temporary power and lighting and pay all costs for permits, service and for power used.

2.03 TEMPORARY WATER

A. The Contractor shall arrange with Manatee County Utilities Customer Service office to provide water for construction purposes, i.e., meter, pay all costs for installation, maintenance and removal, and service charges for water used.

B. The Contractor shall protect piping and fitting against freezing.

2.04 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide sanitary facilities in compliance with all laws and regulations.

B. The Contractor shall service, clean and maintain facilities and enclosures.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall maintain and operate systems to assure continuous service.

B. The Contractor shall modify and extend systems as work progress requires.

3.02 REMOVAL

A. The Contractor shall completely remove temporary materials and equipment when their use is no longer required.

B. The Contractor shall clean and repair damage caused by temporary installations or use of temporary facilities.

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall be responsible for providing safe and expeditious movement of traffic through construction zones. A construction zone is defined as the immediate areas of actual construction and all abutting areas which are used by the Contractor and which interfere with the driving or walking public.

B. The Contractor shall remove temporary equipment and facilities when no longer required, restore grounds to original or to specified conditions.

1.02 TRAFFIC CONTROL

A. The necessary traffic control shall include, but not be limited to, such items as proper construction warning signs, signals, lighting devices, markings, barricades, channelization and hand signaling devices. The Contractor shall be responsible for installation and maintenance of all devices and detour routes and signage for the duration of the construction period. The Contractor shall utilize the appropriate traffic plan from the FDOT Maintenance of Traffic Standards, Series 600 of the FDOT Roadway & Traffic Design Standards, Latest Edition.

B. Should there be the necessity to close any portion of a roadway carrying vehicles or pedestrians the Contractor shall submit a Traffic Control Plan (TCP) at least 5 days before a partial or full day closure, and at least 8 days before a multi-day closure. TCP shall be submitted, along with a copy of their accreditation, by a certified IMSA or ATSA Traffic Control Specialist.

1. At no time will more than one (1) lane of a roadway be closed to vehicles and pedestrians without an approved road closure from the County Transportation Department. With any such closings, adequate provision shall be made for the safe expeditious movement of each.
2. All traffic control signs must be in place and inspected at least 1 day in advance of the closure. Multi-day closures notification signs shall be in place at least 3 days in advance of the closure. All signs must be covered when no in effect, and checked twice a day by the Worksite Traffic Supervisor when they are in effect.

C. The Contractor shall be responsible for removal, relocation, or replacement of any traffic control device in the construction area which exists as part of the normal preconstruction traffic control scheme. Any such actions shall be performed by the Contractor under the supervision and in accordance with the instructions of the applicable highway department unless otherwise specified.

D. The Contractor will consult with the County immediately on any vehicular or pedestrian safety or efficiency problem incurred as a result of construction of the project.

E. The Contractor shall provide ready access to businesses and homes in the project area during construction. The Contractor shall be responsible for coordinating this work with affected homeowners.

F. When conditions require the temporary installation of signs, pavement markings and traffic barriers for the protection or workers and traffic, the entire array of such devices shall be depicted on working drawings for each separate stage of work. These drawings shall be submitted to the County for review and approval prior to commencement of work on the site.

G. Precast concrete traffic barriers shall be placed adjacent to trenches and other excavations deeper than six inches below the adjacent pavement surface.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01580

PROJECT IDENTIFICATION AND SIGNS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install and maintain County project identification signs.

B. Remove signs on completion of construction.

C. Allow no other signs to be displayed except for traffic control and safety.

1.02 PROJECT IDENTIFICATION SIGN (COUNTY)

A. Two painted sign, of not less than 32 square feet (3 square meters) area, with painted graphic content to include:

1. Title of Project.
2. Name of County.
3. Names and titles of authorities as directed by County.
4. Prime Contractor.

B. Graphic design, style of lettering and colors: As approved by the County.

C. Erect on the site at a lighted location of high public visibility, adjacent to main entrance to site, as approved by the County

1.03 INFORMATIONAL SIGNS

A. Painted signs with painted lettering, or standard products.

1. Size of signs and lettering: as required by regulatory agencies, or as appropriate to usage.
2. Colors: as required by regulatory agencies, otherwise of uniform colors throughout project.

B. Erect at appropriate locations to provide required information.

1.04 QUALITY ASSURANCE

A. Sign Painter: Professional experience in type of work required.

B. Finishes, Painting: Adequate to resist weathering and fading for scheduled construction period.

1.05 PUBLIC NOTIFICATION

A. Door Hangers: The Contractor shall generate and distribute door hangers to all residents who will be impacted by project construction.

1. Residents impacted include anyone who resides inside, or within 500 feet of project limits of construction.

B. Door Hangers shall be distributed prior to start of construction of the project. Hangers shall be affixed to doors of residents via elastic bands or tape.

EXAMPLE:

PLEASE PARDON THE INCONVENIENCE WHILE THE ROADWAY IS BEING RECONSTRUCTED IN YOUR NEIGHBORHOOD

This project consists of utility improvements and the reconstruction of ??? Boulevard from U.S. ??? to ??? Street West. The project is expected to begin in August, 200X and be completed in July 200X.

Location Map

WE HOPE TO KEEP ANY INCONVENIENCE TO A MINIMUM. HOWEVER, IF YOU HAVE ANY PROBLEMS, PLEASE CONTACT THE FOLLOWING:

A. Contractor
Contractor Address
Contractor Phone (Site Phone)

Project Manager
PM Address
PM Phone No. & Ext.

B. Project Inspector
Inspector Phone Number

AFTER HOURS EMERGENCY NUMBER – (941) 747-HELP
THANK YOU FOR YOUR UNDERSTANDING AND PATIENCE
MANATEE COUNTY GOVERNMENT – PROJECT MANAGEMENT DEPT.

PART 2 PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: May be new or used, wood or metal, in sound condition structurally adequate to work and suitable for specified finish.

B. Sign Surfaces: Exterior softwood plywood with medium density overlay, standard large sizes to minimize joints.

1. Thickness: As required by standards to span framing members, to provide even, smooth surface without waves or buckles.

C. Rough Hardware: Galvanized.

D. Paint: Exterior quality, as specified in the Contract Documents.

PART 3 EXECUTION

3.01 PROJECT IDENTIFICATION SIGN

A. Paint exposed surface or supports, framing and surface material; one coat of primer and one coat of exterior paint.

B. Paint graphics in styles, size and colors selected.

3.02 MAINTENANCE

The Contractor shall maintain signs and supports in a neat, clean condition; repair damages to structures, framing or sign.

3.03 REMOVAL

The Contractor shall remove signs, framing, supports and foundations at completion of project.

END OF SECTION

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SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Material and equipment incorporated into the work:

1. Conform to applicable specifications and standards.
2. Comply with size, make, type and quality specified, or as specifically approved in writing by the County.
3. Manufactured and Fabricated Products:
   a. Design, fabricate and assemble in accordance with the best engineering and shop practices.
   b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
   c. Two or more items of the same kind shall be identical and manufactured by the same manufacturer.
   d. Products shall be suitable for service conditions.
   e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
4. Do not use material or equipment for any purpose other than that for which it is specified.
5. All material and equipment incorporated into the project shall be new.

1.02 MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to County. Maintain one set of complete instructions at the job site during installation and until completion.

B. Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with County prior to proceeding. Do not proceed with work without clear instructions.

1.03 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals and that products are properly protected and undamaged.

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.04 SUBSTITUTIONS AND PRODUCT OPTIONS

Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.
2. For products specified by naming one or more products or manufacturers and "or equal", Contractor must submit a request for substitutions of any product or manufacturer not specifically named in a timely manner so as not to adversely affect the construction schedule.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01620

STORAGE AND PROTECTION

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Provide secure storage and protection for products to be incorporated into the work and maintenance and protection for products after installation and until completion of Work.

1.02 STORAGE

A. Store products immediately on delivery and protect until installed in the Work, in accord with manufacturer's instructions, with seals and labels intact and legible.

B. Exterior Storage

1. Provide substantial platform, blocking or skids to support fabricated products above ground to prevent soiling or staining.
   a. Cover products, subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Provide adequate ventilation to avoid condensation.
   b. Prevent mixing of refuse or chemically injurious materials or liquids.

C. Arrange storage in manner to provide easy access for inspection.

1.03 MAINTENANCE OF STORAGE

A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:

1. State of storage facilities is adequate to provide required conditions.
2. Required environmental conditions are maintained on continuing basis.
3. Surfaces of products exposed to elements are not adversely affected. Any weathering of products, coatings and finishes is not acceptable under requirements of these Contract Documents.

B. Mechanical and electrical equipment which requires servicing during long term storage shall have complete manufacturer's instructions for servicing accompanying each item, with notice of enclosed instructions shown on exterior of package.

1. Equipment shall not be shipped until approved by the County. The intent of this requirement is to reduce on-site storage time prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the County.
2. All equipment having moving parts such as gears, electric motors, etc. and/or instruments shall be stored in a temperature and humidity controlled building approved by the County until such time as the equipment is to be installed.

3. All equipment shall be stored fully lubricated with oil, grease, etc. unless otherwise instructed by the manufacturer.
4. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half load, once weekly for an adequate period of time to insure that the equipment does not deteriorate from lack of use.
5. Lubricants shall be changed upon completion of installation and as frequently as required, thereafter during the period between installation and acceptance.
6. Prior to acceptance of the equipment, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guaranty the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

1.04 PROTECTION AFTER INSTALLATION

A. Provide protection of installed products to prevent damage from subsequent operations. Remove when no longer needed, prior to completion of work.

B. Control traffic to prevent damage to equipment and surfaces.

C. Provide coverings to protect finished surfaces from damage.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Comply with requirements stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the work.

1.02 SUBSTANTIAL COMPLETION

A. The Contractor shall submit the following items when the Contractor considers the work to be substantially complete:

1. A written notice that the work, or designated portion thereof, is substantially complete.
2. A list of items to be completed or corrected.

B. Within a reasonable time after receipt of such notice, the County shall make an inspection to determine the status of completion.

C. Project record documents and operations and maintenance manuals must be submitted before the project shall be considered substantially complete.

D. If the County determines that the work is not substantially complete:

1. The County shall notify the Contractor in writing, stating the reasons.
2. The Contractor shall remedy the deficiencies in the work and send a second written notice of substantial completion to the County.
3. The County shall reinspect the work.

E. When the County finds that the work is substantially complete:

1. The Engineer shall prepare and deliver to the County a tentative Certificate of Substantial Completion (Manatee County Project Management Form PMD-8) with a tentative list of the items to be completed or corrected before final payment.
2. The Engineer shall consider any objections made by the County as provided in Conditions of the Contract. When the Engineer considers the work substantially complete, he will execute and deliver to the County a definite Certificate of Substantial Completion (Manatee County Project Management Form PMD-8) with a revised tentative list of items to be completed or corrected.

1.03 FINAL INSPECTION

A. When the Contractor considered the work to be complete, he shall submit written certification stating that:

1. The Contract Documents have been reviewed.
2. The work has been inspected for compliance with Contract Documents.
3. The work has been completed in accordance with Contract Documents.
4. The equipment and systems have been tested in the presence of the County's representative and are operational.
5. The work is completed and ready for final inspection.

B. The County shall make an inspection to verify the status of completion after receipt of such certification.

C. If the County determines that the work is incomplete or defective:

1. The County shall promptly notify the Contractor in writing, listing the incomplete or defective work.
2. The Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to County that the work is complete.
3. The County shall reinspect the work.

D. Upon finding the work to be acceptable under the Contract Documents, the County shall request the Contractor to make closeout submittals.

E. For each additional inspection beyond a total of three (3) inspections for substantial and final completion due to the incompleteness of the work, the Contractor shall reimburse the County's fees.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO COUNTY

A. Project Record Documents (prior to substantial completion).

B. Operation and maintenance manuals (prior to substantial completion).

C. Warranties and Bonds.

D. Evidence of Payment and Release of Liens: In accordance with requirements of General and Supplementary Conditions.

E. Certification letter from Florida Department of Transportation and Manatee County Department of Transportation, as applicable.

F. Certificate of Insurance for Products and Completed Operations.

G. Final Reconciliation, Warranty Period Declaration, and Contractor's Affidavit (Manatee County Project Management Form PMD-9).

1.05 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting to the County.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.
2. Additions and deductions resulting from:
   a. Previous Change Orders
   b. Unit Prices
   c. Penalties and Bonuses
   d. Deductions for Liquidated Damages
   e. Other Adjustments
3. Total Contract Sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

C. Project Management shall prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.06 FINAL APPLICATION FOR PAYMENT

Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01710

CLEANING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Execute cleaning during progress of the work and at completion of the work, as required by the General Conditions.

1.02 DISPOSAL REQUIREMENTS

Conduct cleaning and disposal operations to comply with all Federal, State and Local codes, ordinances, regulations and anti-pollution laws.

PART 2 PRODUCTS

2.01 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

A. Execute periodic cleaning to keep the work, the site and adjacent properties free from accumulation of waste materials, rubbish and wind-blown debris, resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

3.02 DUST CONTROL

A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

3.03 FINAL CLEANING

A. Employ skilled workmen for final cleaning.

B. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

C. Prior to final completion or County occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces and all work areas to verify that the entire work is clean.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Contractor shall maintain at the site for the County one record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. County's field orders or written instructions.
6. Approved shop drawings, working drawings and samples.
7. Field test records.
8. Construction photographs.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office apart from documents used for construction.

1. Provide files and racks for storage of documents.
2. Provide locked cabinet or secure storage space for storage of samples.

B. File documents and samples in accordance with CSI format.

C. Maintain documents in a clean, dry, legible, condition and in good order. Do not use record documents for construction purposes.

D. Make documents and samples available at all times for inspection by the County.

1.03 MARKING DEVICES

A. Provide felt tip marking pens for recording information in the color code designated by the County.

1.04 RECORDING

A. Label each document "PROJECT RECORD" in neat large printed letters.

B. Record information concurrently with construction progress.

C. Do not conceal any work until required information is recorded.

D. Drawings; Legibly mark to record actual construction:

1. All underground piping with elevations and dimensions. Changes to piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe material, class, etc. Locations of drainage ditches, swales, water lines and force mains shall be shown every 200 feet (measured along the centerline) or alternate lot lines, whichever is closer. Dimensions at these locations shall indicate distance from centerline of right-of-way to the facility.
2. Field changes of dimension and detail.
3. Changes made by Field Order or by Change Order.
4. Details not on original contract drawings.
5. Equipment and piping relocations.
6. Locations of all valves, fire hydrants, manholes, water and sewer services, water and force main fittings, underdrain cleanouts, catch basins, junction boxes and any other structures located in the right-of-way or easement, shall be located by elevation and by station and offset based on intersection P.I.'s and centerline of right-of-way. For facilities located on private roads, the dimensioning shall be from centerline of paving or another readily visible baseline.
7. Elevations shall be provided for all manhole rim and inverts; junction box rim and inverts; catch basin rim and inverts; and baffle, weir and invert elevations in control structures. Elevations shall also be provided at the PVI's and at every other lot line or 200 feet, whichever is less, of drainage swales and ditches. Bench marks and elevation datum shall be indicated.
8. Slopes for pipes and ditches shall be recalculated, based on actual field measured distances, elevations, pipe sizes, and type shown. Cross section of drainage ditches and swales shall be verified.
9. Centerline of roads shall be tied to right-of-way lines. Elevation of roadway centerline shall be given at PVI's and at all intersections.
10. Record drawings shall show bearings and distances for all right-of-way and easement lines, and property corners.
11. Sidewalks, fences and walls, if installed at the time of initial record drawing submittal, shall be located every 200 feet or alternate lot lines, whichever is closer. Dimensions shall include distance from the right-of-way line and the back of curb and lot line or easement line.
12. Sanitary sewer mainline wyes shall be located from the downstream manhole. These dimensions shall be provided by on-site inspections or televiewing of the sewer following installation.
13. Elevations shall be provided on the top of operating nuts for all water and force main valves.
14. Allowable tolerance shall be ± 6.0 inches for horizontal dimensions. Vertical dimensions such as the difference in elevations between manhole inverts shall have an allowable tolerance of ± 1/8 inch per 50 feet (or part thereof) of horizontal distance up to a maximum tolerance of ± 2 inch.
15. Properly prepared record drawings on mylar, together with two copies, shall be certified by a design professional (Engineer and/or Surveyor registered in the State of Florida), employed by the Contractor, and submitted to the County.

E. Specifications and Addenda; Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
2. Changes made by field order or by change order.

F. Shop Drawings (after final review and approval):

1. Five sets of record drawings for each process equipment, piping, electrical system and instrumentation system.

1.05 SUBMITTAL

A. Prior to substantial completion and prior to starting the bacteria testing of water lines, deliver signed and sealed Record Documents and Record Drawings to the County. These will be reviewed and verified by the inspector. If there are any required changes or additions, these shall be completed and the entire signed and sealed set resubmitted prior to final pay application.

B. The Contractor shall employ a Professional Engineer or Surveyor registered in the State of Florida to verify survey data and properly prepare record drawings. Record drawings shall be certified by the professional(s) (Engineer or Surveyor licensed in Florida), as stipulated by the Land Development Ordinance and submitted on signed and sealed paper drawings, signed and dated mylar drawings together with an AutoCAD version on a recordable compact disk (CD).

C. The CD shall contain media in AutoCad Version 2004 or later, or in any other CAD program compatible with AutoCad in DWG or DXF form. All fonts, line types, shape files or other pertinent information used in the drawing and not normally included in AutoCad shall be included on the media with a text file or attached noted as to its relevance and use.

D. Accompany submittal with transmittal letter, containing:

1. Date.
2. Project title and number.
3. Contractor's name and address.
4. Title and number of each Record Document.
5. Signature of Contractor or his authorized representative.

Note: The data required to properly prepare these record drawings shall be obtained at the site, at no cost to the County by the responsible design professional or his/her duly appointed representative. The appointed representative shall be a qualified employee of the responsible design professional or a qualified inspector retained by the responsible design professional on a project-by-project basis.

PART 2 STANDARDS

2.01 MINIMUM RECORD DRAWING STANDARDS FOR ALL RECORD DRAWINGS SUBMITTED TO MANATEE COUNTY

A. Record drawings shall be submitted to at least the level of detail in the contract documents. It is anticipated that the original contract documents shall serve as at least a background for all record information. Original drawings in CAD format may be requested of the County.

B. Drawings shall meet the criteria of paragraph 1.04 D above.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Compile product data and related information appropriate for County's maintenance and operation of products furnished under Contract.

Prepare operating and maintenance data as specified in this and as referenced in other pertinent sections of Specifications.

B. Instruct County's personnel in maintenance of products and equipment and systems.

C. Provide three (3) sets of operating and maintenance manuals for each piece of equipment provided within this Contract.

1.02 FORM OF SUBMITTALS

A. Prepare data in form of an instructional manual for use by County's personnel.

B. Format:

1. Size: 8-1/2 inch x 11 inch
2. Paper: 20 pound minimum, white, for typed pages
3. Text: Manufacturer's printed data or neatly typewritten
4. Drawings:
   a. Provide reinforced punched binder tab, bind in with text.
   b. Fold larger drawings to size of text pages.
5. Provide fly-leaf for each separate product or each piece of operating equipment.
   a. Provide typed description of product and major component parts of equipment.
   b. Provide indexed tabs.
6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
   a. Title of Project.
   b. Identity of separate structures as applicable.
   c. Identity of general subject matter covered in the manual.

C. Binders:

1. Commercial quality three-ring binders with durable and cleanable plastic covers.
2. Maximum ring size: 1 inch.
3. When multiple binders are used, correlate the data into related consistent groupings.

1.03 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit three copies of complete manual in final form.

B. Content for each unit of equipment and system, as appropriate:

1. Description of unit and component parts.
   a. Function, normal operating characteristics and limiting conditions.
   b. Performance curves, engineering data and tests.
   c. Complete nomenclature and commercial number of replaceable parts.
2. Operating Procedures:
   a. Start-up, break-in, routine and normal operating instructions.
   b. Regulation, control, stopping, shut-down and emergency instructions.
   c. Summer and winter operating instructions.
   d. Special operating instructions.
3. Maintenance Procedures:
   a. Routine operations.
   b. Guide to "trouble-shooting".
   c. Disassembly, repair and reassembly.
   d. Alignment, adjusting and checking.
4. Servicing and lubricating schedule.
   a. List of lubricants required.
5. Manufacturer's printed operating and maintenance instructions.
6. Description of sequence of operation by control manufacturer.
7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
   a. List of predicted parts subject to wear.
   b. Items recommended to be stocked as spare parts.
8. As installed control diagrams by controls manufacturer.
9. Each contractor's coordination drawings.
   a. As installed color coded piping diagrams.
10. Charts of valve tag numbers, with location and function of each valve.
11. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage.
12. Other data as required under pertinent sections of specifications.

C. Content, for each electric and electronic system, as appropriate:

1. Description of system and component parts.
   a. Function, normal operating characteristics and limiting conditions.
   b. Performance curves, engineering data and tests.
   c. Complete nomenclature and commercial number of replaceable parts.
2. Circuit directories of panelboards.
   a. Electrical service.
   b. Controls.
   c. Communications.
3. As-installed color coded wiring diagrams.

4. Operating procedures:
   a. Routine and normal operating instructions.
   b. Sequences required.
   c. Special operating instructions.
5. Maintenance procedures:
   a. Routine operations.
   b. Guide to "trouble-shooting".
   c. Disassembly, repair and reassembly.
   d. Adjustment and checking.
6. Manufacturer's printed operating and maintenance instructions.
7. List of original manufacture's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage.
8. Prepare and include additional data when the need for such data becomes apparent during instruction of County's personnel.

D. Prepare and include additional data when the need for such data becomes apparent during instruction on County's personnel.

E. Additional requirements for operating and maintenance data: Respective sections of Specifications.

1.04 SUBMITTAL SCHEDULE

A. Submit one copy of completed data in final form fifteen days prior to substantial completion.

1. Copy will be returned after substantial completion, with comments (if any).

B. Submit two copies of approved data in final form. Final acceptance will not be provided until the completed manual is received and approved.

1.05 INSTRUCTION OF COUNTY'S PERSONNEL

A. Prior to final inspection or acceptance, fully instruct County's designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems.

B. Operating and maintenance manual shall constitute the basis of instruction.

1. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Compile specified warranties and bonds.

B. Compile specified service and maintenance contracts.

C. Co-execute submittals when so specified.

D. Review submittals to verify compliance with Contract Documents.

E. Submit to County for review and transmittal.

1.02 SUBMITTAL REQUIREMENTS

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors.

B. Number of original signed copies required: Two each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service maintenance contract.
6. Provide information for County's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address and telephone number.

1.03 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:

1. Size 8-1/2 inch x 11 inch punched sheets for standard 3-ring binder. Fold larger sheets to fit into binders.

2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Title of Project.
   b. Name of Contractor.

C. Binders: Commercial quality, three-ring, with durable and cleanable plastic covers.

1.04 TIME OF SUBMITTALS

A. Make submittals within ten days after date of substantial completion and prior to final request for payment.

B. For items of work, where acceptance is delayed materially beyond date of substantial completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.05 SUBMITTALS REQUIRED

A. Submit warranties, bonds, service and maintenance contracts as specified in respective sections of Specifications.

B. Approval by the County of all documents required under this section is a pre-requisite to requesting a final inspection and final payment

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

DIVISION 2 SITE WORK

SECTION 02064

MODIFICATIONS TO EXISTING STRUCTURES, PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals required to modify, alter and/or convert existing structures as shown or specified and as required for the installation of piping, mechanical equipment and appurtenances. Existing piping and equipment shall be removed and dismantled as necessary for the performance of facility alterations in accordance with the requirements herein specified.

PART 2 PRODUCTS

A. Epoxy mortar shall be fiberglass fiber mixed with an epoxy filler.

B. Non-shrink grout shall be a sand-cement, non-metallic formulation, having a 28-day strength of 4,000 psi and 0.0 percent shrinkage per ASTM C1090.

C. Liners to be installed in existing manholes and wetwells shall be spray-applied, monolithic, reinforced urethane resin. Urethane resin-based manhole liner material shall be resistant to hydrogen sulfide gas, and other common contents found in a sanitary sewer environment.

D. Approved manhole and wet well liner products are Raven 405, SprayWall, Green Monster, or SpectraShield.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall cut, repair, reuse, excavate, demolish or otherwise remove parts of the existing structures or appurtenances, as indicated on the Contract Drawings, herein specified, or necessary to permit completion of the work under this Contract. The Contractor shall dispose of surplus materials resulting from the above work in an approved manner. The work shall include all necessary cutting and bending of reinforcing steel, structural steel, or miscellaneous metal work found embedded in the existing structures.

B. The Contractor shall dismantle and remove all existing equipment, piping, and other appurtenances required for the completion of the work. Where called for or required, the contractor shall cut existing pipelines for the purpose of making connections thereto. Anchor bolts for equipment and structural steel removed shall be cut off one inch below the concrete surface. Surface shall be finished as specified in the Contract Documents.

C. At the time that a new connection is made to an existing pipeline, additional new piping, extending to and including a new valve, shall be installed. Pipe restraint devices, if required, is part of the installation shall also be installed as directed by the County.

D. No existing structure, equipment, or appurtenance shall be shifted, cut, removed, or otherwise altered except with the express approval of and to the extent approved by the County.

E. When removing materials or portions of existing utility pipelines and/or structures or when making openings in walls and partitions, the Contractor shall take all precautions and use all necessary barriers and other protective devices so as not to damage the structures beyond the limits necessary for the new work, and not to damage the structures or contents by falling or flying debris. Unless otherwise permitted, line drilling will be required in cutting existing concrete.

F. Materials and equipment removed in the course of making alterations and additions shall remain the property of the County, except that items not salvageable, as determined by the County, shall become the property of the Contractor to be disposed of by him off the work site at his own place of disposal. Operating equipment shall be thoroughly cleaned, lubricated, and greased for protection during prolonged storage.

G. All alterations to existing utility pipes and structures shall be done at such time and in such manner as to comply with the approved time schedule. So far as possible before any part of the work is started, all tools, equipment, and materials shall be assembled and made ready so that the work can be completed without delay.

H. All workmanship and new materials involved in constructing the alterations shall conform to the General Specifications for the classes of work insofar as such specifications are applicable.

I. All cutting of existing concrete or other material to provide suitable bonding to new work shall be done in a manner to meet the requirements of the respective section of these Specifications covering the new work. When not covered, the work shall be carried on in the manner and to the extent directed by the Resident Project Representative.

J. Surfaces of seals visible in the completed work shall be made to match as nearly as possible the adjacent surfaces.

K. Non-shrink grout shall be used for setting wall castings, sleeves, leveling pump bases, doweling anchors into existing concrete and elsewhere as shown.

L. Where necessary or required for the purpose of making connections, the Contractor shall cut existing pipelines in a manner to provide an approved joint. Where required, he shall use flanges, or provide Dresser Couplings, all as required.

M. The Contractor shall provide flumes, hoses, piping and other related items to divert or provide suitable plugs, bulkheads, or other means to hold back the flow of water or other liquids, all as required in the performance of the work under this Contract.

N. Care shall be taken not to damage any part of existing buildings or foundations or outside structures.

3.02 CONNECTING TO EXISTING PIPING AND EQUIPMENT

The Contractor shall verify exact location, material, alignment, joint, etc. of existing piping and equipment prior to making the connections called out in the Drawings. The verifications shall be performed with adequate time to correct any potential alignment or other problems prior to the actual time of connection. A Manatee County representative must be present for all tie-ins for a visual inspection.

3.03 REMOVAL AND ABANDONMENT OF ASBESTOS CEMENT PIPE AND APPURTENANCES

A. All work associated with the removal or abandonment of existing asbestos cement pipe and appurtenances shall be performed by a licensed asbestos abatement contractor or subcontractor registered in the State of Florida. After removal of the facilities, all trenches shall be backfilled in accordance with the Contract Documents. The cost of disposing of the removed materials shall be borne by the Contractor.

B. The asbestos abatement contractor or subcontractor shall contact the appropriate regulatory agencies prior to removal or abandonment of any asbestos material and shall obtain all required permits and licenses and issue all required notices. The Contractor shall be responsible for all fees associated with permits, licenses and notices to the governing regulatory agencies. An asbestos manifest form must accompany each and every shipment of such pipe or pipe material waste to the Manatee County Lena Road Landfill. Prior to each shipment, a minimum of 24 hours notice to the Landfill field office (Phone #748-5543) is required.

C. All work associated with removal or abandonment of asbestos cement pipe and appurtenances shall be performed in accordance with the standards listed below and all other applicable local, State, or Federal standards.

1. Florida Administrative Code, Chapter 62-257, "Asbestos Program".
2. National Emission Standards Hazardous Air Pollution (NESHAP), 40 CFR, Part 61, Subpart M, latest revision.
3. Occupational Safety and Health Act, 29 CFR, 1910.1001 – Asbestos.
4. Title 40 CFR, Part 763, Asbestos.
5. Florida Statute Title XXXII, Chapter 469, Asbestos Abatement.

D. All asbestos cement nipples between tees and valves shall be replaced.

3.04 IN-PLACE GROUTING OF EXISTING PIPE

A. Where water and wastewater utility pipes are to be abandoned in place, they shall be filled with a sand/cement grout as specified herein. When such pipes are constructed with asbestos cement materials, the abandonment activities shall be performed by a licensed asbestos abatement contractor as specified in these Specifications.

B. Grout shall be injected within the pipe sections indicated on the Drawings. The ends of these sections shall be capped and/or plugged. The grouting program shall consist of pumping sand-cement grout with suitable chemical additives at pressures necessary to fill the pipe sections shown on the Drawings to prevent the potential for future collapse.

C. The pump used for grouting should be a continuous flow, positive displacement model with a pugmill type mixing vat having a minimum shaft speed of 60 rpm and incorporated as an integral part of the equipment. Alternate equipment may be used subject to the approval of the County. The rate of pumping shall not exceed six (6) cubic feet per minute. The pumping pressures shall be in the range of 100 to 150 psi.

D. The Contractor shall provide standpipes and/or additional means of visual inspection as required by the County to determine if adequate grout material has filled the entire pipe section(s). The Contractor shall make necessary provisions for the County's representative to monitor all grouting operations.

E. All pipe to be abandoned shall be capped or plugged with a fitting or material that will prevent soil or other material from entering the pipe. All caps and plugs shall be subject to approval by the County.

F. All tees, crosses, and valves left in service shall be plugged and restrained.

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers clearing, grubbing and stripping of the project site and/or along the pipeline route.

B. The Contractor shall clear and grub all of the area within the limits of construction or as required, which includes, but is not limited to utility easements. The width of the area to be cleared shall be reviewed by the County prior to the beginning of any clearing.

C. The Contractor's attention is directed to any Soil Erosion and Sediment Control Ordinances in force in Manatee County. The Contractor shall comply with all applicable sections of these ordinances.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CLEARING

The surface of the ground, for the area to be cleared and grubbed shall be completely cleared of all timber, brush, stumps, roots, grass, weeds, rubbish and all other objectionable obstructions resting on or protruding through the surface of the ground. However, trees shall be preserved as hereinafter specified unless otherwise designated by the County. Clearing operations shall be conducted so as to prevent damage to existing structures and installations and to those under construction, so as to provide for the safety of employees and others. Soil erosion control devices such as hay bales and silt fences shall be installed to satisfy all Federal, State and County requirements.

3.02 GRUBBING

Grubbing shall consist of the complete removal of all stumps, roots larger than 1-1/2 inches in diameter, matted roots, brush, timber, logs and any other organic or metallic debris not suitable for foundation purposes, resting on, under or protruding through the surface of the ground to a depth of 18 inches below the subgrade. All depressions excavated below the original ground surface for or by the removal of such objects, shall be refilled with suitable materials and compacted to a density conforming to the surrounding ground surface.

3.03 STRIPPING

In areas so designated, topsoil shall be stockpiled. Topsoil so stockpiled shall be protected until it is placed as specified. The County shall have the option to receive all excess topsoil materials. The Contractor shall pay all equipment and labor cost to

deliver excess top soil material to a remote site chosen by the County within a five-mile radius of the construction site. Should County not choose to receive any or all excess topsoil materials, the Contractor shall dispose of said material at no additional cost to County.

3.04 DISPOSAL OF CLEARED AND GRUBBED MATERIAL

The Contractor shall dispose of all material and debris from the clearing and grubbing operation by hauling such material and debris off site. The cost of disposal (including hauling) of cleared and grubbed material and debris shall be considered a subsidiary obligation of the Contractor; the cost of which shall be included in the prices bid for the various classes of work.

3.05 PRESERVATION OF TREES

Those trees which are not designated for removal by the County shall be carefully protected from damage. The Contractor shall erect such barricades, guards and enclosures as may be considered necessary by him for the protection of the trees during all construction operation.

3.06 PRESERVATION OF DEVELOPED PRIVATE PROPERTY

A. The Contractor shall exercise extreme care to avoid unnecessary disturbance of developed private property adjacent to proposed project site. Trees, shrubbery, gardens, lawns and other landscaping, which are not designated by the County to be removed, shall be replaced and replanted to restore the construction easement to the condition existing prior to construction.

B. All soil preservation procedures and replanting operations shall be under the supervision of a nursery representative experienced in such operations.

C. Improvements to the land such as fences, walls, outbuildings and other structures which of necessity must be removed, shall be replaced with equal quality materials and workmanship.

D. The Contractor shall clean up the construction site across developed private property directly after construction is completed upon approval of the County.

3.07 PRESERVATION OF PUBLIC PROPERTY

The appropriate paragraphs of these Specifications shall apply to the preservation and restoration of public lands, parks, rights-of-way, easements and all other damaged areas. This includes, but is not limited to the trimming of trees damaged by contractor's equipment.

END OF SECTION

SECTION 02221

TRENCHING, BEDDING AND BACKFILL FOR PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment and incidentals necessary to perform all excavation, backfill, fill, grading, trench protection or other related work required to complete the piping work shown on the Drawings and specified herein. The work shall include, but not be limited to: vaults; duct conduit; pipe; roadways and paving; backfilling; required fill or borrow operations; grading; disposal of surplus and unsuitable materials; and all related work such as sheeting, bracing and dewatering.

B. Prior to commencing work, the Contractor shall examine the site and review test borings if available, or undertake his own subsurface investigations and take into consideration all conditions that may affect his work.

C. The Contractor is responsible for the protection of every tree which is scheduled to remain in the project area. This includes trees which may or may not be shown on the plans. Every tree shall be adequately protected in place at no additional cost to the County. This includes, but is not limited to protecting the root systems and adjusting grades as necessary for tree/root protection.

1.02 PROTECTION

A. Sheeting and Bracing in Excavations:

1. In connection with construction of underground structures, the Contractor shall properly construct and maintain cofferdams. These shall consist of: sheeting and bracing as required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction and to protect adjacent structures, existing yard pipe and/or foundation material from disturbance, undermining, or other damage. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.
2. Trench sheeting for pipes: no sheeting is to be withdrawn if driven below, mid-diameter of any pipe and no wood sheeting shall be cut off at a level lower than one foot above the top of any pipe unless otherwise directed by the County. During the progress of the work, the County may direct the Contractor in writing to leave additional wood sheeting in place. If steel sheeting is used for trench sheeting, removal shall be as specified above, unless written approval is given for an alternate method of removal.

3. All sheeting and bracing not left in place shall be carefully removed in such a manner as not to endanger the construction or other structures, utilities, existing piping, or property. Unless otherwise approved or indicated on the Drawings or in the Specification, all sheeting and bracing shall be removed after completion of the piping or structure, care being taken not to disturb or otherwise injure the pipeline or finished masonry. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools specifically made for that purpose, by watering, or as may otherwise be directed.
4. The Contractor shall construct, to the extent he deems it desirable for his method of operation, the cofferdams and sheeting outside the neat lines of the pipeline trench or foundation unless otherwise indicated on the Drawings or directed by the County. Sheeting shall be plumb and securely braced and tied in position. Sheeting, bracing and cofferdams shall be adequate to withstand all pressures to which the pipeline or structure will be subjected. Pumping, bracing and other work within the cofferdam shall be done in a manner to avoid disturbing any construction of the pipeline or the enclosed masonry. Any movement or bulging which may occur shall be corrected by the Contractor at his own expense so as to provide the necessary clearances and dimensions.
5. Drawings of the cofferdams and design computations shall be submitted to the County and approved prior to any construction. However, approval of these drawings shall not relieve the Contractor of the responsibility for the cofferdams. The drawings and computations shall be prepared and stamped by a Registered Professional Engineer in the State of Florida and shall be in sufficient detail to disclose the method of operation for each of the various stages of construction, if required, for the completion of the pipeline and substructures.

B. Dewatering, Drainage and Flotation

1. The Contractor shall construct and place all pipelines, concrete work, structural fill, bedding rock and limerock base course, in-the-dry. In addition, the Contractor shall make the final 24" of excavation for this work in-the-dry and not until the water level is a minimum of 6" below proposed bottom of excavation.
2. The Contractor shall, at all times during construction, provide and maintain proper equipment and facilities to remove promptly and dispose of properly all water entering excavation and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fill, structure, or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural elevations.
3. Dewatering shall at all times be conducted in such a manner as to preserve the natural undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.
4. Wellpoints may be required for dewatering the soil prior to final excavation for deeper in-ground structures or piping and for maintaining the lowered groundwater level until construction has been completed to avoid the structure, pipeline, or fill from becoming floated or otherwise damaged. Wellpoints shall be surrounded by suitable filter sand and no fines shall be removed by pumping. Pumping from wellpoints shall be continuous and standby pumps shall be provided.

5. The Contractor shall furnish all materials and equipment to perform all work required to install and maintain the proposed drainage systems for handling groundwater and surface water encountered during construction of structures, pipelines and compacted fills.
6. Where required, the Contractor shall provide a minimum of two operating groundwater observation wells at each structure to determine the water level during construction of the pipeline or structure. Locations of the observation wells shall be at structures and along pipelines as approved by the County prior to their installation. The observation wells shall be extended to 6 inches above finished grade, capped with screw-on caps protected by 24" x 24" wide concrete base and left in place at the completion of this Project.
7. Prior to excavation, the Contractor shall submit his proposed method of dewatering and maintaining dry conditions to the County for approval. Such approval shall not relieve the Contractor of the responsibility for the satisfactory performance of the system. The Contractor shall be responsible for correcting any disturbance of natural bearing soils for damage to pipeline or structures caused by an inadequate dewatering system or by interruption of the continuous operation of the system as specified.
8. As part of his request for approval of a dewatering system, the Contractor shall demonstrate the adequacy of the proposed system and wellpoint filter sand by means of a test installation. Discharge water shall be clear, with no visible soil particles in a one quart sample. Discharge water shall not flow directly into wetlands or Waters of the State as defined by FDEP and SWFWMD.
9. During backfilling and construction, water levels shall be measured in observation wells located as directed by the County.
10. Continuous pumping will be required as long as water levels are required to be below natural levels.

PART 2 PRODUCTS

2.01 MATERIALS

A. General

1. Materials for use as fill and backfill shall be described below. For each material, the Contractor shall notify the County of the source of the material and shall furnish the County, for approval, a representative sample weighing approximately 50 pounds, at least ten calendar days prior to the date of anticipated use of such material.
2. Additional materials shall be furnished as required from off-site sources and hauled to the site.

B. Structural Fill

1. Structural fill in trenches shall be used below spread footing foundations, slab-on-grade floors and other structures as backfill within three feet of the below grade portions of structures.
2. Structural fill material shall be a minimum of 60 percent clean sand, free of organic, deleterious and/or compressible material. Minimum acceptable density shall be 98 percent of the maximum density as determined by AASHTO T-180. Rock in excess of 2-1/2" in diameter shall not be used in the fill material. If the moisture content is

improper for attaining the specified density, either water shall be added or material shall be permitted to dry until the proper moisture content for compaction is reached.

C. Common Fill

1. Common fill material shall be free from organic matter, muck or marl and rock exceeding 2-1/2" in diameter. Common fill shall not contain broken concrete, masonry, rubble or other similar materials. Existing soil may be used to adjust grades over the site with the exception of the construction area.
2. Material falling within the above specification, encountered during the excavation, may be stored in segregated stockpiles for reuse. All material which, in the opinion of the County, is not suitable for reuse shall be spoiled as specified herein for disposal of unsuitable materials by the Contractor.

D. Crushed Stone

1. Crushed stone may be used for pipe bedding, manhole bases, as a drainage layer below structures with underdrains and at other locations indicated on the Drawings.
2. Crushed stone shall be size No. 57 with gradation as noted in Table 1 of Section 901 of Florida Department of Transportation, Construction of Roads and Bridges.

PART 3 EXECUTION

3.01 TRENCH EXCAVATION AND BACKFILLING

A. Excavation for all trenches required for the installation of pipes and electrical ducts shall be made to the depths indicated on the Drawings and in such manner and to such widths as will give suitable room for laying the pipe or installing the ducts within the trenches.

B. Rock shall be removed to a minimum 6" clearance around the bottom and sides of all the pipe or ducts being laid.

C. Where pipes or ducts are to be laid in limerock bedding or encased in concrete, the trench may be excavated by machinery to or just below the designated subgrade provided that the material remaining in the bottom of the trench is no more than slightly disturbed.

D. Where the pipes or ducts are to be laid directly on the trench bottom, the lower part of the trenches shall not be excavated to grade by machinery. The last of the material being excavated manually, shall be done in such a manner that will give a flat bottom true to grade so that pipe or duct can be evenly supported on undisturbed material. Bell holes shall be made as required.

E. Backfilling over pipes shall begin as soon as practicable after the pipe has been laid, jointed and inspected and the trench filled with suitable compacted material to the mid-diameter of the pipe.

F. Backfilling over ducts shall begin not less than three days after placing concrete encasement.

G. All backfilling shall be prosecuted expeditiously and as detailed on the Drawings.

H. Any space remaining between the pipe and sides of the trench shall be packed full by hand shovel with selected earth, free from stones having a diameter greater than 2" and thoroughly compacted with a tamper as fast as placed, up to a level of one foot above the top of the pipe.

I. The filling shall be carried up evenly on both sides with at least one man tamping for each man shoveling material into the trench.

J. The remainder of the trench above the compacted backfill, as just described above, shall be filled and thoroughly compacted by rolling, ramming, or puddling, as the County may direct, sufficiently to prevent subsequent settling.

END OF SECTION

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SECTION 02223

EXCAVATION BELOW GRADE AND CRUSHED STONE OR SHELL REFILL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. If in the opinion of the County, the material at or below the normal grade of the bottom of the trench is unsuitable for pipe or structure foundation, it shall be removed to the depth directed by the County and replaced by crushed stone or washed shell.

PART 2 PRODUCTS (NOT USED)

PART 3 MATERIALS

3.01 EXCAVATION AND DRAINAGE

A. Whatever the nature of unstable material encountered or the groundwater conditions, trench stabilization shall be complete and effective.

B. Should the Contractor excavate below the grade shown on the Contract drawings because of negligence or for his own convenience; due to failure in properly dewatering the trench; disturbs the subgrade before dewatering is sufficiently complete; he shall be directed by the County to excavate below grade. The work of excavating below grade and furnishing and placing the approved refill material shall be performed at the Contractor's expense.

3.02 REFILL

A. Should the material at the level of trench bottom consist of fine sand, sand and silt or soft earth, the subgrade material shall be removed as directed by the County and the excavation shall be refilled with crushed stone or washed shell.

END OF SECTION

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SECTION 02260

FINISH GRADING

PART 1 GENERAL

1.01 WORK INCLUDED

A. The Contractor shall finish grade sub-soil.

B. The Contractor shall cut out areas to receive stabilizing base course materials for paving and sidewalks.

C. The Contractor shall place, finish grade and compact top soil.

1.02 PROTECTION

The Contractor shall prevent damage to existing fencing, trees, landscaping, natural features, bench marks, pavement and utility lines. Damage shall be corrected at no cost to the County.

PART 2 PRODUCTS

A. Topsoil: Shall be friable loam free from subsoil, roots, grass, excessive amount of weeds or other organics, stones, and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 4 percent and a maximum of 25 percent organic matter. The Contractor may use topsoil stockpiles on site if they conform to these requirements.

PART 3 EXECUTION

3.01 SUB-SOIL PREPARATION

A. The Contractor shall rough grade sub-soil systematically to allow for a maximum amount of natural settlement and compaction. Uneven areas and low spots shall be eliminated. Debris, roots, branches or other organics, stones, and sub-soil shall be removed by the Contractor and disposed of in a manner consistent with the latest Manatee County Standards as well as any affected regulatory agency. Should contaminated soil be found, the Contractor shall notify the County.

B. The Contractor shall cut out areas to sub-grade elevation to stabilize base material for paving and sidewalks.

C. The Contractor shall bring sub-soil to required profiles and contour graces gradually; and blend slopes into level areas.

D. The Contractor shall slope the structure grade a minimum of two (2) inches in ten (10) feet unless indicated otherwise on the Drawings.

E. The Contractor shall cultivate sub-grade to a depth of 3 inches where the topsoil is to be placed. He shall repeat cultivation in areas where equipment use has compacted sub-soil.

F. The Contractor shall not make grade changes which causes water to flow onto adjacent lands.

3.02 PLACING TOPSOIL

A. The Contractor shall place topsoil in areas where seeding, sodding and planting is to be performed. He shall place from the following minimum depths, up to finished grade elevations:

1. 6 inches for seeded areas
2. 4-1/2 inches for sodded areas
3. 24 inches for shrub beds
4. 18 inches for flower beds

B. The Contractor shall use topsoil in a dry state as determined by the County. He shall place the material during dry weather.

C. The Contractor shall use fine grade topsoil eliminating rough and low areas to ensure positive drainage. He shall maintain levels, profiles and contours of the sub-grades.

D. The Contractor shall remove stone, roots, grass, weeds, debris, and other organics or foreign material while spreading the material.

E. The Contractor shall manually spread topsoil around trees, plants and structures to prevent damage which may be caused by grading equipment.

F. The Contractor shall lightly compact and place the topsoil.

3.03 SURPLUS MATERIAL

A. The Contractor shall remove surplus sub-soil and topsoil from site at his expense.

B. The Contractor shall leave stockpile areas and entire job site clean and raked, ready for landscaping operations.

END OF SECTION

SECTION 02276

TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

A. The work specified in this Section consists of the design, provision, maintenance and removal of temporary erosion and sedimentation controls as necessary.

B. Temporary erosion controls include, but are not limited to: grassing, mulching, netting, watering, and the reseeding of on-site surfaces and spoil and borrow area surfaces, interceptor ditches at ends of berms and other such work at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the County.

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

D. The 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. Florida Building Code.

B. FDEP/COE Dredge and Fill Regulations and/or Permit as applicable.

C. SWFWMD Permit Regulations and/or Permit as applicable.

D. Florida Stormwater, Erosion and Sedimentation Control Inspector’s Manual.

PART 2 PRODUCTS

2.01 EROSION CONTROL

A. Netting - fabricated of material acceptable to the County.

B. Seed and sod.

2.02 SEDIMENTATION CONTROL

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

B. Netting - fabricated of material acceptable to the County.

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 shall be:

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. The Contractor shall install and maintain silt dams, traps, barriers, and appurtenances as shown on the approved descriptions and working drawings. Deteriorated hay bales and dislodged filter stone shall be replaced by the Contractor at his expense.

3.03 PERFORMANCE

A. The Contractor, at his own expense, shall immediately take whatever steps are necessary to correct any deficiencies of the temporary erosion and sediment control measures employed if they fail to produce results or do not comply with the requirements of the State of Florida or any other federal, governmental or regulatory agency.

END OF SECTION

SECTION 02325

ROAD AND RAILROAD CROSSINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, equipment, materials and incidentals required to install road or railroad crossings as shown on the Drawings and as specified herein.

1.02 OPERATIONS ON MANATEE COUNTY OR STATE OF FLORIDA PROPERTY

A. All work affecting Manatee County, Florida Department of Transportation, any other governmental agency's right-of-way or facilities, or railroad right-of-way shall be carried out to the full satisfaction of the applicable Department's authorized representative. The Contractor shall be responsible to meet any and all requirements of the Department of Transportation, railroad, or other agency pertaining to the specific project and shall conduct all his work accordingly.

B. Prior to the start of the jacking operation, a detailed jacking plan shall be submitted to the County for review and approval. No work shall be permitted until the submittals are accepted. A Bore Path Report shall be submitted within three (3) days of completion of the bore.

C. Prior to construction, a minimum of three working days written notice prior to start of the actual work shall be given to the County and to the Florida Department of Transportation or other applicable agency.

D. The Contractor shall install, maintain and leave in place any sheeting, underpinning, cribbing and other related items (other than that required for the jacking pits) to support any structures or facility on the right-of-way owned by either Manatee County, Florida Dept. of Transportation or other governmental agency or railroad entity. The Contractor, at his expense, may be directed by the Department of Transportation, other applicable agency, or the County, to leave sheeting in place.

E. The Contractor shall perform all necessary soil test borings to determine actual soil conditions and shall utilize the results of said borings to determine the procedures required for each jack and bore operation, including, but not limited to, the presence of rock and necessary dewatering requirements.

F. No wires, equipment, or other appurtenances shall be permitted to be placed across or pass across State property without the express written permission of the Department of Transportation’s authorized representative.

G. All equipment used by the Contractor on State property may be inspected by the State and shall not be used if it is deemed unsatisfactory by an authorized State representative. State highways shall be kept free of obstructions at all times.

H. No blasting shall be permitted under or adjacent to any State highways.

I. The Contractor shall be responsible for all damages arising from his negligence or failure to comply with any State or Manatee County regulations or requirements or deviations from the Contract Documents.

J. All State highway crossings shall be performed and completed in a manner fully satisfactory to the Department of Transportation and Manatee County.

K. Traffic control requirements and procedures are detailed in Section 01570 of this specification.

1.03 SHOP DRAWINGS

The Contractor shall furnish working drawings showing all fabrication and construction details for the jacked crossings.

1.04 SUBMITTALS

A. Contractor shall submit a Jacking Plan that includes the following:

1. Site layout plan for entry and exit pit locations, drawn to scale, depicting the position of all required equipment, access points, existing facilities to remain in place, existing traffic lanes to be maintained in operation, office trailers and storage sites.
2. Qualification information on jack/bore contractor.
3. Manufacturer's information on equipment to be used.
4. Methods and materials for retaining walls for jacking and receiving pits.

B. Bore Report that details final alignment, dimensions, and record documentation.

PART 2 PRODUCTS

2.01 MATERIALS

Sleeve, carrier pipe, skids, insulation, bulkheads, etc. shall be per contract plans.

PART 3 EXECUTION

3.01 JACKING SLEEVE

A. The Contractor shall provide all labor, material, equipment and appurtenances required for jacking the sleeves beneath the roadway or railroad tracks. The steel sleeve shall be welded steel pipe and jacked in one continuous operation at the locations shown on the drawings. Once the operation starts, jacking shall not be discontinued. Proper alignment and elevation of the sleeves shall be consistently maintained throughout the jacking operation.

B. The Contractor shall shore the jacking pits with sheeting or such other materials as required. Sheeting shall be driven to a sufficient depth below the invert of the steel sleeve to resist any pressure developed by the soil outside the jacking pit. Sheeting shall terminate not less than 3-feet, 6-inches above existing grade.

C. The sections of steel sleeve shall be field welded in accordance with the applicable portions of AWWA C-206 for field welded water pipe joints. Steel sleeve shall receive one coat of Tnemec 46H-413 Hi-Build Tnemec-tar applied in accordance with manufacturer's recommendation.

D. At the completion of the jacking operations, the Contractor shall be required to leave all sheeting in place. The top of the sheeting shall be cut off 36-inches below finished grade.

E. The Contractor shall be responsible for preventing voids outside the steel sleeves. Should they occur, the Contractor may be directed to fill them with grout in a method approved by the County. The Contractor shall exercise care in the sleeve removal to prevent voids.

F. The Contractor shall be responsible for furnishing, installing and removing the thrust block or restraint which was employed in driving the sleeve forward. No additional payment for the jacking restraint shall be made other than the unit price for this item. The entire jacking operation shall be discussed and accepted by the County prior to commencing jack and bore operation. After completion, the backup structures shall be removed in part or whole to permit construction of the pipeline in the sleeve.

3.02 INSTALLING PIPE IN SLEEVE

A. The Contractor shall install the pipe in full conformity with the Contract Documents. The pipe shall be installed to the lines and grades required within the sleeve and placed to the approval of the County. The pipe shall be braced to the side and the top of the sleeve to prevent flotation or motion.

B. A bulkhead shall be placed at the ends of the sleeve to keep the surrounding soil and material from migrating into the voids in the sleeve.

3.03 TESTING

The pipe shall be tested as provided in the Contract Document.

END OF SECTION

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SECTION 02444

FENCING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, material, equipment and incidentals necessary for complete installation of chain link fence systems. The fencing shall be installed according to manufacturer's specifications unless otherwise directed or authorized by the County.

B. The Contractor's security fencing is at his expense and option and is not covered in this Section.

1.02 QUALITY ASSURANCE

A. Standards of Manufacture shall comply with the standards of the Chain Link Fence Manufacturer's Institute for "Galvanized Steel Chain Link Fence Fabric" and as herein specified.

B. Provide each type of steel fence and gates as a complete unit produced by a single manufacturer, including, but not limited to accessories, fittings, fasteners and appurtenances complete and ready for use.

C. Acceptable Manufacturers: Anchor, Cyclone, or approved equal

D. Erector Qualifications: The Contractor or approved subcontractor, must have a minimum of two years experience in similar fence installation.

1.03 SUBMITTALS

A. Product Data:

For Steel Fences and Gates, the Contractor shall submit for review and approval to the County, five (5) copies of the manufacturer's technical data, details of fabrication, installation instructions and procedures for steel fences and gates. The Contractor shall be responsible for a copy of each instruction to be given to the Installer.

B. Samples:

The Contractor shall submit two samples approximate size 6-inches long, or 6-inches square of fabric material, framework members and typical accessories to the County for review and approval.

C. Certificates:

The Contractor shall provide manufacturer's certification that materials meet or exceed the Contract Document requirements.

PART 2 PRODUCTS

2.01 GENERAL

A. The pipe sizes indicated are commercial pipe sizes.

B. The tube sizes indicated are nominal outside dimension.

C. Framework and appurtenances shall be finished with not less than minimum weight of zinc per sq. ft. and shall comply with the following:

1. Pipe: ASTM A53 (1.8 oz. zinc psf)
2. Square tubing: ASTM A 123 (2.0 oz. zinc psf)
3. Hardware and Accessories: ASTM A 153 (zinc weight per Table I).

D. All fence components shall be galvanically compatible.

E. Vinyl coatings for fabric, posts, rails, gates, and all other fittings and components shall be thermally fused polyvinyl chloride; heavy mil coating per ASTM F 668. Coating shall be 6-gauge black vinyl finish.

2.02 FABRIC

Fabric shall be 0.148 inch (9 gage) steel wire, 2-inch diamond mesh and both top and bottom salvages shall be twisted and barbed for fabric over 60-inches high. Finish shall be hot dipped galvanized, ASTM A 392, Class II.

2.03 POSTS, RAILS AND BRACES

A. End, Corner and Pull Posts:

1. The Contractor shall furnish end, corner and pull posts of the minimum size and weight as follows:
   a. Up to 5-foot fabric height
      (1) 2.375-inch OD pipe weighing 3.65 pounds per linear ft.
      (2) 2.50-inch square tubing weighing 5.59 pounds per linear foot.
   b. Over 5-foot fabric height
      (1) 2.875-inch OD pipe weighing 5.79 pounds per linear foot.
      (2) 2.50-inch square tubing weighing 5.59 lbs. per linear foot.

B. Line Post:

1. The Contractor shall furnish line posts of the minimum sizes and weight as follows. Post shall be spaced 10 foot o.c. maximum, unless otherwise indicated:
   a. Up to 5-foot fabric height.
      (1) 1.90-inch OD pipe weighing 2.72 pounds per linear foot.
   b. Over 5-foot fabric height.
      (1) 2.375-inch OD pipe weighing 3.65 pounds per linear foot.

C. Gate Posts:

1. The Contractor shall furnish gate posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:
   a. Up to 6 feet wide.
      (1) 2.875-inch OD pipe weighing 5.79 pounds per linear foot.
      (2) 2-1/2 inch square tubing weighing 5.59 pounds per linear foot.
   b. Over 6 feet and up to 13 feet wide.
      (1) 4-inch OD pipe weighing 9.11 pounds per linear foot.
   c. Over 13 feet and up to 18 feet wide.
      (1) 6.625 inches OD weighing 18.97 pounds per linear foot.
   d. Over 18 feet.
      (1) 8.625 inches OD weighing 28.55 pounds per linear foot.

D. Top Rails:

1. The Contractor shall furnish the following top rails unless otherwise indicated:
   a. 1.660-inch OD pipe weighing 2.27 pounds per linear foot.

E. Post Brace Assembly:

1. The Contractor shall furnish bracing assemblies at the end, gate, at both sides of corner and pull posts, with the horizontal brace located at mid-height of the fabric.
2. Use 1.660-inch OD pipe weighing 2.27 pounds per linear foot for horizontal brace and 3/8-inch diameter rod with turnbuckles for diagonal truss.

F. Tension Wire:

1. The Contractor shall furnish tension wire consisting of galvanized 0.177 inch (7 gage) coiled spring wire as per ASTM A824 at the bottom of the fabric only.

G. Barbed Wire Supporting Arms:

1. The Contractor shall furnish pressed steel, wrought iron, or malleable iron barbed wire supporting arms, complete with provisions for anchorage to posts and attaching three rows of barbed wire to each arm. Supporting arms may be attached either to posts or integral with post top weather cap. The Contractor shall provide a single 45 degree arm for each post where indicated.

H. Barbed Wire:

1. The Contractor shall furnish barbed wire. It shall be 2 strand, 12-1/2 gauge wire with 14 gauge, 4-point barbs spaced 5-inch o.c., galvanized, complying with ASTM A121, Class 3.

I. Post Tops:

1. The Contractor shall furnish post tops. Tops shall be pressed steel, wrought iron, or malleable iron of ASTM F626 designed as a weathertight closure cap (for tubular posts). The Contractor shall furnish one cap for each post unless equal protection is afforded by a combination of post top cap and barbed wire supporting arm. The Contractor shall furnish caps with openings to permit through passage of the top rail.

J. Stretcher Bars:

1. The Contractor shall furnish stretcher bars. Bars shall be one piece lengths equal to the full height of the fabric, with a minimum cross-section of 3/16-inch x 3/4-inch. The Contractor shall provide one stretcher bar for each gate and end post and two bars for each corner and pull post, except where fabric is integrally woven into the post.

K. Stretcher Bar Bands:

1. The Contractor shall furnish stretcher bar bands. Bands shall be steel, wrought iron, or malleable iron, a maximum space of 15-inch o.c. to secure stretcher bars to end, corner, pull and gate posts.

2.04 GATES

A. The Contractor shall provide fabricated gate perimeter frames of tubular members. Additional horizontal and vertical members shall ensure proper gate operation and attachment of fabric, hardware and accessories. The maximum space of the frame members shall not be more than 8-inches apart. Fabrication is as follows:

1. Up to 5 feet high, or leaf width 8 feet or less.
   a. 1.660-inch OD pipe weighing 2.27 pounds per linear foot.
   b. 1.5-inch sq. tubing weighing 2.27 pounds per linear foot.
2. Over 5 feet high, or leaf width exceeding 8 feet.
   a. 1.90 inch OD pipe weighing 2.72 pounds per linear foot.
   b. 2-inch square tubing weighing 2.60 pounds per linear foot.

B. The Contractor shall assemble gate frames by welding or with special malleable or pressed steel fittings and rivets for rigid connections. He shall use the same fabric width as for the fence, unless otherwise indicated in the Contract Documents or authorized by the County. He shall install the fabric with stretcher bars at vertical edges. The bars may also be used at the top and bottom edges. The contractor shall attach stretchers to the gate frame at a maximum spacing of 15-inch o.c. He shall attach the hardware with rivets or by other means which will prevent removal or breakage.

C. The Contractor shall install diagonal cross-bracing consisting of 3/8-inch diameter adjustable length truss rods on gates as necessary to ensure frame rigidity without sag or twist.

D. The Contractor shall install barbed wire above the gates. He shall extend the end members of gate frames 12-inches above the top member which will be prepared for three strands of wire. The Contractor shall provide necessary clips for securing wire to extensions.

E. Gate Hardware:

1. The Contractor shall furnish the following hardware and accessories for each gate.
   a. Hinges: Pressed or forged steel or malleable iron to suit gate size, non-lift-off type, offset to permit 180 degrees gate opening. Provide 1-1/2 pair of hinges for each leaf over six feet nominal height.
   b. Latch: Forked type of plunger-bar type to permit operation from either side of gate with padlock eye as integral part of latch.
   c. Keeper: Provide keeper for all vehicle gates, which automatically engages the gate leaf and holds it in the open position until manually released.
   d. Double Gates: Provide gate stops for double gates, consisting of mushroom type of flush plate with anchors. Set in concrete to engage the center drip drop rod or plunger bar. Include locking device and padlock eyes as an integral part of the latch, using one padlock for locking both gate leaves.
   e. Where gates are between masonry piers, provide "J" with 4-inch square anchor plate to masonry contractor for building in.

2.05 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Wire Ties: The Contractor shall tie fabric to line posts. He shall use 9 gauge wire ties spaced 12-inches o.c. For tying fabric to rails and braces, he shall use 9 gauge wire ties spaced 24-inches o.c. For tying fabric to tension wire, he shall use 11 gauge hog rings spaced 24-inches o.c. The finish of ties shall match the fabric finish.

B. Concrete: The Contractor shall provide portland cement concrete in compliance with ASTM C-150 and the Contract Documents. Aggregates shall comply with ASTM C-33. The Contractor shall mix the materials to obtain a minimum 28-day compressive strength of 2500 psi, using a minimum of 4 sacks of cement per cubic yard, a maximum size aggregate of 1-inch, a maximum 3-inch slump and air entrainment of 2 percent to 4 percent.

C. Privacy Decorative Slatting (PDS) shall be PVC, bottom locking, non-fin type, sized to match the fabric height and color in both the fence and gates.

PART 3 EXECUTION

3.01 INSTALLATION

A. The Contractor shall not start the fence installation prior to the final grade completion, and the finish elevations established, unless otherwise authorized by the County.

B. The Contractor shall repair damaged coatings in the shop or in the field by recoating utilizing manufacturers recommended repair compounds and as applied per manufacturer's recommendations.

C. Excavation:

1. For post footings, the Contractor shall drill holes in firm, undisturbed or compacted soil of the diameters and spacings shown or called out in the Contract Documents.
   a. For holes not shown or called out on the Contract Documents, the Contractor shall excavate minimum diameters recommended by the fence manufacturer.
   b. Post holes shall be in true alignment and of sufficient size to provide a permanent concrete foundation. Concrete shall be poured against undisturbed earth sides and bottom. All holes shall be 48-inches deep with posts and corner posts placed in the concrete to a depth of 36-inches. The gate posts shall be set in the concrete to a depth of 42-inches below the surface in firm, undisturbed soil. Holes shall be well centered on the posts. A minimum diameter of 12-inches shall be required for all post holes.
   c. Excavated soil shall be removed from the County's property.
   d. If solid rock is encountered near the surface, the Contractor shall drill into rock at least 12-inches for line posts and at least 18-inches for end, pull, corner or gate posts. Hole shall be drilled to at least 1-inch greater diameter than the largest dimension of the post to be place.
   e. If the Contractor encounters solid rock below solid overburden, he shall drill to the full depth required; however, rock penetration need not exceed the minimum depths specified.

D. Setting Posts:

1. The Contractor shall remove loose and foreign materials from the sides and bottoms of holes, and moisten soil prior to placing concrete.
   a. Center and align posts in holes above bottom of excavation.
   b. Place concrete around posts in a continuous pour and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations. The top of concrete shall extend 2-inches above finish grade.
   c. Trowel finish tops of footings and slope or dome to direct water away from posts. Extend footings for gate posts to the underside of bottom hinge. Set keeps, stops, sleeves and other accessories into concrete as required.
   d. Keep exposed concrete surfaces moist for at least 7 days after placement, or cure with membrane curing materials, or other acceptable curing method.
   e. Grout-in posts set into sleeved holes, concrete constructions, or rock excavations with non-shrink portland cement grout, or other acceptable grouting material.

E. Concrete Strength:

The Contractor shall allow the concrete to attain at least 75% of its minimum 28-day compressive strength no sooner than 7 days after placement, before rails, tension wires, barbed wire, or fabric is installed. The Contractor shall not stretch and tension fabric or wires and shall not hang gates until the concrete has attained its full design strength.

F. Top Rails:

The Contractor shall run the rail continuously through post caps or extension arms and bend to radius for curved runs. He shall provide expansion coupling as recommended by fencing manufacturer.

G. Brace Assemblies:

The Contractor shall install braces so that posts are plumb when diagonal rod is under proper tension.

H. Tension Wire:

The Contractor shall install tension wires by weaving through the fabric and tying to each post with not less than 0.170 inch galvanized wire, or by securing the wire to the fabric.

I. Fabric:

The Contractor shall leave approximately 3-inches between finish grade and bottom salvage, except where the bottom of the fabric extends into the concrete. He shall pull the fabric taut and tie it to posts, rails and tension wires. He shall install fabric on the security side of the fence and anchor it to the framework so that the fabric remains in tension after the pulling force is released.

J. Stretcher Bars:

The Contractor shall thread through or clamp the bars to the fabric 4-inches o.c. and secure them to posts with metal bands spaced 15-inches o.c.

K. Barbed Wire:

The Contractor shall install 3 parallel wires on each extension arm on the security side of fence, unless otherwise indicated. He shall pull the wire taut and fasten securely to each extension arm.

L. Gate:

The Contractor shall install gates plumb, level and secure for full opening without interference. He shall install ground-set items in concrete for anchorage, as recommended by the fence manufacturer. He shall adjust hardware for smooth operation and lubricate where necessary.

M. Tie Wires:

The Contractor shall use U-shaped wire, conforming to the diameter of the attached pipe, and shall clasp the pipe and fabric firmly with twisted ends of at least 2 full turns. He shall bend the end of the wire to minimize hazard to persons or clothing.

N. Fasteners:

The Contractor shall install nuts for tension band and hardware bolts on the side of fence opposite the fabric side. Pen ends of bolts or score threads to prevent removal of nuts.

3.02 INSTALLATION

Fence shall be constructed such that each run of fence between corner posts or gate posts has equal spacing between the line posts. Spacing shall not exceed 10 feet, and shall not exceed 8 feet for fabric with privacy decorative slatting.

END OF SECTION

SECTION 02480

LANDSCAPING

PART 1 GENERAL

1.10 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to install trees, ground cover, and shrubs, to place accessory planting materials, to maintain and guarantee all planted areas. All work shall be in strict accordance with sound nursery practice and shall include maintenance and watering of all of the work of this Contract until final completion and acceptance by the County.

B. The landscaping shall be performed by a contractor or subcontractor who specializes in landscaping and who is fully familiar and experienced in projects of this type and scope. The landscaping contractor or subcontractor shall be subject to the approval of the County.

C. The Contractor shall provide all landscaping complete and ready for use as specified in the Contract Documents and as shown on the Drawings.

1.02 SUBMITTALS

A. The Contractor shall submit to the County for review and approval, shop drawings and complete written maintenance instructions for each type of plant furnished under this Contract.

B. The Contractor shall submit representative samples of any or all of required accessory planting materials as requested by the County.

1.03 OBSTRUCTIONS BELOW GROUND

A. The County may change the location of plant material if underground construction, utilities or obstructions are encountered in excavation of planting areas or pits.

B. The Contractor shall make such changes without additional compensation from the County.

PART 2 PRODUCTS

2.01 MATERIALS

A. Plant species and size shall conform to those indicated in the Plant List and in plan locations shown on the Drawings. Nomenclature shall conform to the Florida Department of Agriculture: "Grades and Standards for Nursery Plants". The designated authority for identification of plants shall be in conformance with FDOT Standard Specification Section 580-2.1.1 Plants.

B. Plants shall be sound, healthy, vigorous, free from plant diseases, insects, pests, or their eggs and shall have healthy normal root systems. Plants shall be nursery grown stock, freshly dug. No heeled in, cold storage, or collected stock shall be accepted.

C. Shape and Form

1. Plant material shall be symmetrical, typical for the variety and species, and shall conform to the measurements specified in the Plant List.
2. Plants used where symmetry is required shall be matched as nearly as possible.
3. Plants shall not be pruned prior to delivery except as authorized by the County.
4. All plants shall have been transplanted or root pruned at least once in the past three years.
5. Unless otherwise noted, street trees shall be free of branches up to six feet, with the single leader well branched, and with straight trunks.
6. Shrubs shall have been transplanted twice, have fully developed root systems, be heavily canned with foliage to base, fulfill dimensions required, and be typical of species.
7. Ground covers shall have sturdy fibrous root systems and shall be heavily leafed.

D. Measurement: The height and/or width of trees shall be measured from the ground or across the normal spread of branches with the plants in their normal position. This measurement shall not include the immediate terminal growth.

E. Substitutions in plant species or size shall be made only with the written approval of the County.

F Ground cover plants shall be planted in beds of four inches of approved topsoil. The beds shall be thoroughly disked into the soil. The compacted and settled finished surface shall be set to the required grade. Plants shall be spaced as described in the Contract Documents or shown on the Contract Drawings, or otherwise directed by the County in accordance with the best practices of the trade.

G. Planting Soil

1. Soil for backfilling around plants and planting beds shall be a good grade of garden loam as approved by the County. Soil shall be free of heavy clay, coarse sand, stones, lumps, sticks, or other foreign material. The soil shall not be delivered or used in a muddy condition.
2. The soil shall be taken from ground that has never been stripped. There shall be a slight acid reaction to the soil with no excess of calcium or carbonate. The soil shall be free from excess weeds or other objectionable material.
3. Soil for trees and shrubs shall be delivered in a loose, friable condition. All trees shall average approximately one cubic yard per tree, except Sabal Palmetto, which shall be planted with clean sand. There shall be a minimum of 4-inches of planting soil in ground cover areas and 1/8 cubic yard per shrub or vine.
4. No marl shall be allowed in ground cover planting beds.

H. Before plants are backfilled with planting soil, fertilizer tablets, Agriform 20-10-5 or equal, shall be placed in each pit. The Contractor shall provide three tablets for each tree and one for each shrub or vine.

I. Tree Staking: All tree staking and bracing shall be included herein in accordance with sound nursery practice and shall be in accordance with the Contract Documents. The Contractor shall furnish all materials required for staking and bracing as approved.

J. Landscaping stones shall be inert and nonleaching. The Contractor shall provide physical samples for approval prior to installation. Crushed limerock shall not be acceptable.

PART 3 EXECUTION

3.01 PLANTING PROCEDURES

A. Plant Locations: All plants shall be located as shown on the Drawings, to dimensions if shown, to scale if not dimensioned. Large areas or beds shall be scaled and the plants spaced evenly. Approval by the County is required before any plants may be installed.

B. Tree Pits: Pits for trees shall be at least two feet greater in diameter than the specified diameter of the ball. Pits shall be of sufficient depth to allow a 12-inch layer of planting soil under the ball when it is set to grade. Bottom of pit shall be loosened prior to backfilling.

C. Digging and Handling

1. Plants shall be handled at all times so that roots or balls are adequately protected from sun or drying winds. Tops or roots of plant allowed to dry out will be rejected.
2. Balled and burlapped plants shall be moved with firm, natural balls of soil, not less than one foot diameter of ball to every one inch caliper of trunk, and a depth of not less than 2/3 of ball diameter. No plant shall be accepted when the ball of earth surrounding its roots has been cracked or broken. All trees, except palms, shall be dug with ball and burlapped. Root pruning shall have been done at minimum of four weeks before planting at the job.
3. Bare root plants shall be dug with spread of root and of sufficient depth to insure full recovery of plant.

D. Cabbage Palms (Sable Palmetto):

1. Cabbage Palms shall be taken from moist black sand areas. Only a minimum of fronds shall be removed from the crown to facilitate moving and handling. Clear trunk or overall height shall be as specified after the minimum of fronds have been removed.
2. Cabbage Palms buds shall be tied to a suitable support with a burlap strip, to be left in place until the tree is well established in its new location.
3. Cabbage Palms shall be planted in sand, thoroughly washed in during planting operations, and with a dished or saucer depression left at the soil line for future waterings. Palms with marred or burned trunks will be accepted at the discretion of the County only.
4. Trees moved by winch or crane shall be thoroughly protected from chain marks, girdling or bark slippage by means of burlap, wood battens, or other approved method.

E. When balled or burlapped plants are set, planting soil shall be carefully tamped under and around the base of the balls to prevent voids. All burlap, rope, wires, etc., shall be removed from the sides and tops of balls, but no burlap shall be pulled from underneath. Roots of bare rooted plants shall be properly spread out and planting soil carefully worked in among them.

F. All plants shall be set straight or plumb, in locations shown on the Drawings. Except as otherwise specified, plants shall be planted in pits which shall be set at such level that, after settlement, they bear the same relation to the finished grade or the surrounding ground as they bore to the grade of the soil from which they are taken.

G. Pruning shall be carefully done by experienced plantsmen. Prune immediately upon acceptance by the County, including any broken branches, thinning small branches and tipping back main branches (except main leaders).

H. Excess soil and debris shall be disposed of off the project site unless ordered stockpiled by the County.

3.02 NORMAL MAINTENANCE OF PLANT MATERIALS

A. Plant material maintenance shall begin when planting operations start and shall extend until final acceptance of work.

B. Maintain all plant materials under this Contract to the satisfaction of the County. Maintenance shall include necessary watering, cultivation, weeding, pruning, spraying, tightening and repair to guy wires, removal of dead material, resetting, and other work required to conform with referenced standards and accepted nursery standards as approved.

C. Plant materials which are in a tilted or in a leaning position shall be properly righted.

D. After final acceptance by the County and until one calendar year after acceptance of all plantings, the landscaping contractor or subcontractor shall make monthly inspections of materials and report in writing to the County the conditions of the plants and the necessary requirements to keep the plants in a healthy growing condition.

3.03 TREE AND PLANT PROTECTION

A. The Contractor shall remove all trees (if any) within the limit of landscaping shown on the detail sheet except those designated to be salvaged (if any). Prior to removal of said trees, the Contractor shall obtain a tree removal permit, if required. All other trees in the vicinity of the work shall be protected against damage by the Contractor until all work under the Contract has been completed.

B. Consult with the County, and remove agreed-on roots and branches which interfere with construction. Employ qualified tree surgeon to remove, and to treat cuts.

C. Provide temporary barriers to a height of six feet around each group of trees and plants.

D. Protect root zones of trees and plants

1. Do not allow vehicular traffic or parking.
2. Do not store materials or products.
3. Prevent dumping or refuse or chemically injurious materials or liquids.
4. Prevent puddling or continuous running water.

E. Carefully supervise excavating, grading, and filling, and subsequent construction operations, to prevent damage.

F. In case of inadvertent damage to any tree or plant by the Contractor or any of his subcontractors or employees, the Contractor shall provide replacement of each such damaged tree or plant with a new one of acceptable type, size and quality.

G. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by the County.

H. Clean and repair damage caused by installation, fill and grade the areas of the site to required elevations and slopes, and clean the area.

3.04 GUARANTEE

The life and satisfactory condition of all plant material planted shall be guaranteed by the Contractor for a minimum of one calendar year. Guarantee shall include complete replacement with material of the same kind and size as in the original work if not in a healthy condition, as determined by the County, at the end of the guarantee period.

3.05 REPLACEMENT

A. At the end of the guarantee period, any plant required under this Contract that is dead or not in satisfactory growth as determined by the County, shall be removed. Plants replaced shall be guaranteed for 90 days after date of replacement.

B. Replacement of plants necessary during guarantee period shall be the responsibility of the Contractor, except for possible replacements of plants resulting from removal, vandalism, acts of neglect on the part of others, or acts of God.

C. All replacements shall be plants of the same kind and size as specified in the Drawings. They shall be furnished and planted as herein specified. The cost shall be the responsibility of the Contractor.

END OF SECTION

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SECTION 02485

SEEDING AND SODDING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials and equipment necessary to satisfactorily return all construction areas to their original conditions or better.

B. Work shall include furnishing and placing seed or sod, fertilizing, planting, watering and maintenance until acceptance by County.

1.02 RELATED WORK NOT INCLUDED

Excavation, filling and grading required to establish elevation shown on the Drawings are included under other sections of these Specifications.

1.03 QUALITY ASSURANCE

A. It is the intent of this Specification that the Contractor is obliged to deliver a satisfactory stand 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 County until a satisfactory stand is obtained. For purposes of grassing, a satisfactory stand of grass is herein defined as a full lawn cover over areas to be sodded or seeded, with grass free of weeds, alive and growing, leaving no bare spots larger than 3/4 square yard within a radius of 8 feet.

B. All previously grassed areas where pipelines are laid shall be sodded. All sodding and grassing shall be installed in accordance with these Specifications or as directed by the County.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fertilizer: The fertilizer shall be of the slow-release type meeting the following minimum requirements: 12 percent nitrogen, 8 percent phosphorus, 8 percent potassium; 40 percent other available materials derived from organic sources. At least 50 percent of the phosphoric acid shall be from normal super phosphate or an equivalent source which will provide a minimum of two units of sulfur. The amount of sulfur shall be indicated on the quantitive analysis card attached to each bag or other container. Fertilizer shall be uniform in composition, dry and free flowing delivered to sites in original unopened containers bearing manufacturer's statement or guarantee.

B. Seeding/Grassing: 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, except that no additional payment will be made for mulching, fertilizing and/or watering.

C. Sodding: Sod shall be provided as required on the construction drawings or at locations as directed by the County in accordance with Florida Department of Transportation, Specifications Section 575 and 981. The Contractor shall furnish bahia grass sod or match existing sod. Placement and watering requirements shall be in accordance with FDOT Specifications Section 575, except that no additional payment will be made for placement and/or watering. This cost shall be included in the Contract price bid for sodding.

D. Topsoil: Topsoil stockpiled during excavation may be used as necessary. If additional topsoil is required to replace topsoil removed during construction, it shall be obtained off site at no additional cost to the County. Topsoil shall be fertile, natural surface soil, capable of producing all trees, plants and grassing specified herein.

E. Water: 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 that 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. When the trench backfill has stabilized sufficiently, the Contractor shall commence work on lawns and grassed areas, including fine grading as necessary and as directed by the County.

B. Finish Grading: Areas to be seeded or sodded shall be finish graded, raked, and debris removed. Soft spots and uneven grades shall be eliminated. The County shall approve the finish grade of all areas to be seeded or sodded prior to seed or sod application.

C. Protection: Seeded and sodded areas shall be protected against traffic or other use by placing warning signs or erecting barricades as necessary. Any areas damaged prior to acceptance by the County shall be repaired by the Contractor as directed by the County.

3.02 CLEANUP

Soil 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 construction by the Contractor shall be restored or replaced as directed by the County.

B. Maintain landscape work for a period of 90 days immediately following complete installation of work or until County accepts project. Watering, weeding, cultivating, restoration of grade, mowing and trimming, protection from insects and diseases, fertilizing and similar operations as needed to ensure normal growth and good health for live plant material shall be included at no additional cost to the County.

3.04 REPAIRS TO LAWN AREAS DISTURBED BY CONTRACTOR'S OPERATORS

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 sodding, in accordance with these Specifications.

END OF SECTION

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SECTION 02513

ASPHALT CONCRETE PAVING

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials and equipment necessary to complete all milling asphalt pavement and asphalt concrete paving (including restoration of driveways) as called out on the Contract Documents or as shown on the Drawings.

1.02 QUALITY ASSURANCE

A. Qualifications of Asphalt Concrete Producer: The only materials permitted shall be furnished by a bulk asphalt concrete producer exclusively engaged in the production of hot-mix, hot-laid asphalt concrete.

B. Qualification of Testing Agency: The County may employ a commercial testing laboratory to conduct tests and evaluations of asphalt concrete materials and design. The Contractor shall:

1. Provide asphalt concrete testing and inspection service acceptable to County.
2. Include sampling and testing asphalt concrete materials proposed, and tests and calculations for asphalt concrete mixtures.
3. Provide field testing facilities for quality control testing during paving operations.

C. Requirements of Regulatory Agencies: The Contractor shall comply with the applicable requirements of:

1. Manatee County Utility Operations Department
2. Manatee County Transportation Department
3. State of Florida Dept. of Transportation

1.03 PAVING QUALITY REQUIREMENTS

A. General: In addition to other specified conditions, the Contractor shall comply with the following minimum requirements:

1. In-place asphalt concrete course shall be tested for compliance with requirements for density, thickness and surface smoothness.
2. Final surface shall be provided of uniform texture, conforming to required grades and cross sections.
3. A minimum of four inch diameter pavement specimens for each completed course shall be taken from locations as directed by the County.
4. Holes from test specimens shall be repaved as specified for patching defective work.

B. Density:

1. When subjected to 50 blows of standard Marshall hammer on each side of an in place material specimen, densities shall be comparable to a laboratory specimen of same asphalt concrete mixture.
2. The minimum acceptable density of in-place course material shall be 98% of the recorded laboratory specimen density.

C. Thickness: In-place compacted thicknesses shall not be acceptable if less than the minimum thicknesses shown on the Drawings.

D. Surface Smoothness:

1. Finished surface of each asphalt concrete course shall be tested for smoothness, using a 10 ft. straightedge applied parallel to and at right angles to centerline of paved areas.
2. Surface areas shall be checked at intervals directed by County.
3. Surfaces shall not be acceptable if they exceed the following:
   a. Base Course: 1/4 in. in 10 ft.
   b. Surface Course: 3/16 in. in 10 ft.
   c. Crowned Surfaces:
      (1) Test crowned surfaces with a crown template, centered and at right angles to the crown.
      (2) Surfaces will not be acceptable if varying more than 1/4 in. from the template.

1.04 SUBMITTALS

A. Samples: The Contractor may be required to provide samples of materials for laboratory testing and job-mix design.

B. Test Reports: The Contractor shall submit laboratory reports for following materials tests:

1. Coarse and fine aggregates from each material source and each required grading:
   a. Sieve Analysis: ASTM C 136 (AASHO T 27).
   b. Unit Weight of Slag: ASTM C29 (AASHO T 19).
   c. Soundness: ASTM C 88 (AASHO T 104) for surface course aggregates only.
   d. Sand Equivalent: ASTM D 2419 (AASHO T 176).
   e. Abrasion of Coarse Aggregate: ASTM C131 (AASHO T 96),for surface course aggregates only.
2. Asphalt cement for each penetration grade:
   a. Penetration: ASTM D5 (AASHO T49).
   b. Viscosity (Kinematic): ASTM D2170 (AASHO T 201).
   c. Flash Point: ASTM D92 (AASHO T 48).
   d. Ductility: ASTM D 113 (AASHO T 51).
   e. Solubility: ASTM D 4 (AASHO T 44).
   f. Specific Gravity: ASTM D 70 (AASHO T 43).

3. Job-mix design mixtures for each material or grade:
   a. Bulk Specific Gravity for Coarse Aggregate: ASTM C 117(AASHO T 85).
   b. Bulk Specific Gravity for Fine Aggregate: ASTM C 128(AASHO T 84).
4. Uncompacted asphalt concrete mix: Maximum Specific Gravity: ASTM D 2041 (AASHO T 209).
5. Compacted asphalt concrete mix:
   a. Bulk Density: ASTM D 1188 (AASHO T 166).
   b. Marshall Stability and Flow: ASTM D 1559.
6. Density and voids analysis:
   a. Provide each series of asphalt concrete mixture text specimens, in accordance with A.I. MS-2 "Mix Design Methods for Asphalt Concrete".
   b. Use Marshall method of mix design unless otherwise directed or acceptable to the County.
   c. Report the quantity of absorbed asphalt cement in pounds of dry aggregate, percent air voids, and percent voids in mineral aggregate.
7. Sampling and testing of asphalt concrete mixtures for quality control during paving operations:
   a. Uncompacted asphalt concrete mix.
      (1) Asphalt Cement Content: ASTM D 2172 (AASHO T 164).
      (2) Penetration of Recovered Asphalt Cement: ASTM D 5(AASHO T 49).
      (3) Ductibility of Recovered Asphalt Cement: ASTM D 113(AASHO T 51).
   b. Compacted asphalt concrete mix:
      (1) Bulk Density: ASTM D 1188 (AASHO T 166).
      Marshall Stability and Flow: ASTM D1559).
   c. Perform at least one test for each day's paving.
8. Asphalt plant inspection: ASTM D 290.
9. Additional testing:
   a. Retesting shall be required if previous tests indicate insufficient values, or if directed by the County.
   b. Testing shall continue until specified values have been attained.
10. Asphalt concrete materials which do not comply with specified requirements shall not be permitted in the work.

1.05 JOB CONDITIONS

A. Weather Limitations:

1. Apply bituminous prime and tack coats only when the ambient temperature in the shade is 50 degrees F. and when the temperature has not been below 35 degrees F. for 12 hours immediately prior to application.
2. Do not apply when the base surface is wet or contains an excess of moisture which would prevent uniform distribution and the required penetration.
3. Construct asphalt concrete surface course only when atmospheric temperature is above 40 degrees F., when the underlying base is dry, and when weather is not rainy.
4. Base course may be placed when air temperature is not below 30 degrees F. and rising, when acceptable to the County.

B. Grade Control: Establish and maintain the required lines and grades, including crown and cross-slope, for each course during construction operations.

C. Traffic Control: Maintain vehicular and pedestrian traffic during paving operations, as required for other construction activities.

PART 2 PRODUCTS

2.01 MATERIALS

A. Soil Cement or Shell Base Course: as specified in FDOT Section 270, "Material for Base and Stabilized Base", and as called for in the Contract Documents.

B. Aggregate for Asphalt Concrete, General:

1. Sound, angular crushed stone, crushed gravel, or crushed slag: ASTM D 692.
2. Sand, stone, or slag screening: ASTM D 1073.
3. Provide aggregate in gradations for various courses to comply with local highway standards.

C. Surface Course Aggregates:

1. Provide natural sand, unless sand prepared from stone, slag, or gravel or combinations are required to suit local conditions.

D. Asphalt Cement: Comply with ASTM D 946 for 85-100 penetration grade.

E. Prime Coat:

1. Cut-back liquid asphalt.
2. Medium-Curing type: ASTM D 2027, Grade MC-70.

2.02 ASPHALT-AGGREGATE MIXTURES

A. Job-mix criteria:

1. Provide job-mix formulas for each required asphalt-aggregate mixture.
2. Establish a single percentage of aggregate passing each required sieve size, a single percentage of asphalt cement to be added to aggregate, and a single temperature at which asphalt concrete is to be produced.
3. Comply with the mix requirements of local governing highway standards.
4. Maintain material quantities within allowable tolerances of the governing standards.

2.03 TRAFFIC AND PARKING MARKING MATERIALS

A. Traffic lane marking paint with chlorinated rubber base.

B. Factory mixed, quick drying and non-bleeding, FS TT-P-115C, Type III.

C. Color: Driving Lane Dividers - White
No Parking Zone - Yellow
Parking Dividers - White

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. Subbase Preparation:

1. The Contractor shall remove from the area all organic substance encountered to a depth of six or eight inches (6" or 8"), or to such depth and width as directed by the County. The entire area shall be plowed and dragged prior to placing a stabilizing additive, if required to meet minimum bearing value.
2. Subbase shall be compacted to a minimum density of 98 percent of the maximum as determined by the Modified Proctor Density AASHTO T180, and shall have a minimum bearing value of 40 pounds per square inch as determined by the Florida Bearing Test.

B. Base Course:

1. Check subgrade for conformity with elevations and section immediately before placing base material.
2. Place base material in compacted layers not more than 6 inches thick, unless continuing tests indicate the required results are being obtained with thicker layers.
3. In no case will more than 8-inches of compacted base be placed in one lift.
4. Spread, shape, and compact all base material deposited on the subgrade during the same day.
5. Compact base course material to be not less than 95% of maximum density: ASTM D 1557, Method D (98 percent maximum density: AASHTO T-180).
6. Test density of compacted base course: ASTM D 2167.
7 Conduct one test for each 250 sq. yds. of in-place material, but in no case not less than one daily for each layer.

C. Loose and Foreign Material:

1. Remove loose and foreign material from compacted subbase surface immediately before application of paving.
2. Use power brooms or blowers, and brooming as required.
3. Do not displace subbase material.

D. Prime Coat:

1. Uniformly apply at rate of 0.20 to 0.5 gal. per sq. yd. over compacted and cleaned subbase surface.
2. Apply enough material to penetrate and seal, but not flood the surface.
3. Allow to cure and dry as long as required to attain penetration and evaporation of volatile, and in no case less than 24 hours unless otherwise acceptable to the County.
4. Blot excess asphalt with just enough sand to prevent pick-up under traffic.
5. Remove loose sand before paving.

E. Tack Coat:

1. Dilute material with equal parts of water and apply to contact surfaces of previously constructed asphalt concrete or portland cement concrete and similar surfaces.
2. Apply at rate of 0.05 to 0.15 gal. per sq. yd. of surface.
3. Apply tack coat by brush to contact surfaces of structures projecting into or abutting asphalt concrete pavement.
4. Allow surfaces to dry until material is at condition of tackiness to receive pavement.

3.02 MANHOLE FRAME / VALVE BOX ADJUSTMENTS (IF APPLICABLE)

A. Placing Manhole frames:

1. Surround manhole frames set to elevation with a ring of compacted asphalt concrete base prior to paving.
2. Place asphalt concrete mixture up to 1 in. below top of frame, slope to grade, and compact by hand tamping.

B. Adjust manhole frames to proper position to meet paving.

C. If permanent covers are not in place, provide temporary covers over openings until completion of rolling operations.

D. Set cover manhole frames to grade, flush with surface of adjacent pavement.

3.03 PREPARING THE MIXTURE

A. Comply with ASTM D 995 for material storage, control, and mixing, and for plant equipment and operation.

B. Stockpiles:

1. Keep each component of the various-sized combined aggregates in separate stockpiles.
2. Maintain stockpiles so that separate aggregate sizes shall not be intermixed.

C. Heating:

1. Heat the asphalt cement at the mixing plant to viscosity at which it can be uniformly distributed throughout mixture
2. Use lowest possible temperature to suit temperature-viscosity characteristics of asphalt.
3. Do not exceed 350 degrees F. (176.6 degrees C.).

D. Aggregate:

1. Heat-dry aggregates to reduce moisture content to not more than 2.0%.
2. Deliver dry aggregate to mixer at recommended temperature to suit penetration grade and viscosity characteristics of asphalt cement, ambient temperature, and workability of mixture.

3. Accurately weigh or measure dry aggregates and weigh or meter asphalt cement to comply with job-mix formula requirements.

E. Mix aggregate and asphalt cement to achieve 90-95% of coated particles for base mixtures and 85-90% of coated particles for surface mixture, when tested in accordance with ASTM D 2489.

F. Transporting:

1. Transport asphalt concrete mixtures from mixing site in trucks having tight, clean compartments.
2. Coat hauling compartments with a lime-water mixture to prevent asphalt concrete mixture from sticking.
3. Elevate and drain compartment of excess solution before loading mix.
4. Provide covers over asphalt concrete mixture when transporting to protect from weather and to prevent loss of heat.
5. During periods of cold weather or for long-distance deliveries, provide insulation around entire truck bed surfaces.

3.04 EQUIPMENT

A. Provide size and quantity of equipment to complete the work specified within project time schedule.

B. Bituminous Pavers: Self-propelled that spread hot asphalt concrete mixtures without tearing, shoving or gouging surfaces, and control pavement edges to true lines without use of stationary forms.

C. Rolling Equipment:

1. Self-propelled, steel-wheeled and pneumatic-tired rollers that can reverse direction without backlash.
2. Other type rollers may be used if acceptable to the County.

D. Hand Tools: Provide rakes, lutes, shovels, tampers, smoothing irons, pavement cutters, portable heaters, and other miscellaneous small tools to complete the work specified.

3.05 PLACING THE MIX

A. Place asphalt concrete mixture on prepared surface, spread and strike-off using paving machine.

B. Spread mixture at a minimum temperature of 225 degrees F. (107.2 degrees C.).
C. Inaccessible and small areas may be placed by hand.

D. Place each course at thickness so that when compacted, it will conform to the indicated grade, cross-section, finish thickness, and density indicated.

E. Paver Placing:

1. Unless otherwise directed, begin placing along centerline of areas to be paved on crowned section, and at high side of sections on one-way slope, and in direction of traffic flow.
2. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.
3. Complete base courses for a section before placing surface courses.
4. Place mixture in continuous operation as practicable.

F. Hand Placing:

1. Spread, tamp, and finish mixture using hand tools in areas where machine spreading is not possible, as acceptable to County.
2. Place mixture at a rate that will insure handling and compaction before mixture becomes cooler than acceptable working temperature.

G. Joints:

1. Carefully make joints between old and new pavements, or between successive days' work, to ensure a continuous bond between adjoining work.
2. Construct joints to have same texture, density and smoothness as adjacent sections of asphalt concrete course.
3. Clean contact surfaces free of sand, dirt, or other objectionable material and apply tack coat.
4. Offset transverse joints in succeeding courses not less than 24 inches.
5. Cut back edge of previously placed course to expose an even, vertical surface for full course thickness.
6. Offset longitudinal joints in succeeding courses not less than 6 inches.
7. When the edges of longitudinal joints are irregular, honeycombed, or inadequately compacted, cut back unsatisfactory sections to expose an even, vertical surface for full course thickness.

3.06 COMPACTING THE MIX

A. Provide sufficient rollers to obtain the required pavement density.

B. Begin rolling operations as soon after placing when the mixture will bear weight of roller without excessive displacement.

C. Do not permit heavy equipment, including rollers to stand on finished surface before it has thoroughly cooled or set.

D. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

E. Start rolling longitudinally at extreme lower side of sections and proceed toward center of pavement. Roll to slightly different lengths on alternate roller runs.

F. Do not roll centers of sections first under any circumstances.

G. Breakdown Rolling:

1. Accomplish breakdown or initial rolling immediately following rolling of transverse and longitudinal joints and outside edge.
2. Operate rollers as close as possible to paver without causing pavement displacement.
3. Check crown, grade, and smoothness after breakdown rolling.
4. Repair displaced areas by loosening at once with lutes or rakes and filling, if required, with hot loose material before continuing rolling.

A. Second Rolling:

1. Follow breakdown rolling as soon as possible, while mixture is hot and in condition for compaction.
2. Continue second rolling until mixture has been thoroughly compacted.

I. Finish Rolling:

1. Perform finish rolling while mixture is still warm enough for removal of roller marks.
2. Continue rolling until roller marks are eliminated and course has attained specified density.

J. Patching:

1. Remove and replace defective areas.
2. Cut-out and fill with fresh, hot asphalt concrete.
3. Compact by rolling to specified surface density and smoothness.
4. Remove deficient areas for full depth of course.
5. Cut sides perpendicular and parallel to direction of traffic with edges vertical.
6. Apply tack coat to exposed surfaces before placing new asphalt concrete mixture.

3.07 MARKING ASPHALT CONCRETE PAVEMENT

A. Cleaning:

1. Sweep surface with power broom supplemented by hand brooms to remove loose material and dirt.
2. Do not begin marking asphalt concrete pavement until acceptable to the County.

B. Apply paint with mechanical equipment.

1. Provide uniform straight edges.
2. Not less than two separate coats in accordance with manufacturer's recommended rates.

3.08 CLEANING AND PROTECTION

A. Cleaning: After completion of paving operations, clean surfaces of excess or spilled asphalt materials to the satisfaction of the County.

B. Protection:

1. After final rolling, do not permit vehicular traffic on asphalt concrete pavement until it has cooled and hardened, and in no case sooner than 6 hours.
2. Provide barricades and warning devices as required to protect pavement.
3. Cover openings of structures in the area of paving until permanent coverings are placed (if applicable).

END OF SECTION

SECTION 02575

PAVEMENT REPAIR AND RESTORATION

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment, obtain County or State right-of-way permits and incidentals required and remove and replace pavements over trenches excavated for installation of water or sewer lines and appurtenances as shown on the Contract Drawings.

1.02 GENERAL

A. The Contractor shall take before and after photographs.

B. The Contractor shall repair in a manner satisfactory to the County or State, all damage done to existing structures, pavement, driveways, paved areas, curbs and gutters, sidewalks, shrubbery, grass, trees, utility poles, utility pipe lines, conduits, drains, catch basin, flagstones, or stabilized areas or driveways and including all obstructions not specifically named herein, which results from this Project.

C. The Contractor shall keep the surface of the backfilled area of excavation in a safe traffic bearing condition and firm 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 requirements of Manatee County Transportation Department requirements for pavement repair and as described herein, including all base, subbase and asphalt replacement.

D. All materials and workmanship shall meet or exceed the County requirements and as called for in the Contract Documents and nothing herein shall be construed as to relieve the Contractor from this responsibility.

E. All street, road and highway repair shall be made in accordance with the FDOT and County details indicated on the Drawings and in accordance with the applicable requirements and approval of affected County and State agencies.

PART 2 PRODUCTS

2.01 PAVEMENT SECTION

A. Asphaltic concrete shall consist of asphalt cement, coarse aggregate, fine aggregate and mineral filler conforming to FDOT Type S-III Asphalt. Pavement replacement thickness shall match that removed but in no case shall be less than 1-1/2” compacted thickness. All asphalt concrete pavement shall be furnished, installed and tested in accordance with FDOT Specifications for Road and Bridge Construction.

B. Asphalt or crushed concrete or approved equal base material shall be furnished and installed under all pavement sections restored under this Contract. Asphalt base shall have a minimum 6" compacted thickness, meet requirements for FDOT ABC III (Minimum Marshall Stability of 1000) and be furnished, installed and tested in accordance with the requirements of the FDOT Standards. Crushed concrete base shall be 10" minimum compacted thickness. Crushed concrete aggregate material shall have a minimum LBR of 140 compacted to 98% T-180 AASHTO density. Asphalt base and crushed concrete base are acceptable. Other bases shall be submitted for approval.

C. Prime and tack will be required and applied in accordance with Section 300 - FDOT Specifications: Prime and Tack Coat for Base Courses.

PART 3 EXECUTION

3.01 CUTTING PAVEMENT

A. The Contractor shall saw cut in straight lines and remove pavement as necessary to install the new pipelines and appurtenances and for making connections to existing pipelines.

B. Prior to pavement removal, the Contractor shall mark the pavement for cuts nearly paralleling pipe lines and existing street lines. Asphalt pavement shall be cut along the markings with a rotary saw or other suitable tool. Concrete pavement shall be scored to a depth of approximately two (2) inches below the surface of the concrete along the marked cuts. Scoring shall be done by use of a rotary saw, after which the pavement may be broken below the scoring with a jackhammer or other suitable equipment.

C. The Contractor shall not machine pull the pavement until it is completely broken and separated along the marked cuts.

D. The pavement adjacent to pipe line trenches shall neither be disturbed nor damaged. If the adjacent pavement is disturbed or damaged, irrespective of cause, the Contractor shall remove and replace the pavement. In addition, the base and sub-base shall be restored in accordance with these Specifications, Florida Dept. of Transportation Standard Specifications and as directed by the County.

3.02 PAVEMENT REPAIR AND REPLACEMENT

A. The Contractor shall repair, to meet or exceed original surface material, all existing concrete or asphaltic pavement, driveways, or sidewalks cut or damaged by construction under this Contract. He shall match the original grade unless otherwise specified or shown on the Drawings. Materials and construction procedures for base course and pavement repair shall conform to those of the Florida Dept. of Transportation.

B. The Contractor's repair shall include the preparation of the subbase and base, place and maintain the roadway surface, any special requirements whether specifically called for or implied and all work necessary for a satisfactory completion of this work. Stabilized roads and drives shall be finished to match the existing grade. Dirt roads and drives shall have the required depth of backfill material as shown on the Contract Drawings.

C. The asphaltic concrete repairs shall be in accordance with the Manatee County Public Works Standards, Part I Utilities Standards Manual, Detail UG-12. The asphaltic concrete repairs shall extend the full width and length of the excavation or to the limits of any damaged section. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other approved method so as to provide a clean edge to abut the repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities. The existing asphalt beyond the excavation or damaged section shall be milled 25' back from the saw cut. Final overlay shall match existing with no discernable "bump" at joint.

3.03 MISCELLANEOUS RESTORATION

Sidewalks or driveways cut or damaged by construction shall be restored in full sections or blocks to a minimum thickness of four inches. Concrete curb or curb and gutter shall be restored to the existing height and cross section in full sections or lengths between joints. RCP pipe shall be repaired or installed in accordance with manufacturer's specifications. Grassed yards, shoulders and parkways shall be restored to match the existing sections with grass sod of a type matching the existing grass.

3.04 SPECIAL REQUIREMENTS

The restoration of all surfaces, as described herein, disturbed by the installation of pipelines shall be completed as soon as is reasonable and practical. The complete and final restoration of both paved and shell stabilized roads within a reasonable time frame is of paramount importance. To this end, the Contractor shall, as part of his work schedule, complete the restoration of any area of road within five weeks after removing the original surface. Successful leak testing shall be performed prior to restoring any area of road. All restoration and replacement or repairs are the responsibility of the Contractor.

3.05 CLEANUP

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.

3.06 MAINTENANCE OR REPAIR

All wearing surfaces shall be maintained by the Contractor in good order suitable for traffic prior to completion and acceptance of the work.

END OF SECTION

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SECTION 02615

DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment and incidentals required to install ductile iron pipe and restrained joint ductile iron pipe and cast iron or ductile iron restrained joint fittings, complete, as shown on the Drawings and specified in these Standards.

B. Fittings are noted on the drawings for the Contractor's convenience and do not relieve him from laying and jointing different or additional items where required.

C. The Contractor shall furnish all labor, materials, equipment and incidentals required to install push-on joint or restrained joint ductile iron pipe, complete as shown on the Drawings and Specifications.

D. Newly installed pipe shall be kept clean and free of all foreign matter. All DI pipe installed underground shall be poly wrapped unless noted otherwise on the plans.

1.02 SUBMITTALS

A. The Contractor shall submit to the County, within ten days after receipt of Notice to Proceed, a list of materials to be furnished, the names of the suppliers and the appropriate shop drawings for all ductile iron pipe and fittings.

B. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable sections of the Specifications.

PART 2 PRODUCTS

2.01 MATERIALS

A. Ductile iron pipe shall conform to ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51. Thickness of pipe shall be Class 50 or pressure Class 350. All pipe not buried shall be Class 53. All ductile iron pipe shall be clearly marked on the outside of the barrel to readily identify it from cast iron.

B. Unrestrained joint pipe shall be supplied in lengths not to exceed 21 feet. Unless otherwise called for in the Contract Documents, unrestrained joint pipe shall be either the rubber-ring type push-on joint or standard mechanical joint pipe as manufactured by the American Cast Iron Pipe Company, U.S. Pipe and Foundry Company, or approved equal.

C. All mechanical joint fittings shall be pressure rated for 350 psi and meet the requirement of AWWA C110 or AWWA C153 except flanged fittings shall be rated for 250 psi. Rubber gaskets shall conform to AWWA C111 for mechanical and push-on type joints and shall be EPDM (Ethylene-Propylene Diene Monomer) rubber for potable water and reclaimed water pipelines. Standard gaskets shall be such as Fastite as manufactured by American Cast Iron Pipe Company, or an approved equal. Acrylonitrile butadiene (NBR) gaskets shall be used for potable water mains that are located in soil that is contaminated with low molecular-weight petroleum products or non-chlorinated organic solvents or non-aromatic organic solvents. Fluorocarbon (FKM) gaskets shall be used for potable water mains that are located in soil that is contaminated with aromatic hydrocarbons or chlorinated hydrocarbons. Fluorocarbon (FKM) gaskets shall be used where both classes of contaminates are found.

D. Water Main and Reclaimed Water Main Coatings: All ductile iron pipe used in water and reclaimed water systems shall have a standard thickness cement lining on the inside in accordance with AWWA C104 and a standard 1-mil asphaltic exterior coating per AWWA C151. All ductile iron or gray iron fittings used in water and reclaimed water systems shall have standard thickness cement linings on the inside per AWWA C104 and an asphaltic exterior coating or they shall have factory-applied fusion bonded epoxy coatings both inside and outside in accordance with AWWA C550.

E. Wastewater Main Coatings: All ductile iron pipe and fittings used in wastewater sewer systems shall have a factory applied dry film thickness 40-mil Protecto 401 or 40-mil Novocoat SP2000W amine cured novalac ceramic epoxy lining on the inside. The interior lining application is to be based on the manufacturer's recommendation for long-term exposure to raw sewage. To ensure a holiday-free lining, documentation must be provided, prior to shipment, showing each section of lined pipe has passed holiday testing at the time of production per ASTM G62. The lining shall have a minimum ten year warranty covering failure of the lining and bond failure between liner and pipe. Exterior coatings for ductile iron pipe and fittings used in wastewater systems shall be either an asphaltic coating per AWWA C151 or a factory-applied epoxy coating per AWWA C550.

F. Restrained joints shall be provided at all horizontal and vertical bends and fittings, at casings under roads and railroads and at other locations shown on the Contract Drawings. Restrained joint pipe fittings shall be designed and rated for the following pressures: 350 psi for pipe sizes up to and including 24" diameter; 250 psi for pipe sizes 30" diameter and above.

2.02 IDENTIFICATION

A. Each length of pipe and each fitting shall be marked with the name of the manufacturer, size and class and shall be clearly identified as ductile iron pipe. All gaskets shall be marked with the name of the manufacturer, size and proper insertion direction.

B. Pipe shall be polyethylene-wrapped blue for water mains, purple (Pantone 522 C) for reclaimed water mains and green for sewer mains, per AWWA C105. Pipe need not be entirely polyethylene wrapped if soil testing, which is performed by the Engineer of Record or the Contractor in accordance with AWWA C105, indicates that the soil at the site is not corrosive. If soil testing indicates that the soil at the site is not corrosive, pipe may be spiral wrapped with color coded polyethylene at a six-inch minimum spacing, or the ductile iron pipe (DIP) may be painted with a minimum 1-inch wide color coded stripe on the top and both sides of the DIP.

C. All above ground potable water mains and appurtenances shall be painted safety blue.

END OF SECTION

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SECTION 02617

INSTALLATION AND TESTING OF PRESSURE PIPE

PART 1 GENERAL

1.01 INSTALLING PIPE AND FITTINGS

A. The Contractor shall install all pipe in accordance with the recommendations of the pipe manufacturer and as specified herein.

B. The Contractor shall take care in handling, storage and installation of pipe and fittings to prevent injury to the pipe or coatings. All pipe and fittings shall be examined before installation and pipe which is deemed to be defective by the County shall not be installed.

C. The Contractor shall thoroughly clean and keep thoroughly clean, all pipe and fittings prior to during and after installation.

D. The Contractor shall lay the pipe to the lines and grades shown on the Contract Drawings with bedding and backfill as shown on the Drawings or called out in the Contract Documents. Blocking under the pipe shall not be permitted except through casing sleeves.

E. The Contractor shall keep the open ends of all pipe closed with a tightly fitting plug when installation is not in progress or the potential exists for dirt or debris to enter the pipe.

F. The pipe or accessories shall not be dropped into the trench under any circumstances.

G. The Contractor shall construct all water mains pursuant to the provisions of "Recommended Standards for Water Works", Part 8, incorporated by reference in Rule 17-555.330(3), F.A.C.

H. As a marker for the Surveyor, a PVC pipe marker or 2” x 4” marker shall be inserted by the Contractor on the top of pipe for potable water mains, reclaimed water mains and sanitary force mains at intervals no greater than 200 feet apart and at locations where there is a substantial grade change. The pipe markers shall indicate the pipe diameter and shall be labeled PWM in “safety” blue, RWM in purple, and FM in green, for potable water mains, reclaimed water mains and sanitary force mains, respectively. As a marker for the Surveyor, a PVC pipe marker or 2” x 4” marker shall be inserted by the Contractor on the top of all pipe fittings (other than sanitary sewer service wyes, potable water saddles and reclaimed water saddles). The markers for fittings shall indicate the type of fitting and shall be labeled PWF in “safety” blue, RWF in purple, and FMF in green, for potable water fittings, reclaimed water fittings, and sanitary force main fittings, respectively. The Contractor is responsible for making the aforementioned markers available to the Surveyor. The Contractor shall field locate the mains and fittings when markers are not made available to the Surveyor.

I. A PVC pipe marker or 2” x 4” marker shall be inserted by the Contractor at the beginning and end of each horizontal directional drill (HDD). The HDD Contractor shall provide a certified report and bore log indicating the horizontal and vertical location every 25 linear feet or less along the pipe.

J. A 2” PVC pipe marker with a painted end cap shall be inserted by the Contractor at the ROW line indicating each individual new service location or stub out. The marker shall be a 6 foot length of PVC pipe inserted 2 feet into the ground and shall be painted “safety” blue for potable water, purple for reclaimed water, and green for sewer.

1.02 PROCEDURE FOR TESTING WATER LINES, FORCE MAINS AND RECLAIMED WATER LINES

A. A 48-hour notice is needed prior to testing. A letter stating the reasons testing should be scheduled ahead of other jobs must accompany all emergency testing requests.

B. County and Contractor must be present for all testing, except for testing tapping valves and sleeves.

C. All pressure pipe lines shall remain undisturbed for 24 hours to develop complete strength at all joints. All pipe lines shall be subjected to a hydrostatic pressure test for two (2) hours at full working pressure, but not less than 180 psi for water/reclaimed (150 psi for force main). Maximum length of pipe to be tested at one time is 2,600 feet. If line is longer than 2,600 feet and cannot be sectioned in 2,600 feet (max.) lengths, the allowable leakage will be figured at 2,600 feet.

D. Allowable leakage shall be determined by AWWA C600 table for hydrostatic tests. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof; to maintain the test pressure after the air in the pipe line has been expelled and the pipe has been filled with water.

E. All digging on the job site in the right-of-way must be completed before any testing of water or sewer. Any digging or boring across water or sewer lines after they have been tested may result in a retest of the lines at the County's request.

F. If any revisions or changes are made after initial testing, lines will be re-tested at the County's request.

G. Disconnect water supply during test.

H. All force mains will be tested from the valves in the valve vault at the lift station to the point of connection whether it be against a valve on another force main or into a manhole.

I. All services to be aboveground during test. The services should be the correct length so they will be one (1) foot inside right-of-way line.

J. All fire hydrant gate valves to be open during test.

K. All visible leaks are to be repaired, regardless of the amount of leakage.

L. Check gauge pressure periodically during test. If test pressure drops to 175 psi for water/reclaimed lines or to 145 psi for force mains during test, the line must be repumped back to 180 psi for water/reclaimed (150 psi force mains) and the amount of leakage measured. The test will continue on with the remaining time left. At the end of the test, the line must be repumped again back to 180 psi (150 psi for force main) and the amount of leakage measured and added to any previous leakage determined earlier in the test.

M. After the line passes the test, the pressure will be blown off from the opposite end of line from the gauge location. Fire hydrants, services and end-of-line blow offs will be opened to demonstrate they were on line during the test.

N. At end of test, the test gauge must return to zero. The pressure gauge must read 0 psi to a maximum of 300 psi in 5 psi increments.

O. The section of line being tested must be identified on the charge sheet. The length and size of pipe, the exact area being tested and the valves being tested against, must be identified. Use Station numbers if available.

P. A punch list must be made at the end of all tests.

Q. A copy of the charge sheet will be given to the County and the Contractor at the end of the test.

1.03 INSPECTION/TESTING PROCEDURE COVERING BORED PIPE LINES OR CASING AND CONDUITS INSTALLED ACROSS PREVIOUSLY TESTED AND/OR COUNTY ACCEPTED WATER AND SEWER PIPE WITHIN DEVELOPMENT PROJECTS UNDER ACTIVE CONSTRUCTION

A. Prior to testing water and sewer lines, every effort will be made to install sleeves for underground utilities that will cross these water and sewer lines or services.

B. Where it has not been possible to pre-install sleeves prior to testing and bores or conduits are required, it is the responsibility of the utility company and/or their Contractor performing the work to provide Manatee County Utility Operations Department or the Engineer of Record with accurate horizontal and vertical as-built information of the sleeves, bores and conduits installed by said utility company. This applies to all bores and conduits crossing water and sewer lines.

C. Procedures to be followed for installation of conduits, pipe lines and bores that will cross, or be closer than 5'-0" horizontally and 18 inches vertically to, previously tested water and sewer lines that are still under the ownership of the developer/contractor.

1. Notify the County and obtain the best as-built information available. Allow sufficient time for the County to field locate the existing pipe lines.
2. Submit drawings of proposed location to the County and Manatee County Utility Operations Dept. Utility Locations Section for review.
3. Obtain a County Right-of-Way Use Permit if the work area is within a dedicated area of right-of-way.
4. Perform installation in the presence of a County representative. Call (941) 792-8811, ext. 5061 or ext. 5069 with at least two (2) working days notice.

5. Submit two (2) copies of as-built information to the County to incorporate into the record drawings to be submitted to the County.
6. Failure to follow steps 2) thru 5) will result in additional charges for retesting the previously tested water and sewer lines.

D. Procedures to be followed for installation of conduits, pipe lines and bores crossing or closer than 5'-0" horizontally and 18 inches vertically to previously tested water and sewer lines that have been previously accepted by Manatee County:

1. Obtain record drawing information from the County.
2. If roadway has been dedicated to Manatee County, obtain Right-of-Way Use Permit and copy the Project Management Department Locations Section with proposed location drawing.
3. Follow procedures in "Sunshine State One-Call", paying special attention to the requirements of Section VII.

E. Should water or sewer lines be damaged during the bore pipe line or casing installation, the cost of any repairs and retesting will be paid for by the utility company that installed the bore. The actual clearance between a bored casing crossing a water or sewer pipe should not be less than 18 inches.

1.04 DETECTION

A. Direct buried pipe shall have 3" detectable metallic tape of the proper color placed directly above the pipe and 12" below finished grade or 6" detectable tape between 12" and 24" below finished grade.

B. Direct buried or horizontal directional drilled non-metallic pipe shall also have tracer wire installed along the pipe alignment. The tracer wire to be used shall be a solid, 10 gauge, high strength, copper clad steel wire with a polyethylene jacket of appropriate color manufactured by Copperhead Industries or Manatee County approved equal.

END OF SECTION

SECTION 02618

PIPELINE CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment and incidentals required to clean all new lines 4” and larger, and existing pipelines as specified in this specification and as indicated on the Drawings.

B. This work shall include the furnishing and installation of all pig launching and retrieval devices and the appropriate pigs for the cleaning procedure, and all necessary excavations, shutdowns, fittings and valves required.

1.02 RELATED WORK

A. The contractor is responsible for all necessary supply water.

B. The contractor is responsible for all necessary bypass pumping.

C. The contractor is responsible for the proper disposal of any materials removed from the pipe lines as a result of the cleaning procedure.

1.03 SUBMITTALS

A. The Contractor shall submit prior to construction, a cleaning plan, Shop Drawings, and layout diagram for approval to the County.

B. The Contractor shall submit to the County a list of materials to be furnished, and the names of suppliers.

1.04 QUALIFICATIONS

A. The Contractor performing this work shall be fully qualified, experienced and equipped to complete this work expeditiously and in a satisfactory manner.

B. The Contractor shall also be capable of providing crews as needed to complete this work without undue delay.

A. The County reserves the right to approve or disapprove the Contractor, based on the submitted qualifications.

PART 2 PRODUCTS

2.01 GENERAL

A. The contractor shall be responsible for furnishing pigs in sufficient numbers and sizes, of appropriate densities, coatings and configurations to properly clean the piping systems.

B. All pigs used for the cleaning of sewer or reclaimed water lines shall not be used in the cleaning of potable water lines.

2.02 MATERIALS

A. The pig launching and retrieval equipment shall be of the latest design and construction and shall include the means to maintain constant monitoring of the in-line flows and pressures of the system being cleaned and the constant location of the cleaning pigs in the system. Launching and retrieval systems shall be fabricated, designed and manufactured according to ANSI standards and capable of withstanding working pressures of 150 psi. Launching and receiving devices shall be sized one diameter larger than the system to which it will be attached with a minimum length of 2.5 times the diameter.

B. The contractor shall have available for immediate use an electronic pig detector for use in the system being cleaned to provide a means of tracking the passage of the pig in the system to locate areas of potential or suspected blockage and other disparities in the system.

C. The pig shall be constructed of elastomer polyurethane with an open cell construction and a density equal to or suitable for use in the piping system being cleaned. Pig configuration shall consist of a parabolic nose with a concave base and coated with a resilient surface material that will maintain a peripheral seal and will effectively clean the piping system without over abrading the interior pipe wall. Pig characteristics shall include the ability to navigate through 90-degree bends, 180 degree turns, bi-directional fittings, full port valves, reduce its cross-sectional area and return to its original design configuration and be propelled by hydraulic pressure.

PART 3 EXECUTION

3.01 PIPELINE CLEANING

A. The cleaning of the pipe line shall be done by the controlled and pressurized passage of a polyurethane pig of varying dimensions, coatings and densities as determined by the County through the piping system.

B. A series of pigs shall be entered into the system at a point as near to the beginning as is logistically and mechanically feasible.

C. A launching assembly shall be used as the entrance point for the pig. This assembly shall allow for the following:

1. The entering of pigs into the system by providing the means to induce flow from an external source, independent of the flows and pressures immediately available from the system, on the back of the pig to develop sufficient pressure to force the pig through the system.
2. A means to control and regulate the flow.
3. A means to monitor the flows and pressures.
4. A means to connect and disconnect from the system without any disruption to the operation of the system.

D. The pig shall be removed or discharged from the system at a point as near to the end as is logistically and mechanically feasible.

E. The contractor shall be responsible for the retrieval of the pig at the discharge point. This may include setting a trap that will not disrupt normal flow and operations but will capture the pig and any debris. A retrieval assembly may also be used but said assembly shall be able to connect and disconnect from the system without any disruption to the operation of the system.

F. Alternative launching and retrieval methods shall be done with the prior approval of the County.

G. Any pig that cannot progress through the piping system shall be located by the contractor and removed by excavation of the pipe in order to remove the blockage. All pipe repairs shall be the responsibility of the contractor and shall be performed with as little disruption to the system as possible.

H. Any increase in pressure that cannot be accounted for, i.e. fittings or valves or additional cleaning runs, shall be investigated, per the Engineers' approval, by locating the pig at the beginning of the increased pressure and excavating to determine the cause of the pressure increase. All pipe repairs shall be the responsibility of the contractor and shall be performed with as little disruption to the system as possible.

I. Final flushing of the cleansed lines shall be performed after the last successful run of the pig as determined by the County. The contractor shall be responsible for all applicable flushing and disinfection requirements for potable water lines.

3.02 ACCEPTANCE

A. The contractor shall maintain and provide a report at the end of the cleaning procedure containing the following:

1. The pressures in the pipe during the pigging procedure.
2. Any inline problems encountered during the procedure including all excavations with detailed locations, reason for the excavation and any corrective measures taken to the pipeline.
3. A record of the pigs used, their sizes, styles and other pertinent information regarding what materials were used during the cleaning.

4. An analysis of the condition of the pipeline before and after the cleaning procedure.

END OF SECTION

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SECTION 02619
HORIZONTAL DIRECTIONAL DRILLING

PART 1 GENERAL

1.01 SCOPE

The Contractor shall furnish all labor, materials, equipment and incidentals required to install all pipe, fittings and appurtenances as shown on the Drawings and specified in the Contract Documents by Horizontal Directional Drilling (HDD).

1.02 GENERAL

A. All existing structures, water and sewer lines, storm drains, utilities, driveways, sidewalks, signs, mail boxes, fences, trees, landscaping, and any other improvement or facility in the construction area that the Contractor disturbs for his own construction purposes shall be replaced to original condition at no additional cost to the County.

B. For “Navigable Waters of the U.S.” reference 33 of the Code of Federal Regulations, Part 329.

C. For “Waters of the U.S.” reference 33 of the Code of Federal Regulations, Part 323.

D. For “Waters of the State” reference Section 62-301 of the Florida Administrative Code.

1.03 TESTING

A. In place soil compaction tests shall be performed by a qualified testing laboratory.

B. Compaction tests shall be taken at every excavation, except in the road crossings or road shoulders; tests are to be taken according to current FDOT Standards.

C. All pipe shall be tested in accordance with the appropriate material specifications.

D. Reference Standards: American Society for Testing and Materials (ASTM), D1557, Moisture-Density Relations of Soils Using 10-lb. Rammer and 18-in. Drop.

E. The density of soil in place shall be a minimum of 95 percent in accordance with ASTM test 1557-70T, Method A or C.

1.04 QUALIFICATIONS

A. Pipe Manufacture: All pipe and fittings shall be furnished by a single manufacturer who is fully experienced, reputable and qualified in the manufacture of the items to be furnished.

B. Drilling Supervisor: The Contractor shall provide a competent boring specialist who shall remain on the project site during the entirety of the directional boring operation. This includes, but is not limited to, drilling fluid preparation, seaming, boring and pulling. The boring specialist shall have a minimum of five years of experience in supervising directional bores of similar nature, diameter, materials and lengths.

C. Pipe Fusion: All boring and fusing equipment shall be certified for operation. The Contractor responsible for thermal butt fusing pipe and fittings shall have manufacturer certification for performing such work or a minimum of five years of experience performing this type of work. If no certification is available, written documentation of the required work experience shall be submitted for approval.

D. Drilling Fluid Specialist: The personnel responsible for supervising the supply, mixing, monitoring fluid quality, pumping and re-circulation system proposed for the drilling fluid shall have a written certification issued by the Drilling Fluid manufacturer for performing such work or a minimum of five years of experience performing this type of work. If no certification is available, written documentation of the required work experience for the proposed personnel shall be submitted for review and approval.

1.05 SUBMITTALS

A. Detailed description including specifications and catalog cuts for:

1. Shop drawings and catalog data for all HDD equipment.
2. The pipe manufacturer's maximum degree of radial bending allowed for the pipe when full and when empty and pullback force recommended setting.
3. Steering and tracking devices including specific tracer wire.
4. Drilling fluids; the drilling fluid submittal shall include the ratio of mixture to water, including any additives, based on the Contractor’s field observations prior to construction, knowledge and experience with drilling in similar conditions, and any soil data provided in the Contract Documents, which shall be verified by the fluid specialist.
5. Shop drawings for the breakaway swivel, including the method of setting the swivels’ break point and set point to be used.
6. Shop drawings for sizing of the mandrel for pull through testing
7. Pipe assembly procedure, details of support devices, and staging area layout including methods to avoid interference with local streets, driveways, and sidewalks.
8. Details of pipe fusion procedures and copies of the fusion technician qualification certification or documentation.
9. Drilling fluid technician qualification certification or documentation

B. If the Contractor proposes any changes to the pull-back distance or profile shown on the drawings, he may be required to submit a complete design for the proposed pipe including an analysis for pull-back forces, external loads including full hydrostatic pressure if empty, external forces due to borehole collapse, ovalization during pull-back, thermal stress while exposed to Sun-light, shortening after release of pull-back force, and tensile stress during pull-back.

C. Bore Plan: For all contiguous piping installations over 300 feet in length or any installations for piping larger than 4" in diameter, the Contractor shall submit a Bore Plan that includes the following:

1. Contact information and experience for the drilling fluid specialist.
2. The number of passes the bore will include to get the product pipe installed.
3. The pilot bore and all reaming bore sizes including the final pullback with the product pipe.
4. Drilling rod length in feet.
5. The pilot bore, pre-ream bores (if any) and pullback production rate in minutes per (drilling) rod to maintain adequate mud flow.
6. Details of the entry and exit pit locations along with entry and exit angles for the bore, drawn to scale, depicting the position of all required equipment, access points, existing facilities to remain in place, existing traffic lanes to be maintained in operation, office trailers and storage sites.
7. The method of fusing or joining pipe of adjacent bores to ensure that the joint is on grade with the installed pipe.

D. Furnish a Bore Path Report to the County within seven days of the completion of each bore path. Data collected by the County Representative does not relieve the Contractor from the responsibility of recording his own data. Include the following in the report:

1. Location of project, project name and number
2. Name of person collecting data, including title, position and company name
3. Investigation site location (Contract plans station number or reference to a permanent structure within the project right-of-way)
4. Driller's Log & identification of the detection method used
5. Elevations and offset dimensions of installed pipe as referenced to the drawings
6. Data log of pullback force during product pipe installation
7. All failed bores. Include length of pipe left in place and explanation of failed installation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Incidental materials that may or may not be used to install the product depending on field requirements are not paid for separately and will be included in the cost of the installed product.

B. Drilling Fluids shall use a mixture of bentonite clay or other approved stabilizing agent mixed with potable water with a pH of 8.5 to 10.0 to create the drilling fluid for lubrication and soil stabilization. Vary the fluid viscosity to best fit the soil conditions encountered. Contractor shall have appropriate additives for drilling fluid available for different soil conditions that may be encountered. Do not use any other chemicals or polymer surfactants in the drilling fluid without written consent from the County. Certify to the County in writing that any chemicals to be added are environmentally safe and not harmful or corrosive to the product pipe.

C. For drilling operations that will be below waters of the State of Florida, only bentonite free drilling fluids shall be used. Acceptable products are BioMax, manufactured by M-I Swaco, Inc., P.O. Box 2216, Laurel, Mississippi 39440, Phone: (800) 731-7331 or Bio-Bore, manufactured by Baroid Drilling Fluids, Inc., P.O. Box 1675, Houston, Texas 77251, Phone: (731) 987-5900 or approved equal.

D. Identify the source of water for mixing the drilling fluid. Approvals and permits are required for obtaining water from such sources as streams, rivers, ponds or fire hydrants. Any water source used other than potable water may require a pH test.

E. The tracer wire to be used for all directional drills shall be a solid, 10 gauge, high strength, copper clad steel wire with a polyethylene jacket of appropriate color manufactured by Copperhead Industries or Manatee County approved equal.

F. Breakaway connectors shall be supplied by DCD Design & Manufacturing, Condux International, Inc. or approved equal.

PART 3 EXECUTION

3.01 SITE CONDITIONS

A. Carry out excavation for entry, exit, recovery pits, slurry sump pits, or any other excavation as specified in the Contract documents. Sump pits are required to contain drilling fluids if vacuum devices are not operated throughout the drilling operation, unless approved by the County.

B. Within 48 hours of completing installation of the boring product, clean the work site of all excess slurry or spoils. Take responsibility for the removal and final disposition of excess slurry or spoils. Ensure that the work site is restored to pre-construction conditions or as identified on the plans.

C. Exposure of product pipe to sunlight shall be limited to 14 consecutive days unless approved by the County.

D. The pipe shall be supported at intervals along its length with rollers or Teflon pads to minimize frictional forces when being pulled, and to hold the pipe above the ground. Surface cuts or scratches greater than or equal to the maximum defect depth in 3.08 E are not acceptable.

3.02 DAMAGE RESTORATION & REMEDIATION

A. The Contractor shall take responsibility for restoration for any damage caused by heaving, settlement, separation of pavement, escaping drilling fluid (frac-out), or the directional drilling operation, at no cost to the County.

B. When required by the County, provide detailed plans which show how damage to any roadway facility will be remedied. These details will become part of the Record Drawings Package. Remediation Plans must follow the same guidelines for development and presentation of the Record Drawings. When remediation plans are required, they must be approved by the County before any work proceeds.

C. For HDD operations that will be below waters of the State of Florida, the contractor shall be responsible for any damage caused by the drilling operation, including, but not limited to, fracturing of the channel bottom. Any State or Federal required environmental cleanup due to the release of drilling fluids into State waters shall be at the Contractor's expense. The Contractor may at his own expense increase the depth of his drilling operations upon the approval from the County.

3.03 QUALIFICATIONS FOR REJECTION OF DIRECTIONAL BORE

A. The County may reject any portion of the work that is deemed to be non-responsive to the Contract requirements or not in conformance with approved plans and submittals, and for other factors including the following:

1. Failed Bore: When there is any indication that the installed product has sustained damage, stop all work, notify the County and investigate damage. The County may require a pressure and / or mandrel test at no additional cost to the County and shall have a County representative present during the test. Perform all testing within 24 hours unless otherwise approved by the County. Furnish a copy of the test results and all bore logs to the County for review and approval. The County is allowed up to 5 working days to approve or determine if the product installation is not in compliance with the specifications.
2. Obstructions: If an obstruction is encountered during boring which prevents completion of the installation in accordance with the design location and specification, the pipe may be taken out of service and left in place at the discretion of the County.
3. Pull-back Failure: If the installed breakaway device should fail during pull back.
4. Loss of Drilling Fluids: If the drilling fluid is “lost” during the pull back of the product and cannot be regained within the required timeframe of the manufacturer or if more than a reasonable amount of fluid is used to fill an unknown void and flow cannot be regained. No pipe shall be pulled without visible flow of drilling fluid.
5. Test Failure: If the pipe shall fail a hydraulic pressure test or mandrel test as specified by the County.
6. Damaged Pipe: If at any time when the product is pulled back and any exposed areas have a greater than allowable “gouging” or visible marring of the pipe per the table in 3.08 E.
7. Alignment Tolerance Exceeded: If the vertical and horizontal limits are not within tolerances.
8. Defective Material: Any other defect in material or workmanship which would affect the quality, performance, or installation life of the installed pipeline.

B. Remediation: All rejected bores shall be at the Contractors expense to correct and provide a satisfactory installed product. The Contractor shall submit to the County a revised installation plan and procedure for approval before resuming work. The County may require non-compliant installations to be filled with excavatable flowable fill or to be completely removed at no additional cost to the County.

3.04 PRODUCT LOCATING AND TRACKING

A. The County recognizes walkover, wire line, and wire line with surface grid verification, or any other system as approved by the County, as the accepted methods of tracking directional bores. Use a locating and tracking system capable of ensuring that the proposed installation is installed as intended. The locating and tracking system must provide information on:

1. Clock and pitch information
2. Depth
3. Transmitter temperature
4. Battery status
5. Position (x,y)
6. Azimuth, where direct overhead readings (walkover) are not possible (i.e. sub aqueous)

B. Ensure proper calibration of all equipment before commencing directional drilling operation.

C. Prepare the Driller's Log. Take and record alignment readings or plot points such that elevations on top of and offset dimensions from the center of the product to a permanent fixed feature are provided. Such permanent fixed feature must have prior approval of the County. Provide elevations and dimensions at all bore alignment corrections (vertical and horizontal) with a minimum distance between points of 10 feet. Provide a sufficient number of elevations and offset distances to accurately plot the vertical and horizontal alignment of the installed product.

D. Installation Location Tolerances: The pilot hole shall be drilled on a bore path with no deviations greater than ten (10) percent of depth of cover over the length of the bore. If the pilot bore does deviate from the bore path by more than ten (10) percent of depth of cover, the Contractor shall notify the Owner/Engineer prior to pull back. The Owner/Engineer may require the Contractor to pull back and re-drill the pilot bore to correct any deviations. The alignment deviations shall not exceed two (2) feet throughout the length of the bore.

It shall be the Contractors responsibility to notify the Owner/Engineer when the pilot bore activities are taking place. The Contractor shall provide the Owner/Engineer a printout of the pilot bore plan for review prior to pull back.

3.05 PRODUCT BORE HOLE DIAMETER

Minimize potential damage from soil displacement/settlement by limiting the ratio of the bore hole to the product size. The size of the back-reamer bit or pilot bit, if no back reaming is required, will be limited relative to the product diameter to be installed as follows:

Table 2-1. Recommended Relationship between Product Diameter and Reamed Diameter

Product Diameter	Reamed Diameter
< 8”	Diameter of product + 4”
8” – 24”	Diameter of product x 1.5
> 24”	Diameter of product + 12”
*Horizontal Directional Drilling Good Practices Guidelines – HDD Consortium	

3.06 EQUIPMENT REQUIREMENTS

A. The HDD equipment selected by the Contractor shall be capable of drilling, steering, tracking, reaming and installing the pipeline through all the subsurface conditions that may be present at the site.

B. Match equipment to the size of pipe being installed. Obtain the County’s approval for installations differing from the above chart. Ensure that the drill rod can meet the bend radius required for the proposed installation.

C. All HDD equipment shall have an electronic data logger to record pull back force during all pipe installations.

D. All HDD equipment that has the capability to exceed the maximum recommended pulling force shall have a breakaway swivel properly attached to the product pipe that will release if the pullback force exceeds the pipe manufacturers recommended pulling force.

3.07 THRUST / PULLBACK REQUIREMENTS

The Contractor shall provide as part of the required working drawings submittal complete data regarding the operational and maximum thrust or pulling forces to be used for the initial drill head and back-reamer installations, and the final pull-back of the pipe. Gages or other measurement tools shall be used to monitor the forces being used.

3.08 INSTALLATION PROCESS

A. Ensure adequate removal of soil cuttings and stability of the bore hole by monitoring the drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming and pipe installation. Relief holes can be used as necessary to relieve excess pressure down hole. Obtain the County’s approval of the location and all conditions necessary to construct relief holes to ensure the proper disposition of drilling fluids is maintained and unnecessary inconvenience is minimized to other facility users.

B. The Contractor shall determine the pull-back rate in order to allow the removal of soil cuttings without building excess down-hole pressure and to avoid local heaving, or spills. Contain excess drilling fluids at entry and exit points until they are recycled and separated from excavated materials, or removed from the site or vacuumed during drilling operations. Ensure that entry and exit pits and storage tanks are of sufficient size to contain the expected return of drilling fluids and soil cuttings. The bored hole shall always be maintained full of drilling fluids for support of surfaces, and the fluid re-circulation equipment shall operate continuously until the pipe installation is completed and accepted by the County.

C. Ensure that all drilling fluids are disposed of or recycled in a manner acceptable to the appropriate local, state, or federal regulatory agencies. When drilling in suspected contaminated ground, test the drilling fluid for contamination and appropriately dispose of it. Remove any excess material upon completion of the bore. If in the drilling process it becomes evident that the soil is contaminated, contact the County immediately. Do not continue drilling without the County's approval.

D. The timing of all boring processes is critical. Install a product into a bore hole within the same day that the pre-bore is completed to ensure necessary support exists. Once pullback operations have commenced, the operation shall continue without interruption until the pipe is completely pulled into the borehole.

E. All prepared pipe that is being used for installation shall be adequately supported off the ground along the entire length to avoid damaging of the material during pullback due to ground surface conditions. Surface cuts or scratches greater than or equal to the maximum defect depth are not acceptable.

Pipe Size In.	Max. Defect Depth In.
4	1/16
6	1/11
8	5/32
10	3/16
12	1/4
> 12	Per Pipe Manufacturer's Recommendations

F. The drilling fluid specialist shall remain on the project site during the entirety of the directional boring operation to ensure proper mixture and production of drilling fluids needed for the bore.

G. Upon successful completion of the pilot hole, the borehole shall be reamed to a minimum of 25 percent greater than the outside diameter of the pipe being installed.

H. For bores with more than two radii of curvature (entrance and exit), the borehole should be reamed up to 50 percent larger than the outside diameter of the carrier pipe. Prereaming may be necessary dependent on size of material to be pulled.

I. Additional passes for prereaming may be required for larger pipe. Incremental increases shall be used as needed until appropriate bore hole size has been achieved.

J. Prereaming must be accomplished with no product attached to the reamer head on all bore pipe 6” and larger. The bore product maybe pulled back on final pass of prereaming upon prior approval from the County.

K. After reaming the borehole to the required diameter, the pipe shall be pulled through the hole. In front of the pipe shall be a breakaway swivel and barrel reamer to compact the borehole walls.

L. The Contractor shall not attempt to ream at a rate greater than the drilling equipment and drilling fluid system are designed to safely handle.

M. Install all piping such that their location can be readily determined by electronic designation (tracer wire) after installation.

1. For non-conductive installations, externally attach two (2) tracer wires; see Section 2.01 – Materials, Part I. above, to the top of product pipe and secure in place with duct tape or 10-mil thickness polyethylene pressure sensitive tape at every joint and at 5 foot intervals.

N. Connect any break in the conductor line before construction with an electrical clamp, or solder, and coat the connection with a rubber or plastic insulator to maintain the integrity of the connection from corrosion. Clamp connections must be made of brass or copper and of the butt end type with wires secured by compression. Soldered connections must be made by tight spiral winding of each wire around the other with a finished length minimum of 3 inches overlap. Tracking conductors must extend 2 feet beyond bore termini. Test conductors for continuity. Each conductor that passes must be identified as such by removing the last 6 inches of the sheath. No deductions are allowed for failed tracking conductors. Upon completion of the directional bore, the Contractor shall demonstrate to the County that the wire is continuous and unbroken through the entire run of the pipe by providing full signal conductivity (including splices) when energizing for the entire run in the presence of the County Representative. If the wire is broken, the Contractor shall repair or replace it at no additional cost to the County.

3.09 PIPELINE TESTING

A. HYDROSTATIC TESTING

1. Refer to Manatee County Public Works Utility Standards Part 1-Utility Standards Manual Section 1.8.7.

B. MANDREL DEFLECTION TESTING PROCESS

1. The deflection test for flexible pipe systems shall be performed by pulling a mandrel through the pipe line. The mandrel shall have a diameter equal to 80 percent of the inside diameter of the pipe system being tested. When the mandrel cannot be pulled through the pipe line the Contractor shall locate and correct the defect to the satisfaction of the County. After the defect is corrected and trench backfilled, the section of line shall then be retested to compliance.

2. Deflection tests shall be performed not sooner than 30 days after completion of placement and densification of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

3. The mandrel types that can be used are:
   a. a rigid, nonadjustable, odd number of legs (9 legs minimum), mandrel having an effective length not less than its nominal diameter; and (2) be fabricated of steel, fitted with pulling rings at each end, stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size and be furnished in a suitable carrying case labeled with the same data as stamped or engraved on the mandrel.

   b. If approved by the County, a smaller diameter piece of similar pipe material that is approximately 3 feet long and meets the 80% reduction of the inside diameter of the pipe being tested.

4. The mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded or that “necking” has not occurred. Prior to use, the mandrel shall be inspected by County personnel. Use of an unapproved mandrel or a mandrel altered or modified after inspection will invalidate the test. If the mandrel fails to pass, the pipe will be deemed overdeflected or necked.

5. Overdeflected or necked pipe shall be abandoned and reinstalled. The replaced pipe shall be tested for deflection not sooner than 30 days after installation.

D. The following deficiencies in the flexible pipe system installation shall be corrected by the Contractor at no cost to the County:

1. Overdeflections
2. Stretched or “Necked” Pipe
3. Damaged Pipe
4. Improper Pipe Welds
5. Infiltration Points
6. Debris in the line

E. The County will not accept a credit, maintenance bond, or any other form of compensation in lieu of corrective measures that may be required to correct any sections of flexible pipe system that are improperly installed or do not meet the requirements of these specifications. In addition, all corrective measures proposed by the Contractor shall be approved by the County. In addition, should repairs of the flexible pipe system be accomplished by the use of any unauthorized materials or procedure, the County will require replacement of those substandard portions or repairs made to conform to the requirements of these specifications.

END OF SECTION

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SECTION 02619B
CLOSE TOLERANCE HORIZONTAL DIRECTIONAL DRILLING

PART 1 GENERAL REQUIREMENTS AND CONTRACTOR QUALIFICATIONS

1.01 SCOPE

The Contractor shall furnish all labor, materials, equipment and incidentals required to install all pipe, fittings and appurtenances as shown on the Drawings and specified in the Contract Documents by Horizontal Directional Drilling (HDD

This section covers close tolerance horizontal directional drilled pipelines. Close tolerance HDD (CTHDD) or (ArrowBore™) is used in gravity flow installations and shallow depth pressure main installations. The pipe shall be installed in a manner that causes minimal disruption to the surface topography (no pressure humping of drives, yards and streets).

The contractor shall will need to be trained and licensed to provide CTHDD trenchless services within the industry. The contractor's crew leader shall have completed a minimum of 3 similar installations. Similar installations shall consist of critical line, grade and tight fitted hole bores for gravity flow and pressure main applications in an urbanized area with geological conditions similar to those at the site. River crossing installations and cable or phone duct installations are not considered similar installations due to the significantly different HDD techniques that are involved.

1.02 GENERAL

All existing structures, water and sewer lines, storm drains, utilities, driveways, sidewalks, signs, mail boxes, fences, trees, landscaping, and any other improvement or facility in the construction area that the Contractor disturbs for his own construction purposes shall be replaced to original condition at no additional cost to the County.

1.03 QUALIFICATIONS

Pipe Manufacture: All pipe and fittings shall be furnished by a single manufacturer who is fully experienced, reputable and qualified in the manufacture of the items to be furnished.

The contractor shall submit, to the Owner/Engineer, the names of the directional boring machine operator and directional boring machine navigational equipment operator. Both of these individuals shall have a minimum or three years each of directional boring experience and a minimum of one-year each in critical line and grade installations. If neither have such experience, then they need to show proof of formal training by an experience industry professional.

The Contractor shall submit, to the Owner/Engineer, in writing, the planned procedure for performing the bore within the allowable tolerances as listed in section, TESTING AND INSPECTION FOR ACCEPTANCE OF THE MAINLINE, of these specifications. The procedure shall, at a minimum, include the following:

Verification method for pilot bore location. The contractor shall, to the satisfaction of the Owner/Engineer, provide a means for accurately verifying the location of the pilot bore at certain points throughout the bore. Verification must be by visible detection or physical measurement along with the use of existing electronic detection. Electronic detection alone will not be allowed.

Recommended Vertical Sight Relief Hole Spacing

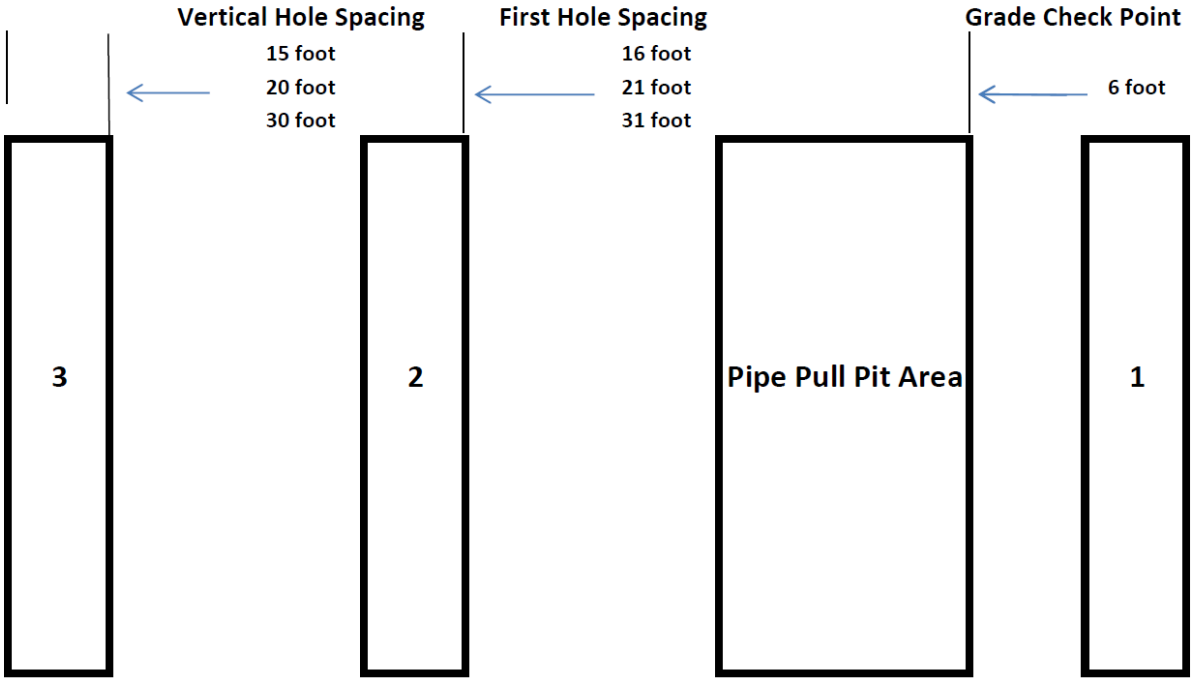
For Gravity Sewer Installations.

Soil conditions and the % of grade will determine the spacing.

For grades above .50% spacing can vary based on the operators experience.

Spacing should never exceed 40 foot (only in special situations).

Feet Spacing	Percent Grade		Feet Spacing	Percent Grade	
30	0.40%	Heavy Clay	30	0.40%	Sand/no Water Table
30	0.30%	Heavy Clay	20	0.30%	Sand/no Water Table
20	0.15%	Heavy Clay	15	0.20%	Sand/Water Table
20	0.30%	River Bottom Silt	15	0.15%	Sand/Water Table
20	0.20%	River Bottom Silt	15	0.15%	Sand/Water Table



Pilot bore stem placement and stability. To the satisfaction of the Owner/Engineer, the contractor must use CTHDD approved tooling that will provide a method to control the pilot bore stem in the correct alignment prior to back reaming.

If the Contractor does not meet the experience requirements set forth in the first two paragraphs of this section, the contractor must satisfy the following:

The contractor must, to the satisfaction of the City, show that he has been trained to provide CTHDD technology within the industry and has completed the educational program that provides the contractor a reasonably high probability of successfully completing the bore.

PART 2 PRODUCTS

2.01 MATERIALS

A. Technical Specifications, solely for the purposes of assisting the contractor in preparing its bid. By making this report available to the contractor, the Owner/Engineer makes no representations that the report is a true and accurate representation of the existing conditions. The contractor shall continue to be responsible to make all normal and customary examinations of the contract documents and site conditions.

B. No individual bore shall exceed the total distance between any two manholes, fire hydrants or mainline valves and tees unless approved by the Owner/Engineer prior to start of the installation.

C. Depths and grades shall be as shown on the plans for gravity flow installation. Adjustments can be made for pressure mains as needed based on existing utility locations and approval by the design engineer. Pressure mainlines shall be installed at a serviceable depth.

D. For the equipment proposed to be used, the contractor shall supply, to the Owner/Engineer, the manufacturer's specifications for the directional boring equipment. This submittal shall detail thrust and pullback. Additionally, the contractor shall supply, to the Owner/Engineer, the manufacturer's specifications for the navigational equipment that details the precisions of beacon and maximum line and grade deviations. Contractor will only use CTHDD approved tooling based on the soil conditions.

E. The exact CTHDD procedure for completing the bore shall be the responsibility of the contractor. However, in order to prevent pipe deflection in the bored hole, the following requirements must be met:

i. The maximum annular space around the greater diameter of the pipe shall be no greater than ¼" to ½", i.e., for a 14" O.D. PVC pipe the back reamer shall be no larger than 14 1/2" inches. Multiple back reams will not be allowed.

ii. The contractor shall not leave any unfilled reamed bore holes. All reamed bore holes that are not used for pipe placement shall be grouted with a mixture that meets the Owner/Engineer's approval. In general, this applies to bore holes that are created by pulling the pipe from the ground surface rather than from an excavated pit, but may apply elsewhere. The displaced volume for pilot bore stems alone is not of sufficient volume to require grouting, i.e., pilot bore from machine to grade position than is not reamed.

iii. Any vertical sight relief holes used to visibly verify the location of the pilot bore stem shall be filled with an earthen material unless they are located in areas that receive traffic bearing loads in which case they shall be filled with an engineer approved backfill like, "flowable fill" (CLSM).

2.02 MEASUREMENT AND PAYMENT

Open excavation projects using Close Tolerance Horizontal Directional Drilling will be paid based on the agreed units that would be normally paid if open excavation was used.

If the utility owner call out in the bid items Close Tolerance Horizontal Directional Drilling the unit price shown will be paid without additional payments for restoration units. Unless noted other wise.

PART 3 EXECUTION

3.01 TESTING AND INSPECTION FOR ACCEPTANCE OF SANITARY SEWERS

Refer to Section 02623 for gravity sewer testing requirements.

Refer to Section 02619 for pressure pipe testing requirements.

3.02 DRILLING FLUID DISPOSAL

The Contractor is responsible for drilling fluid disposal and all other restoration. Contractor must comply with all regulations regarding the proper disposal of drilling fluid. Cleaning, flushing, and hydrostatic testing of the pipe shall be conducted as specified elsewhere in our standards.

SECTION 02620

POLYETHYLENE (PE) PRESSURE PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment and incidentals required to install polyethylene pressure pipe, fittings and appurtenances as shown on the Drawings and specified in the Contract Documents and these Standards.

B. Newly installed pipe shall be kept clean and free of all foreign matter & gouges.

C. All pipe shall be correctly color coded / identified.

1.02 QUALIFICATIONS

All polyethylene pipe, fittings and appurtenances shall be furnished by a single manufacturer who is fully experienced, reputable and qualified in the manufacture of the items to be furnished.

1.03 SUBMITTALS

A. The Contractor shall submit to the County, within ten days after receipt of Notice to Proceed, a list of materials to be furnished, the names of the suppliers and the appropriate shop drawings for all polyethylene pipe and fittings.

B. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable sections of the Specifications.

C. The Contractor shall submit shop drawings showing installation method and the proposed method and specialized equipment to be used.

PART 2 PRODUCTS

2.01 POLYETHYLENE PRESSURE PIPE

A. Polyethylene pipe 4" diameter and larger shall be high-density bimodal PE3408/PE 100/PE4710 polyethylene resin with a minimum cell classification of 445574 per ASTM D3350, Class 200, DR 11, Performance Pipe DriscoPlex 4000, or an approved equal, meeting the requirements of AWWA C906. All pipe materials used in potable water systems shall comply with NSF Standard 61. Outside diameters of water, reclaimed water and pressure sewer HDPE pipes shall be ductile-iron sizing system (DIPS).

B. Polyethylene tubing 2 inches in diameter and smaller for potable water and reclaimed water shall be high density PE 3408 polyethylene resin per ASTM D2737, Pressure Class 200, Copper Tube Size (CTS), SDR 9, Performance Pipe DriscoPlex 5100, Endot EndoPure, Charter Plastics or an approved equal, meeting the requirements of AWWA C901. Butt fusion or CTS brass connections shall be used. All pipe materials used in potable water systems shall comply with NSF Standard 61.

C. Polyethylene pipe 3 inches in diameter (for potable water and reclaimed water), and 3 inches in diameter and smaller (for wastewater force mains) shall be high-density PE 3408 polyethylene, per ASTM D2737, Pressure Class 160, iron pipe size (IPS) outside diameter, DR 11, Performance Pipe DriscoPlex 4100 or an approved equal, meeting the requirements of ASTM D 3035 and AWWA C901.

2.02 JOINTS

A. Where PE pipe is joined to PE pipe, it shall be by thermal butt fusion. Thermal fusion shall be accomplished in accordance with the written instructions of the pipe manufacturer and fusion equipment supplier. The installer of the thermal butt fused PE pipe shall have received training in heat fusion pipe joining methods and shall have had experience in performing this type of work.

B. Where thermal butt fusion cannot be used, or when specifically called for on the plans, electro-fused couplings may be used. Fusion shall be in accordance with the written instructions of the fitting manufacturer.

C. Flanged joints, mechanical joints, tapping saddles, and molded fittings shall be in accordance with AWWA C901, C906 or C909, ASTM D3350 and D3140, as applicable. Fusion and mechanical connections are allowed, chemical (solvents, epoxies, etc.) are not allowed.

2.03 DETECTION

A. Direct buried HDPE pipe shall have 3" detectable metallic tape of the proper color placed directly above the pipe and 12" below finished grade or 6" detectable tape between 12" and 24" below finished grade.

B. Direct buried or horizontal directional drilled HDPE pipe shall also have tracer wire installed along the pipe alignment. The tracer wire to be used shall be a solid, 10 gauge, high strength, copper clad steel wire with a polyethylene jacket of appropriate color manufactured by Copperhead Industries or Manatee County approved equal.

2.04 IDENTIFICATION

A. Pipe shall bear identification markings in accordance with AWWA C906.

B. Pipe shall be color coded blue for water, purple (Pantone 522 C) for reclaimed water or green for pressure sewer using a solid pipe color or embedded colored stripes. Where stripes are used, there shall be a minimum of three stripes equally spaced.

PART 3 EXECUTION

3.01 INSTALLING POLYETHYLENE PRESSURE PIPE AND FITTINGS

All polyethylene pressure pipe shall be installed by direct bury, directional bore, or a method approved by the County prior to construction. If directional bore is used, or if directed by the County, the entire area of construction shall be surrounded by silt barriers during construction.

3.02 INSPECTION AND TESTING

All pipelines shall remain undisturbed for 24 hours to develop complete strength at all joints. All pipelines shall be subjected to a hydrostatic pressure and leak test per section 02617.

END OF SECTION

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SECTION 02622

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS (AWWA SPECIFICATIONS C-900 & C-905)

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals required to install the plastic piping, fittings and appurtenances complete and ready for use as specified in the Contract Documents and these Standards.

1.02 DESCRIPTION OF SYSTEM

The Contractor shall install the piping in the locations as shown on the Drawings.

1.03 QUALIFICATIONS

All plastic pipe, fittings and appurtenances shall be furnished by a single manufacturer who is fully experienced, reputable, qualified and specializes in the manufacture of the items to be furnished. The pipe and fittings shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications.

1.04 SUBMITTALS

A. The Contractor shall submit shop drawings to the County including, but not limited to, dimensions and technical specifications for all piping.

B. The Contractor shall submit to the County, samples of all materials specified herein.

C. The Contractor shall submit and shall comply with pipe manufacturer's recommendation for handling, storing and installing pipe and fittings.

D. The Contractor shall submit pipe manufacturer's certification of compliance with these Specifications.

1.05 TOOLS

The Contractor shall supply special tools, solvents, lubricants, and caulking compounds required for proper installation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pressure Class-Rated Polyvinyl Chloride (PVC) Pipe

1. Pressure class-rated PVC pipe and accessories four to twelve inches (4"-12") in diameter, shall meet the requirements of AWWA Specification C-900 "Polyvinyl Chloride (PVC) Pressure Pipe". Pipe shall be Class 250, meeting requirements of Dimension Ratio (DR) 18 and shall have the dimension of ductile iron outside diameters. Each length of pipe shall be hydrostatically tested to four (4) times its class pressure by the manufacturer in accordance with AWWA C-900.

2. Fourteen inch (14") thru thirty-six (36") PVC pipe for sewer force mains shall meet AWWA C-905 requirements for dimension ratio (DR) 18. Each length of pipe shall be tested at twice the pressure rating (PR 235 psi) for a minimum dwell of five seconds in accordance with AWWA C-905.

   PVC pipe shall not be used for potable and reclaim waterlines 16 inches and larger.

   Pipe shall be listed by Underwriters Laboratories. Provisions shall be made for expansion and contraction at each joint with an elastomeric ring, and shall have an integral thickened bell as part of each joint. PVC Class pipe shall be installed as recommended by the manufacturer. Pipe shall be furnished in nominal lengths of approximately 20 feet, unless otherwise directed by the County. Pipe and accessories shall bear the NSF mark indicating pipe size, manufacturer's names, AWWA and/or ASTM Specification number, working pressure, and production code.

3. Rubber gaskets shall conform to AWWA C111 for mechanical and push-on type joints and shall be EPDM (Ethylene-Propylene Diene Monomer) rubber for potable water and reclaimed water pipelines. Standard gaskets shall be such as Fastite as manufactured by American Cast Iron Pipe Company, or an approved equal.

4. PVC pipe 3" and less in diameter may be constructed using pipe conforming to ASTM D2241 with push-on joints. Pipe shall be 200 psi pipe-SDR 21 unless otherwise specified by the County. This PVC pipe shall not be used for working pressures greater than 125 psi.

5. Pipe shall be <u>blue</u> for potable water mains, <u>green</u> for sewage force mains and <u>purple</u> for reclaimed water mains. All potable water pipe shall be NSF certified and copies of lab certification shall be submitted to the County.

6. Where colored pipe is unavailable, white PVC color coded spiral wrapped pipe shall be installed.

B. Joints

1. The PVC joints for pipe shall be of the push-on type unless otherwise directed by the County so that the pipe and fittings may be connected on the job without the use of solvent cement or any special equipment. The push-on joint shall be a single resilient gasket joint designed to be assembled by the positioning of a continuous, molded resilient ring gasket in an annular recess in the pipe or fitting socket and the forcing of the plain end of the entering pipe into the socket, thereby compressing the gasket radially to the pipe to form a positive seal. The gasket and annular recess shall be designed and shaped so that the gasket is locked in place against displacement as the joint is assembled.

   The resilient ring joint shall be designed for thermal expansion or contraction with a total temperature change of at least 75 degrees F in each joint per length of pipe. The bell shall consist of an integral wall section with a solid cross section elastomeric ring which shall meet requirements of ASTM F-477. The thickened bell section shall be designed to be at least as strong as the pipe wall. Lubricant furnished for lubricating joints shall be nontoxic, shall not support the growth of bacteria, shall have no deteriorating effects on the gasket or pipe material, and shall not impart color, taste, or odor to the water. Gaskets shall be suitable for use with potable water, reclaimed water or sanitary sewer as applicable.

2. Restrained joints shall be provided at all horizontal and vertical bends and fittings, at casings under roads and railroads and at other locations shown on the Contract Drawings. PVC joints for pipe shall be restrained by the following methods: thrust blocks, restraining glands such as Certa-Lok Restraining Joint Municipal Water Pipe by the Certain Teed Corporation of Valley Forge, PA, or approved equal. All Grip, Star Grip by Star Products, MJR by Tyler Pipe, Tyler, Texas. Restrained joint PVC pipe shall be installed in strict accordance with the manufacturer's recommendation.

C. Fittings

1. 1. All fittings for class-rated PVC pipe shall be ductile iron with mechanical joints and shall conform to the specifications for ductile iron fittings, unless otherwise directed. Class 200, C-900 PVC fittings are allowable for sewage force main applications up to and including 12" diameter only. DR ratio shall be the same as the pipe.

2. 2. The manufacturer of the pipe shall supply all polyvinyl chloride accessories as well as any adapters and/or specials required to perform the work as shown on the Drawings and specified herein. Standard double bell couplings will not be accepted where the pipe will slip completely through the coupling.

PART 3 EXECUTION

3.01 INSTALLATION

The Contractor shall install the plastic pipe in strict accordance with the manufacturer's technical data and printed instructions. Direct bury pipe shall have 3" detectable metallic tape of the proper color placed directly above the pipe 12" below finished grade or 6" detectable tape between 12" and 24" below grade.

3.02 INSPECTION AND TESTING

All pipe lines shall remain undisturbed for 24 hours to develop complete strength at all joints. All pipe lines shall be subjected to a hydrostatic pressure test for two (2) hours at full working pressure, but not less than 180 psi for water/reclaimed (150 psi for force main). All visible leaks shall be repaired and retested for approval by the County. Prior to testing, the pipe lines shall be supported in a manner approved by the County to prevent movement during tests.

END OF SECTION

SECTION 02627
SANITARY SEWER MANHOLE REHABILITATION

PART 1 GENERAL

1.01 DESCRIPTION

A. This specification consists of all work, materials, labor and equipment required for manhole rehabilitation for the purpose of eliminating infiltration and exfiltration, providing corrosion protection, adjusting final grade of manhole top, repair of voids and restoration of the structural integrity of the manhole. All such work shall comply with these Specifications and the specific product manufacture's recommendations. Any conflict between the product manufacture's recommendations and any portion of the Contract Documents shall be resolved prior to beginning the work.

1.02 PRODUCT AND MANUFACTURER QUALIFICATION REQUIREMENTS

A. Since sewer products are intended to have a 50-year design life, and in order to minimize the County's risk, only proven products with substantial successful long term track records will be allowed. At a minimum, products and installers must meet all of the following criteria to be deemed commercially acceptable:

1. For a Product to be considered commercially acceptable, the product must have a minimum of two (2) million square feet and ten (10) year history of successful wastewater collection system installations in the United States. In addition, products must provide Third Party Test Results supporting the long-term performance and structural strength of the product and such data shall be satisfactory to the Owner. No product will be allowed without Independent Third Party Testing verification.

2. For an installing Contractor to be considered commercially acceptable, the installer must have a certification from the manufacturer as a licensed and fully trained installer of the product. The installer must also have a minimum of one (1) million square feet of successful wastewater collection system installations on underground concrete/masonry structures and ten (10) years of rehabilitation experience.

1.03 SUBMITTALS:

A. Product
1. Technical data sheets showing the physical and chemical properties.
2. Material Safety Data Sheets (MSDS).
3. Third Party Testing results.
4. Verification of minimum installation requirements set forth in section 1.02.A.1 above.

B. Installer
   1. Verification of “certified applicator” status.
   2. Verification of minimum installation requirements set forth in section 1.02.A.2 above.

C. Written certification from the product manufacturer that each of the proposed rehabilitation products is compatible with each other.

D. Submit with Each Project:
   1. Description, layout, and application sequencing plan.
   2. Rehabilitation system application requirements including material handling and storage requirements, mixing and proportioning requirements (as applicable), maximum pot life, film/coating thickness, curing, testing and certification requirements of all rehabilitation materials. Product Material Safety Data Sheets.
   3. Detailed instructions and methodology for finishing all pipe and manhole connections to rehabilitated manholes to prevent infiltration and exfiltration.
   4. Wastewater Flow Control/Bypassing Plan.
   5. Confined Space Entry Plan/Permit.
   6. Plan for capturing extraneous debris during rehabilitation processes and debris disposal.

1.04 MATERIALS

A. Refer to the latest Manatee County Public Works Utility Standards Section 12 Precast Concrete Manholes and Wetwells for material requirements and details.

1.04.1 CEMENTITIOUS MORTOR

A. Mortar shall be made of one part Portland cement and two parts clean sharp sand. Cement shall be Type 1 and shall conform to ASTM C 150. Sand shall meet the requirements of ASTM C 144.

1.04.2 PATCHING MATERIAL

A. A quick setting fiber reinforced cementitious material shall be used as a patching material and is to be mixed and applied according to manufacturer’s recommendations.

1.04.3 HYDRAULIC CEMENT

A. A rapid setting, high-early-strength, cementitious product specifically formulated for leak control shall be used to stop water infiltration. The material shall be mixed and applied according to the manufacturer’s recommendations.

1.04.4 CHEMICAL GROUT

A. A chemical grout shall be used for stopping very active infiltration and filling voids.

1.04.5 LINER MATERIAL

A. CEMENTITIOUS MATERIAL

1. Cementitious liner products shall be used to form a structural monolithic liner covering all interior manhole surfaces and shall have the following minimum requirements:
   a. Compressive Strength (ASTM C109): 7,000 psi, 28days
   b. Tensile Strength (ASTM C496): 700 psi, 28 days
   c. Flexural Strength (ASTM C293): 1,300 psi, 28 days
   d. Shrinkage (ASTM C596): 0.02% at 28 days
   e. Minimum Bond (ASTM C952): 200 psi, 28 days

2. Refer to Section 09920 Sewpercoat Surface System of the specifications.

   When used as the final rehabilitation liner material (no epoxy liner), product shall be made with calcium aluminate cement. Calcium aluminate is not required when the cementitious liner is used as the underlayment for a protective coating liner application.

B. PROTECTIVE COATING LINER MATERIAL

1. The protective coating liner is to be applied where corrosion is anticipated. The protective coating liner material shall be applied over the completed cementitious liner material (without the calcium aluminate). The liner shall be spray applied or spin cast. The manufacturer of the selected protective coating liner material shall approve in writing that their protective coating liner is compatible with cementitious repair and liner material.

2. The protective coating liner material shall conform to Section 09970 Surface Protection Spray Systems of the specifications.

C. WATER

1. Water shall be clean and potable.

1.04.6 INTERNAL MANHOLE CHIMNEY SEAL MATERIAL

A. An aromatic urethane rubber material or flexible epoxy mastic used to prevent leakage of water into the manhole through the frame joint area and the area above the manhole cone and shall have the following minimum requirements:

1. Elongation (ASTM D412): 600%
2. Tensile Strength (ASTM D412): 1,150 psi
3. Adhesive Strength (ASTM D903): 175 lb. l/in.
4. Tear Resistance (ASTM D1004): 155 lb. l/in.

The seal shall extend from the inside of the manhole frame down to the cone or corbel of the manhole.

1.04.7 EXTERNAL MANHOLE SEAL WRAP

A. External Manhole Seal Wrap: When work consists of adjusting manholes or cone replacements, an external seal wrap shall be installed to the outside of concrete risers, steel risers and joints of the precast manhole in order to eliminate infiltration. The external seal wrap shall conform with Manatee County Public Works Department Utility Standards Section 12 and be installed in accordance with the details of the Contract Documents and the manufacturer's recommendations.

1.05 PREPARATION

A. Perform traffic control in accordance with the approved traffic control submittal.

B. Store materials in accordance with manufacturer's recommendations.

C. Schedule and perform the work in a manner that does not cause or contribute to overflows or spills of sewage from the sewer system.

D. Install devices to prevent extraneous material from entering the sewer system and to prevent upstream line from flooding the manhole. If extraneous material or debris falls into a "live" manhole during adjustment operations, the Contractor shall remove debris at no cost to the Owner.

E. Dispose of wastes in accordance with applicable regulations.

F. Schedule and perform any bypass pumping that will be necessary to properly rehabilitate the manhole.

G. If present in the manhole, Contractor shall remove all access steps. Removal shall consist of neatly cutting steps flush with the wall prior to any lining installation. Contractor shall be responsible for proper disposal of steps.

H. For manholes that are located within pavement areas and require resetting or replacement of concrete riser rings, cones, and /or frames, the Contractor shall sawcut, remove, and replace a 6 ft. x 6 ft. square or round section of pavement and base for rehabilitation operations. Costs for removal and replacement of pavement and base beyond these limits shall be borne by the Contractor.

1.06 INSTALLATION

A. Prior to any lining all other miscellaneous work must be complete.

B. Prior to man entry into any structure to be rehabilitated, proper ventilation and strict confined space OSHA regulations shall be followed. Failure to do so shall be grounds for removal from the project.

1.06.1 CONE REPLACEMENT

A. The Contractor shall replace existing deteriorated manhole cone section with new precast concrete cone section. A preformed rubber gasket shall be placed in all keyways between existing manhole riser section and cone joints. Prior to backfilling, rubber external seal wraps shall be applied to the cone and manhole section joint, riser rings and frame in accordance with Manatee County Public Works Department Utility Standards. If the existing manhole is of brick construction, the cone shall be set in a full bed of mortar on the top course of bricks.

1.06.2 RISER RINGS

A. The Contractor shall replace existing, deteriorated riser rings with new precast concrete riser rings. All manholes designated to receive casting adjustment and/or alignment shall be adjusted to meet existing finished grade unless an alternative elevation is specified. A cementitious mortar shall be placed in between individual precast concrete riser rings, and precast concrete riser ring and cone joints. The mortar shall be struck smooth with the interior surface of the manhole and floated with a sponge float to a surface profile of 8-10 mils. Prior to backfilling, rubber external seal wraps shall be applied to the cone and manhole section joint, riser rings and frame in accordance with Manatee County Public Works Department Utility Standards.

1.06.3 MANHOLE FRAME AND COVER

A. Existing frames and covers which must be removed to facilitate manhole rehabilitation, riser reconstruction, and/or casting alignment or grade adjustments shall be salvaged, cleaned and given two coats of an approved bituminous coating by the Contractor for replacement unless determined to be defective by Engineer. If manhole frame and/or cover are determined to be defective, Contractor shall replace with new frame and/or cover. Replacement frames and/or covers shall be furnished and installed in accordance with the Contract Documents. Frames shall be set in full mortar bed. The mortar shall be struck smooth with the interior surface of the manhole and floated with a sponge float to a surface profile of 8-10 mils.

1.06.4 CEMENTITIOUS LINER

A. Active leaks shall be stopped using hydraulic cement or chemical grout as necessary. Installation shall be in accordance with the manufacturer's recommendations.

B. All manholes to be lined shall be cleaned and scarified with a minimum of 5,000 psi water jet at a minimum water temperature of 180 degrees F. The water jet shall hit the manhole wall surface at as near perpendicular angle as possible. Cleaning the manhole walls from the ground surface without the appropriate angled nozzles will not be accepted. Manhole surface build-up of debris and loose manhole construction materials shall be removed during the cleaning process.

C. The intent of the surface preparation and cleaning work is to remove debris, films (oil, greases, etc or unsound, deteriorated concrete and to provide a structurally sound, clean surface that will enable lining materials to bond to the original substrate at adhesion strengths of that specified herein, a substrate pH of 8.3 is the minimum pH that will be considered acceptable to demonstrate that the surface preparation and cleaning have been properly performed.

D. Additional aggressive surface preparation and cleaning methods may be necessary to remove carbonated cementitious lining concrete or contaminants that remain after the cleaning performed as described above. The Contractor shall test the pH of the cleaned manhole interior surface at various locations of the manhole and when the results indicate a pH less than 8.3 then additional surface preparations and cleaning will be required. As a minimum level of effort the Contractor shall either dry sand blasting or pneumatic jackhammering with a bushing bit followed by a minimum 5,000 psi water blast.

E. Any bench, invert or service line repairs shall be made at this time using quick setting grout or repair mortar per the manufacturer's recommendations.

F. Invert repair shall be performed on all inverts with visible damage or where infiltration is present. After blocking flow through the manhole and thoroughly cleaning the invert, quick setting patch material shall be applied to the invert in an expeditious manner. The finished invert surfaces shall have a smooth surface and form a continuous monolithic conduit with the sewer pipe entering and leaving the manhole. The bench and invert shall form a watertight seal with the manhole walls, base and pipe seal.

G. Wastewater flow shall be controlled by methods which prevent contact with the new bench and invert for 6-8 hours after mortar placement. If 6-8 hours set time is not possible, a fast setting, high early strength mortar shall be used with provisions for flow control until concrete has set.

H. Fill all cracks, holes and joints that have voids using non-shrink grouts in accordance with the manufacturer's recommendations.

I. Apply Cementitious Liner Material per the Manufacturer's recommendations. Apply Cementitious Liner material so that the final thickness is 0.5-inch minimum or per the thickness required by the manufacturer's minimum specification, whichever is greater. The material shall start at the bottom of the manhole frame and extend to the water level of the invert.

J. Finishing: Trowel the surface of the liner to create a uniform smooth finish. Caution shall be taken to prevent over working the material. Once the initial cure has taken place, the exposed surface area should be given a broom finish. Thickness may be verified at any point with a wet gage.

K. If the cementitious lining material is not immediately coated with a protective coating liner, apply a seal coat compatible with the repair material to aid in curing and minimize recontamination of the substrate prior to application of the protective coating liner material.

1.06.5 PROTECTIVE COATING LINER

A. Prior to any protective coating lining perform all work shown in Section 1.06.4 above.

B. Remove any curing compounds, sealers or contaminates prior to protective coating lining.

C. Apply protective coating lining material in accordance with the manufacturer's recommendations over the waterproofing/structural repair material shown in Section 1.06.4.

D. Apply protective coating lining material in accordance to Section 09970 Surface Protection Spray System of the specifications.

1.06.6 INTERNAL MANHOLE CHINMEY SEALANT

A. Perform all work shown in Sections 1.06.4 and 1.06.5 (if 1.06.5 is required) prior to any Internal Manhole Chimney Sealant.

B. Clean all contaminates from manhole frame by sandblasting or mechanical methods as recommended by the chimney sealant manufacturer.

C. Install Internal Manhole Chimney Sealant in accordance with the manufacturer's recommendations. The Contractor shall contact the manufacture for thickness recommendations however; the final liner material shall be made no less than 170 mils.

1.06.7 EXTERNAL MANHOLE SEAL WRAP

A. When Work consists of adjusting sewer manholes or cone replacement, an external seal wrap shall be installed to the outside of concrete risers, steel risers and joints of the precast manhole in order to eliminate infiltration. Frame and cover shall be completely coated prior to installation of the external seal wrap. The external seal wrap shall be installed in accordance with the details of the Contract Documents and the manufacturer's recommendations.

1.06.8 MANHOLE INSERT

A. If existing manhole is not equipped with a watertight manhole insert, Contractor shall furnish and install a new manhole insert per Manatee County Public Works Utility Standards Section 12 and in accordance with the manufacturer's recommendations.

B. If existing manhole is equipped with a watertight manhole insert to prevent intrusion of storm water, the insert shall be cleaned and reinstalled by the Contractor, unless determined to be defective by the County. If insert is determined to be defective, Contractor shall furnish a new watertight manhole insert and install in accordance with manufacturer's recommendations at the completion of manhole rehabilitation operations.

1.07 TESTING

A. After completion of any rehabilitation operation and prior to backfilling (if required), the Contractor shall conduct the following tests on the manholes:
   1. Visual Inspection: The County and Contractor shall make a final visual inspection. Any deficiencies in the finished system shall be marked and repaired.

B. If a protective coating liner is applied, the following additional tests will be required:
   1. Wet Film Thickness Gage: During application a wet film thickness gage, meeting ASTM D4414 – Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages, shall be used to ensure a monolithic coating and uniform thickness during application.

1.08 WARRANTY

A. The Contractor shall guarantee the work to be free of defects in materials and workmanship for five-year period, unless otherwise stated, after completion and acceptance of the work. The Contractor shall repair defects in materials or workmanship, which may develop during the warranty period; and any damage to other work caused by such defects or discovered within the same period at no additional cost to the County.

1.08.1 WARRANTY INSPECTIONS

A. Conduct visual inspection prior to expiration of warranty to determine integrity of rehabilitation materials and water-tightness.
   1. Complete post inspection during first high groundwater period (spring or fall) following acceptance of work.
   2. Contractor should accompany County on inspections.
   3. Inspect a minimum of 25 percent of the manholes rehabilitated at locations selected by County.
      a. Infiltration and Inflow: None
      b. Structural Repair: Sound
      c. If more than one manhole fails warranty inspection, inspect all manholes with similar characteristics.
      d. Repair defects in accordance with Warranty.

END OF SECTION

SECTION 02640
VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall 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. All of the types of valves and appurtenances shall be products of well-established reputable firms who are fully experienced 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 standards as applicable. Valves used in waterworks applications shall comply with Section 8 of NSF Standard 61 for mechanical devices.

C. All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of potable water, reclaimed water, wastewater, etc., depending on the applications.

D. All valves and appurtenances shall be of the size shown on the drawings and, to the extent possible, all equipment of the same type on the project shall be from a single manufacturer.

E. All valves and appurtenances shall have the name of the manufacturer, year of the valve and the working pressure for which they are designed cast in raised letters upon some visible part of the body.

F. Special tools, if required for the normal operation or maintenance, shall be supplied with the equipment.

G. All hand actuated buried valves shall have three-piece adjustable valve boxes and 2-inch square AWWA operating nuts. Provide stainless steel extension stems and alignment rings where needed to bring the operating nut to within 4 feet below the box lid.

H. Water and reclaimed water system isolation valves shall be gate valves for sizes 2-inch through 12-inch and shall be butterfly valves for sizes 16-inch and larger.

I. Isolation valves for sewer force main pipelines shall be gate valves, unless otherwise noted on the plans. Tapping valves shall be used for tapping force mains. Plug valves shall be full port, have a 100% circular cross section, and must have prior written authorization from the County for use.

J. Valves shall open when turning the operating nut or wheel counterclockwise and shall close when turning clockwise.

K. All bonnet bolts, gland bolts, flange connection bolts, nuts, washers, and other trim hardware exposed to the outside environment shall be stainless steel. Thrust collar tie-rod bolts shall be stainless steel. All MJ-type underground bolts, nuts, and washers shall be stainless steel. Cor-Ten hardware can be used on the following projects:

- Force Main 28A

L. All valves shall have a factory applied, holiday free, fusion bonded epoxy coating on the interior and exterior unless otherwise noted in the plans or the following specification. All other painted items exposed to sunlight, including field painted box lids, etc., shall be painted the appropriate color with an epoxy type paint.

M. No valves with a break-way stem shall be allowed.

N. The equipment shall include, but not be limited to, the following:

1. Gate valves (Sec. 2.01)
2. Combination Pressure Reducing and Pressure Sustaining with Check Valves Option (Sec. 2.02)
3. Ball Valves (Sec. 2.03)
4. Butterfly Valves (Sec. 2.04)
5. Plug Valves (Sec. 2.05)
6. Valve Actuators (Sec. 2.06)
7. Air Release Valves (Sec. 2.07)
8. Valves Boxes (Sec. 2.08)
9. Corporation Stops and Saddles (Sec. 2.09)
10. Flange Adapters and Plain End Couplings (Sec. 2.10)
11. Hose Bibs (Sec. 2.11)
12. Swing Check Valves (Sec. 2.12)
13. Hydrants (Sec. 2.13)
14. Restrained Joints (Sec. 2.14)
15. Tapping Sleeves and Tapping Valves (Sec. 2.15)
16. Tracer Wire Boxes (Sec. 2.16)

1.02 SUBMITTALS

A. Submit to the County 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 County for approval in accordance with the Specifications.

1.03 TOOLS

Special tools, if required for normal operation and maintenance shall be supplied with the equipment.

PART 2 PRODUCTS

2.01 GATE VALVES

A. Where indicated on the drawings or necessary due to locations, size, or inaccessibility, chain wheel operators shall be furnished with the valves. Such operators shall be designed with adequate strength for the valves with which they are supplied and provide for easy operation of the valve. Chains for valve operators shall be galvanized.

B. Gate valves installed underground shall be provided with a box cast in a concrete pad and a box cover. Stainless steel or equivalent valve extension stems shall be provided to place the valve operating nut no more than 4 feet deep. One valve wrench, 6 feet in length, shall be provided for every 15 valves installed.

C. Gate valves 2 inches to 14 inches in diameter shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C509 or AWWA C515 and shall be UL listed and FM approved where applicable. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve.

D. The valves shall have a non-rising stainless steel stem to eliminate lead content. All bolts, nuts and washers shall be stainless steel to eliminate exterior corrosion and maintain fastener strength. Manufacturer shall use Never-Seez or equivalent during assembly of bolt and nut sets to prevent galling of similar metals. Stem seals shall be provided and shall be of the O-ring type, two above and one below the thrust collar. Valves that are located above grade and located in valve vaults shall be OS&Y with flanged joints.

E. The wedge shall be ductile iron fully encapsulated with an EPDM rubber. The Elastomer type shall be permanently indicated on the disc or body of the valve. The resilient sealing mechanism shall provide zero leakage at the water working pressure when installed with the line flow in either direction.

F. The valve body, bonnet, and bonnet cover shall meet or exceed all the requirements of AWWA C515.

G. Valves meeting AWWA C515 requirements shall be rated for an operating pressure of 250 psi and shall be tested in accordance with AWWA C515.

H. The valves are to have 2-inch cast or ductile iron AWWA operating nuts and shall open left or counterclockwise.

I. The valves shall be covered by a Manufacturer’s 10-year warranty on manufacturer’s defects and reasonable labor costs for replacement. Warranty shall become effective from the date of purchase by the end user and delivered within 30 days from the receipt of the purchase order. For publicly owned and maintained utilities, the end user is Manatee County Government.

J. Gate valves shall be assembled and tested in a certified ISO 9001:2000 manufacturing facility within the United States and provide their certification of meeting internationally recognized quality control procedures.

2.02 COMBINATION PRESSURE REDUCING & PRESSURE SUSTAINING WITH CHECK VALVE OPTION

A. Pressure sustaining and check valve shall be pilot operated diaphragm actuated valve with cast iron body, bronze trim, and 125-pound flanged ends. The valve shall be hydraulically operated, diaphragm type globe valve. The main valve shall have a single removable seat and a resilient disc, of rectangular cross section, surrounded on three and a half sides. No external packing glands are permitted and there shall be no pistons operating the main valve or any controls. The valve shall be equipped with isolation valves to service the pilot system while permitting flow if necessary. Main valve and all pilot controls shall be manufactured in the United States of America. Valve shall be single chamber type, with stainless steel stem.

B. Valve shall automatically reduce pressure for the downstream distribution network and sustain a minimum pressure in the high pressure main regardless of distribution demand, and as an option, shall also close when a pressure reversal occurs for check valve operations. The pilot system shall consist of two direct acting, adjustable, spring loaded diaphragm valves.

C. Valve shall be cast iron or ductile iron with main valve trim of brass and bronze. The pilot control valves shall be cast brass with 303 stainless steel trim. Valve shall be similar in all respects to Cla-Val Company, Model 92-01 or a similar control valve such as Bermad Model 723, GA Industries Model 4700 or an approved equal.

2.03 BALL VALVES

A. Ball valves for water and reclaimed water, in sizes 3/4-inch through 2-inch, shall be brass body, stem and ball per ASTM B 62, alloy 85-5-5-5, full port, full flow, 1/4-turn check, ball curb valves, rated for 300 psi, Mueller 300 (as specified in the table below), Ford B-Series, or approved equal, with compression, pack joint, flare, threaded or flanged ends as required. Ball valves for wastewater, 2-inch through 3-inch, shall be 316 stainless steel body, cap, stem and ball per ASTM A351, full port, full flow, 1/4-turn check, ball valves, steam rated for 150 psi, pressure rating 1,000 psi CWT, Apollo 76F or approved equal, with threaded or flanged ends as required.

Curb Stops for Water and Reclaimed Water

Pipe Material	Type of Connection	Model
HDPE	Compression x FIP	B-25170 *
HDPE	Pack Joint x FIP	P-25170 *
Copper	Compression x FIP	B-25170
Copper	Flare x FIP	B-25166
Stainless Steel	FIP x FIP Thread	B-20200
* Insert required, part number per manufacturer product information		

B. All valves shall be mounted in such a position that valve position indicators are plainly visible. Above grade ball valves shall have a vinyl coated lever handle. Lever handle, handle nut, and lever packing gland shall be 304 or 316 stainless steel.

C. Potable plastic service pipe material and compression and pack joint connectors shall not be used in soil that is contaminated with low molecular-weight petroleum products, aromatic hydrocarbons, chlorinated hydrocarbons or organic solvents. Appropriate service tubing shall apply.

2.04 BUTTERFLY VALVES

A. Butterfly valves shall conform to AWWA C504, Class 250 B, Mueller Lineseal XPII, DeZurik AWWA, Pratt HP-250II, or an approved equal.

B. Valve seats shall be an EPDM elastomer. Valve seats 24 inches and larger shall be field adjustable and replaceable without dismounting operator dise or shaft and without removing the valve from the line. Valves 20 inches and smaller shall have bonded or mechanically restrained seats as outlined in AWWA C504.

C. All valves shall be subject to hydrostatic and leakage tests at the point of manufacture. The hydrostatic test for Class 250 valves shall be performed with an internal hydrostatic pressure equal to 500 psi applied to the inside of the valve body of each valve. During the hydrostatic test, there shall be no leakage through the metal, the end joints or the valve shaft seal. The leakage test for the Class 250 valves shall be performed at a differential pressure of 250 psi and against both sides of the valve. No adjustment of the valve disc shall be necessary after pressure test for normal operation of valve. All valves shall be leaktight in both directions.

D. Butterfly valve actuators shall conform to AWWA C504. Gearing for the actuators shall be totally enclosed in a gear case. Actuators shall be capable of seating and unseating the disc against the full design pressure and shall transmit a minimum torque to the valve. Actuators shall be rigidly attached to the valve body.

E. The valve shaft shall be constructed of 18-8, ASTM A-276, Type 304 stainless steel and designed for both torsional and shearing stresses when the valve is operated under its greatest dynamic or seating torque. Shaft shall be of either a one piece unit extending full size through the valve disc and valve bearing or it may be of a stub shaft design. Shaft bearings shall be teflon or nylon, self-lubricated type.

F. Gearing for the operators shall be totally enclosed in a gear case in accordance with paragraph 3.8.3 of the above mentioned AWWA Standard Specification.

G. Operators shall be capable of seating and unseating the disc against the full design pressure of velocity, as specified for each class, into a dry system downstream and shall transmit a minimum torque to the valve. Operators shall be rigidly attached to the valve body.

H. The manufacturer shall certify that the required tests on the various materials and on the completed valves have been satisfactory and that the valves conform with all requirements of this Specification and the AWWA standard.

I. Where indicated on the Drawings, extension stems, floor stands, couplings, stem guides, and floor boxes as required shall be furnished and installed.

2.05 PLUG VALVES

A. Plug valves shall be eccentric, non-lubricating type with integral plug and shafts and shall be furnished with end connections and with actuating mechanisms as called for on the construction plans or as otherwise required. Valves shall seal bubble-tight or water drop-tight in both directions when tested according to the Leakage Test method of AWWA C504 with a hydrostatic pressure of 150 psi.

B. Plug valves shall also be subjected to the internal, full body Hydrostatic Test of AWWA C504 at a pressure two times the rated pressure or a minimum pressure of 300 psi, whichever is greater. During the test, there shall be no leakage through the metal, or through the end joints or shaft seal, nor shall any part of the valve be deformed.

C. Flanged valve ends shall be faced and drilled according to ANSI B 16.1, Class 125. Mechanical joint valve ends shall conform to AWWA C111. Threaded ends shall conform to the NPT requirements of ANSI B1.20.1.

D. The plug valve body, bonnet and gland shall be ductile iron per ASTM A 126, Class B. The integral plug and shafts shall be cast iron ASTM A 126, Class B, or 316 stainless steel. The entire plug, except for the shafts, shall be covered with nitrile (Buna N) rubber. The rubber compound shall have been vulcanized to the metal plug and shall have a peel strength of not less than 75 pounds per inch when tested according to ASTM D 429, method B. The valve seat shall be at least 90 percent pure nickel, welded-in overlay into the cast iron body. The top and bottom bearings shall be 316 stainless steel.

E. Plug valves shall have a full port area of 100 percent of the nominal pipe size area.

F. Valves shall have worm gear type actuators with 2-inch square operating nuts.

G. Plug valves shall be installed side-ways with plug shaft horizontal so that the plug rotates upward when it opens, with the flow entering the seat end of the valve.

H. Plug valves shall be coated inside with Protecto 401 or amine-cured novolac ceramic epoxy or another two-part epoxy suitable for sanitary sewer service which has been approved by Manatee County.

2.06 VALVE ACTUATORS

A. Butterfly valve and plug valve actuators.

Butterfly valve and plug valve actuators shall conform to the requirements for actuators presented in AWWA C 504 and shall be either manual or motor operated. Actuators shall be capable of seating and unseating the disc against the full design pressure and velocity, as specified for each class, into a dry system downstream, and shall transmit a minimum torque to the valve. Actuators shall be rigidly attached to the valve body.

B. Manual Actuators.

Manual actuators shall have permanently lubricated, totally enclosed gearing with handwheel and gear ratio sized on the basis of actual line pressure and velocities. Actuators shall be equipped with handwheel, position indicator, and mechanical stop-limiting locking devices to prevent over travel of the disc in the open and closed positions. They shall turn counter-clockwise to open valves. Manual actuators shall be of the traveling nut, self-locking type or of the worm gear type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Valves located above grade shall have handwheel and position indicator, and valves located below grade shall be equipped with a 2-inch square AWWA operating nut located at ground level and cast iron extension type valve box.

C. Motor Actuators (Modulating)

(1) The motor actuated valve controller shall include the motor, actuator unit gearing, limit switch gearing, limit switches, position transmitter which shall transmit a 4-20 mA DC signal, control power transformer, electronic controller which will position the valve based on a remote 4-20 milliamp signal, torque switches, bored and key-wayed drive sleeve for non-rising stem valves, declutch lever and auxiliary handwheel as a self-contained unit.

(2) The motor shall be specifically designed for valve actuator service using 480 volt, 60 Hertz, three phase power as shown, on the electrical drawings. The motor shall be sized to provide an output torque and shall be the totally enclosed, non-ventilated type. The power gearing shall consist of helical gears fabricated from heat treated alloy steel forming the first stage of reduction. The second reduction stage shall be a single stage worm gear. The worm shall be of alloy steel with carburized threads hardened and ground for high efficiency. The worm gear shall be of high tensile strength bronze with hobbed teeth. All power gearing shall be grease lubricated. Ball or roller bearings shall be used throughout. Preference will be given to units having a minimum number of gears and moving parts. Spur gear reduction shall be provided as required.

(3) Limit switches and gearing shall be an integral part of the valve control. The limit switch gearing shall be made of bronze and shall be grease lubricated, intermittent type and totally enclosed to prevent dirt and foreign matter from entering the gear train. Limit switches shall be of the adjustable type capable of being adjusted to trip at any point between fully opened valve and fully closed valve.

(4) The speed of the actuator shall be the responsibility of the system supplier with regard to hydraulic requirements and response compatibility with other components within the control loop. Each valve controller shall be provided with a minimum of two rotor type gear limit switches, one for opening and one for closing. The rotor type gear limit switch shall have two normally open and two normally closed contacts per rotor. Gear limit switches must be geared to the driving mechanism and in step at all times whether in motor or manual operation. Provision shall be made for two additional rotors as described above, each to have two normally open and two normally closed contacts. Each valve controller shall be equipped with a double torque switch. The torque switch shall be adjustable and will be responsive to load encountered in either direction of travel. It shall operate during the complete cycle without auxiliary relays or devices to protect the valve, should excessive load be met by obstructions in either direction of travel. The torque switch shall be provided with double-pole contacts.

(5) A permanently mounted handwheel shall be provided for manual operation. The handwheel shall not rotate during electric operations, but must be responsive to manual operation at all times except when being electrically operated. The motor shall not rotate during hand operation nor shall a fused motor prevent manual operation. When in manual operating position, the unit will remain in this position until motor is energized at which time the valve operator will automatically return to electric operation and shall remain in motor position until handwheel operation is desired. This movement from motor operation to handwheel operation shall be accomplished by a positive declutching lever which will disengage the motor and motor gearing mechanically, but not electrically. Hand operation must be reasonably fast. It shall be impossible to place the unit in manual operation when the motor is running. The gear limit switches and torque switches shall be housed in a single easily accessible compartment integral with the power compartment

of the valve control. All wiring shall be accessible through this compartment. Stepping motor drives will not be acceptable.

(6) The motor with its control module must be capable of continuously modulating over its entire range without interruption by heat protection devices. The system, including the operator and control module must be able to function, without override protection of any kind, down to zero dead zone.

(7) All units shall have strip heaters in both the motor and limit switch compartments.

(8) The actuator shall be equipped with open-stop-close push buttons, an auto-manual selector switch, and indicating lights, all mounted on the actuator or on a separate locally mounted power control station.

(9) The electronics for the electric operator shall be protected against temporary submergence.

(10) Actuators shall be Limitorque L120 with Modutronic Control System containing a position transmitter with a 4-20MA output signal or equal.

D. Motor Actuators (Open-Close)

(1) The electronic motor-driven valve actuator shall include the motor, actuator gearing, limit switch gearing, limit switches, torque switches, fully machined drive sleeve, declutch lever, and auxiliary handwheel as a self-contained unit.

(2) The motor shall be specifically designed for valve actuator service and shall be of high torque totally enclosed, nonventilated construction, with motor leads brought into the limit switch compartment without having external piping or conduit box.

(3) The motor shall be of sufficient size to open or close the valve against maximum differential pressure when voltage to motor terminals is 10% above or below nominal voltage.

(4) The motor shall be prelubricated and all bearings shall be of the anti-friction type.

(5) The power gearing shall consist of helical gears fabricated from heat treated steel and worm gearing. The worm shall be carburized and hardened alloy steel with the threads ground after heat treating. The worm gear shall be of alloy bronze accurately cut with a hobbing machine. All power gearing shall be grease lubricated. Ball or roller bearings shall be used throughout.

(6) Limit switches and gearing shall be an integral part of the valve actuator. The switches shall be of the adjustable rotor type capable of being adjusted to trip at any point between fully opened valve and fully closed valve. Each valve controller shall be provided with a minimum of two rotor type gear limit switches, one for opening and one for closing (influent valves require additional contacts to allow stopping at an intermediate position). The rotor

type gear limit switch shall have two normally open and two normally closed contacts per rotor. Additional switches shall be provided if shown on the control and/or instrumentation diagrams. Limit switches shall be geared to the driving mechanism and in step at all times whether in motor or manual operation. Each valve actuator shall be equipped with a double torque switch. The torque switch shall be adjustable and will be responsive to load encountered in either direction of travel. It shall operate during the complete cycle without auxiliary relays or devices to protect the valve should excessive load be met by obstructions in either direction of travel. Travel and thrusts shall be independent of wear in valve disc or seat rings.

(7) A permanently mounted handwheel shall be provided for manual operation. The handwheel shall not rotate during electric operation except when being electrically operated. The motor shall not rotate during hand operation, nor shall a fused motor prevent manual operation. When in manual operating position, the unit will remain in this position until motor is energized at which time the valve actuator will automatically return to electric operation and shall remain in motor position until handwheel operation is desired. Movement from motor operation to handwheel operation shall be accomplished by a positive declutching lever which will disengage the motor and motor gearing mechanically, but not electrically. Hand operation must be reasonably fast. It shall be impossible to place the unit in manual operation when the motor is running.

(8) Valve actuators shall be equipped with an integral reversing controller and three phase overload relays, Open-Stop-Close push buttons, local-remote-manual selector switch, control circuit transformer, three-phase thermal overload relays and two pilot lights in a NEMA 4X enclosure. In addition to the above, a close coupled air circuit breaker or disconnect switch shall be mounted and wired to the valve input power terminals for the purpose of disconnecting all underground phase conductors.

(9) The valve actuator shall be capable of being controlled locally or remotely via a selector switch integral with the actuator. In addition, an auxiliary dry contact shall be provided for remote position feedback.

(10) Valve A.C. motors shall be designed for operation on a 480 volt, 3-phase service. Valve control circuit shall operate from a fuse protected 120-volt power supply.

(11) Motor operators shall be as manufactured by Limitorque Corporation, Type L120 or approved equal.

2.07 AIR RELEASE VALVES

A. Air release valves shall be automatic float operated, GA Industries fig-929 for sewer applications, Fig-920 for water and reclaimed water application, or an approved equal, with inlet size and working pressure ratings as required and NPT connections.

B. Valve bodies shall be ductile iron per ASTM A 126, Class B. The orifice, float and linkage shall be stainless steel. The seat shall be (Buna N) nitrile elastomer.

2.08 VALVE BOXES

A. Buried valves shall have adjustable cast iron or HDPE valve boxes. Lids shall be cast iron drop type, and shall have "WATER", "SEWER", or "RECLAIM", as applicable, cast into the top. Lids will be painted "safety" blue for potable, purple for reclaimed, and green for sanitary sewer.

B. Cast iron boxes shall be two-piece, or three-piece, as required, screw type, Tyler Pipe, 6850 Series, Box 461-S through 668-S, with extensions, as required to make the desired box length, or an approved equal. Bottom barrel shall be 5-1/4 inches inside diameter, with a flanged bottom with sufficient bearing area to prevent settling.

C. HDPE boxes shall be two-piece, adjustable, 1/4-inch thick minimum heavy wall, high density polyethylene, with cast iron top and stainless steel adjustable stem, Trench Adapter, as manufactured by American Flow Control, or an approved equal. Bottom barrel shall have flanged bottom to prevent settling. All bolts, screws and pins shall be stainless steel.

D. Reclaimed Valve Boxes shall be square 9-inch x 9-inch load bearing marked "Reclaimed Water" and painted Pantone 522C purple.

E. All valves shall either have operating nuts within 4 feet below the top of the lid or shall have extension stems with centering guides to provide an extended operating nut within 4 feet below the lid. Extension stems shall be fixed to the valve operating nut with a stainless steel fastener.

F. All potable water, sewer, and reclaimed water grade-adjustment risers shall be cast iron material just like the valve box. No plastic or steel risers shall be allowed.

G. A centering device BoxLok or equal shall be installed in the valve box.

H. Stand pipe shall match color code of the system being installed, (blue for potable, Pantone purple 522 C for reclaimed, and green for sanitary sewer).

2.09 CORPORATION STOPS AND SADDLES

A. Corporation stops for connections to ductile iron and PVC water and reclaimed water mains shall be all red brass, alloy 85-5-5-5, per ASTM B 62, and shall conform to AWWA C800. 1-inch through 2-inch corporation stops shall be ball type, 300 psi working pressure rated, with AWWA MIP threaded inlets and compression, pack joint, flare, or FIP threaded joint outlets, Mueller as shown in the table below, or an approved equal. All joints made to CTS size HDPE tubing shall use stainless steel insert stiffeners.

Corporation Stops

Pipe Material	Type of Connection	Mueller 300 Model
HDPE	Compression x AWWA IP Thread	B-25028 (Saddle) *
HDPE	Compression x AWWA Taper Thread	B-25008 (Direct Tap) *
HDPE	Pack Joint x AWWA IP Thread	P-25028 (Saddle) *
HDPE	Pack Joint x AWWA Taper Thread	P-25008 (Direct Tap) *
Copper	Compression x AWWA IP Thread	B-25028 (Saddle)
Copper	Pack Joint x AWWA Taper Thread	B-25008 (Direct Tap)
Copper	Pack Joint x AWWA IP Thread	P-25028 (Saddle)
Copper	Pack Joint x AWWA Taper Thread	P-25008 (Direct Tap)
Copper	Flare x AWWA IP Thread	B-25028 (Saddle)
Copper	Flare x AWWA Taper Thread	B-25008 (Direct Tap)
Stainless Steel	FIP Thread x AWWA IP Thread	B-20046 (Saddle)
Stainless Steel	FIP Thread x AWWA Taper Thread	B-20045 (Direct Tap)
* Insert required, part number per manufacturer product information		

B. Potable plastic service pipe material and compression and pack joint connectors shall not be used in soil that is contaminated with low molecular-weight petroleum products, aromatic hydrocarbons, chlorinated hydrocarbons or organic solvents. Appropriate service tubing shall apply.

C. Water and reclaimed water service connections to PVC and DIP mains shall be made using red brass saddles, alloy 85-5-5-5, per ASTM B 62. Straps, washers and nuts shall be brass or stainless steel. No ductile iron, cast iron or steel saddles will be allowed. Saddles shall be Smith Blair 325 Bronze saddles with Stainless Steel or brass extra wide strap or equivalent.

D. Connections to PVC and DIP sanitary force mains for services up to 12 inches shall be made using Romac Style 306 double bolt stainless steel service saddles. For connections larger than 12 includes connections shall be made using Romac Style 305 double bolt stainless steel service saddles.

E. Service and air release valve (ARV) connections to HDPE water, reclaimed water and sewer mains may be made using Romac Style 306H saddle or approved equal. All saddles shall be properly sized per the manufacturer product information and be installed according to the manufacturer's written instructions. Connections to HDPE mains shall not be made using narrower saddles similar to the Smith-Blair 325.

2.10 FLANGED ADAPTERS AND PLAIN END COUPLINGS

Plain end couplings and adapters shall be fusion-bonded epoxy coated carbon steel with Ethylene Propylene Diene Monomer (EPDM) rubber gaskets and stainless steel nuts, bolts and spacers. Acrylonitrile butadiene (NBR) gaskets shall be used for potable water mains that are located in soil that is contaminated with low molecular-weight petroleum products or non- chlorinated organic solvents or non-aromatic organic solvents. Fluorocarbon (FKM) gaskets shall be used for potable water mains that are located in soil that is contaminated with aromatic hydrocarbons or chlorinated hydrocarbons. Fluorocarbon (FKM) gaskets shall be used for potable water mains if the soil is contaminated with aromatic

hydrocarbons or chlorinated hydrocarbons, and is also contaminated with low molecular-weight petroleum products or organic solvents. Couplings shall be Dresser Style 38, or another approved equal. Flange adapters shall have a plain end compression seal similar to the style 38, with an ANSI 125 Class flange on the opposite end, and shall be Dresser Style 128W or an approved equal. Stainless steel backup rings shall be used for force mains that are located in corrosive environments including wetwells and valve vaults.

2.11 HOSE BIBS

Hose bibs shall be 3/4" or 1" brass, polished chromium plated brass, with vacuum breaker as noted on the drawings.

2.12 SWING CHECK VALVES

A. Check valves shall be swing type, weighted lever, conforming to AWWA C508. Valves shall be iron-body, bronze-mounted, single disk, 175 psi working pressure for 2- through 12-inch, 150 psi for 14- through 30-inch, with ANSI B16.1 Class 125 flanged ends, by Mueller; No. A-2600-6-01 (sewer), No. A-2602-6-01 (water), or AVK Series 41, or an approved equal.

B. When there is no flow through the line, the disc shall hang lightly against its seat in practically a vertical position. When open, the disc shall swing clear of the waterway.

C. Check valves shall have bronze seat and body rings, extended bronze or stainless steel hinge pins and stainless steel nuts and bolts on bolted covers.

D. Valves shall be so constructed that disc and body seat may easily be removed and replaced without removing the valve from the line. Valves shall be fitted with an extended hinge arm with outside lever and weight.

2.13 HYDRANTS

Hydrants shall be dry barrel, nostalgic style, and shall be AVK Series 2780, American Darling B-84-B, Mueller Super Centurian 250, or approved equal and shall conform to AWWA C502 and UL/FM certified, and shall in addition meet the specific requirements and exceptions which follow:

A. Hydrants shall be according to manufacturer's standard pattern or nostalgic style and of standard size, and shall have one 5-inch Storz connection or equivalent with two 2½- inch hose nozzles.

B. Hydrant inlet connections shall have mechanical joints for 6-inch pipe.

C. Hydrant valve opening shall have an area at least equal to that area of a 5 1/4-inch minimum diameter circle and be obstructed only by the valve rod. Each hydrant shall be able to deliver 500 gpm minimum through its two 2 1/2 -inch hose nozzles when opened together with a loss of not more than 2 psi in the hydrant per AWWA C502.

D. The upper and lower stem rod shall be stainless steel and shall have a breakable stem-rod coupling of stainless steel, or cast iron or ductile iron with a fusion bonded epoxy coating, with stainless steel pins and clips.

E. Hydrants shall be hydrostatically tested as specified in AWWA C502 and shall be rated at 250 psi minimum.

F. The operating nut shall be 1½ -inch pentagon shaped with a protective weather cover, and open counter clockwise.

G. All nozzle threads shall be American National Standard.

H. Each nozzle cap shall be provided with a Buna N rubber washer.

I. All hydrants shall be traffic break away type and allow for 360-degree rotation to position the Storz connection/nozzle in the desired direction after installation.

J. Hydrants must be capable of being extended without removing any operating parts.

K. Hydrant extensions shall be fusion bonded epoxy coated inside and outside with a stainless-steel stem. The breakaway coupling can be fusion bonded epoxy coated or stainless steel. Only one hydrant extension is allowed per hydrant.

L. Weepholes shall be excluded from fire hydrants.

M. Hydrant main valve closure shall be of the compression type opening against the pressure and closing with the pressure. The main valve shall be faced or covered with EPDM elastomer, which shall seat on a bronze ring.

N. Hydrant bonnets, weather cover, nozzle section, caps and shoe shall be cast iron or ductile iron, and shall be holiday free fusion-bonded epoxy coated at the factory, per AWWA C550, inside and outside. Lower barrel shall be fusion bonded epoxy coated inside and outside. Aboveground parts shall also have a top coat of Sherwin-Williams Acrolon 218 HS acrylic polyurethane or approved equal; color Safety Yellow for fire hydrants that are connected to the potable water system or Pantone 522C purple for fire hydrants that are connected to the reclaimed water system.

O. Exterior nuts, bolts and washers shall be stainless steel. Bronze nuts may be used below grade.

P. All internal operating parts shall be removable without requiring excavation.

2.14 RESTRAINED JOINTS

A. Pipe joints shall be restrained by poured-in-place concrete thrust blocks or by other mechanical methods, including tie rods, Stargrip and Allgrip, as

manufactured by Star Pipe Products or Megaflange and 2000 PV, as manufactured by EBAA Iron Sales. Flanged joints may be used above ground.

B. All T-bolts, bolts, nuts, washers, and all thread rods shall be stainless steel. The use of rebar with welded thread is prohibited. Cor-Ten hardware shall be accepted only when approved by Owner/Engineer prior to bidding.

A certification from the supplier shall be provided to the County during the shop drawing review process ensuring all T-bolts, bolts, nuts, washers, and all thread rods meet the A-588 requirements and shall state the project name and contractor in the certification letter. If stainless steel is to be used, no certification letter is required.

C. Restrained joints may also be Lok-Ring, as manufactured by American Cast Iron Pipe Company, or an approved equal.

D. Restrained joint designs, which require wedges and/or shims to be driven into the joints in order to disassemble the pipe shall not be allowed.

2.15 TAPPING SLEEVES AND VALVES

A. Tapping valves shall meet the requirements of AWWA C509/C515 with ductile iron body and shall be rated for a pressure of 250 psi. The valves shall be flanged with alignment ring by mechanical joint with a nonrising stainless steel stem. All bolts, nuts and washers shall be stainless steel. Manufacturer shall use Never-Seez or equivalent during assembly of bolt and nut sets to prevent galling of similar metals. Stem seals shall be provided and shall be of the O-ring type, two above and one below the valve's thrust collar. Valve shall be designed for vertical burial and shall open counterclockwise. Operating nut shall be AWWA standard 2-inch square for valves 2 inches and up. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve to accommodate full size shell cutter. Gaskets shall cover the entire area of the flange surface and be 1/8-inch minimal thickness of red rubber. The wedge shall be ductile iron fully encapsulated with EPDM rubber. All bolts, nuts and washers between the sleeve and valve shall be stainless steel.

B. Tapping sleeves and saddles shall seal to the pipe by the use of a confined "O" ring gasket, and shall be able to withstand a pressure test of 180 psi for water lines or 150 psi for sewer force mains for one hour with no leakage in accordance with AWWA C110. A stainless steel 3/4-inch NPT test plug shall be provided for pressure testing. All bolts joining the two halves shall be stainless steel and shall be included with the sleeve or saddle. Sleeves and saddles shall be fusion applied epoxy coated (potable water only) or be made of 18-8 Type 304 stainless steel. Saddle straps shall be 18-8 Type 304 stainless steel.

2.16 TRACER WIRE TEST STATION BOXES

Tracer wire test station boxes shall be provided at plug valves, butterfly valves, blowoff valves, gate valves, fire hydrants and backflow preventers as indicated in these Standards. Tracer wire test station boxes for yard service shall be 2 ½ inch diameter, 15-inch length, ABS plastic with a cast iron rim and lid, P200NFGT as manufactured by Bingham & Taylor, or equal approved by Manatee County. Where test boxes will be in streets or subject to vehicular traffic, use B&T Model P525RD, 5 ¼ -inch diameter or equal, centered in a separate concrete pad similar to a valve box pad.

PART 3 EXECUTION

3.01 INSTALLATION

A. All valves and appurtenances shall be installed in the location shown, true to alignment and rigidly supported. Any damage occurring to the above items before they are installed shall be repaired to the satisfaction of the County.

B. After installation, all valves and appurtenances shall be tested at least two hours 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 County.

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. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections.

E. Flanged joints and mechanical joints shall be made with 316 stainless steel bolts, nuts and washers. High strength, low alloy Cor-Ten will be accepted only when approved by the Owner/Engineer prior to bidding.

F. 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.

G. 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.

H. Valve boxes with concrete bases shall be installed as shown on the Drawings. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Place cast iron box over each stem with base bearing on compacted fill and the top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box.

3.02 HYDRANTS

A. Hydrants shall be set at the locations designated by the County and/or as shown on the Drawings and shall be bedded on a firm foundation. A drainage pit on crushed stone as shown on the Drawings shall be filled with gravel or crushed stone and satisfactorily compacted. During backfilling, additional gravel or crushed stone shall be brought up around and 6" over the drain port. Each hydrant shall be set in true vertical alignment and shall be properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the plans. Felt paper shall be placed around the hydrant elbow prior to placing concrete. CARE MUST BE TAKEN TO ENSURE THAT CONCRETE DOES NOT PLUG THE DRAIN PORTS. Concrete used for backing shall be as specified herein.

B. When installations are made under pressure, the flow of water through the existing main shall be maintained at all times. The diameter of the tap shall be a minimum of 2" less than the inside diameter of the branch line.

C. The entire operation shall be conducted by workmen thoroughly experienced in the installation of tapping sleeves and valves, and under the supervision of qualified personnel furnished by the manufacturer. The tapping machine shall be furnished by the Contractor if tap is larger than 12" in diameter.

D. The Contractor shall determine the locations of the existing main to be tapped to confirm the fact that the proposed position for the tapping sleeve will be satisfactory and no interference will be encountered such as the occurrence of existing utilities or of a joint or fitting at the location proposed for the connection. No tap will be made closer than 30" from a pipe joint.

E. Tapping valves shall be set in vertical position and be supplied with a 2" square operating nut for valves 2" and larger. The valve shall be provided with an oversized seat to permit the use of full sized cutters.

F. Tapping sleeves and valves with boxes shall be set vertically or horizontally as indicated on the Drawings and shall be squarely centered on the main to be tapped. Adequate support shall be provided under the sleeve and valve during the tapping operation. Sleeves shall be no closer than 30" from water main joints. Thrust blocks shall be provided behind all tapping sleeves. Proper tamping of supporting earth around and under the valve and sleeve is mandatory. After completing the tap, the valve shall be flushed to ensure that the valve seat is clean.

3.03 SHOP PAINTING

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.

3.04 FIELD PAINTING

All metal valves and appurtenances specified herein and exposed to view shall be painted safety blue.

3.05 INSPECTION AND TESTING

All pipelines shall remain undisturbed for 24 hours to develop complete strength at all joints. All pipelines shall be subjected to a hydrostatic pressure and leak testing. Refer to Manatee County Public Works Utility Standards Part 1-Utility Standards Manual Section 1.8.7. Prior to testing, the pipe lines shall be supported in a manner approved by the County to prevent movement during tests.

All leaks shall be repaired and lines retested as approved by the County.

END OF SECTION

SECTION 02720

SANITARY SEWER BYPASS PUMPING

PART 1 GENERAL

1.01 SCOPE

The Contractor shall furnish all labor, materials, equipment and incidentals required to maintain existing and anticipated flows within the affected portion of the collection system throughout the construction period.

1.02 PUBLIC IMPACTS

The contractor shall not create a public nuisance due to excessive noise or dust, nor impact the public with flooding of adjacent lands, discharge of raw sewage, or release of other potential hazards, nor shall he encroach on or limit access to adjacent lands. No extra charge may be made for increased costs to the contractor due to any of the above.

1.03 SUBMITTALS

A. The Contractor shall, within 30 days of the date of the Notice to Proceed, submit to the Project Manager a detailed Pumping Plan for each site by-pass pumping will be needed. The Pumping Plan shall address all measures and systems to prevent a sanitary sewer overflow (SSO) as defined by the EPA. The Plan shall include as a minimum:

1. Working drawings and sketches showing work location, pump location, piping layout & routing. Show all proposed encroachment and access impacts on adjacent properties or facilities.
2. Pump, control, alarm and pipe specifications or catalog cuts. Detailed sketch of controls and alarm system.
3. Power requirements and details on methods to provide by-pass power or fueling.
4. Calculation and determination of response times to prevent an SSO after a high-water alarm. If anticipated peak flows are 750 G.P.M. or greater, an operator is required on site at all times pump is in service. If the anticipated peak flows are less than 750 G.P.M. an operator may not be required to be on site at all times; show operator on-site schedule.
5. Procedures to be taken in case of power, pump, or piping failures; including contact names and numbers for emergency notifications.
6. Frequency and specific responsibility for monitoring pump operation, fuel levels, pump maintenance and entire length of piping.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Pumps:

1. By-pass pumping system shall consist of at least a primary pump and a backup pump. Each pump shall have a minimum pumping capacity of 150% of the anticipated peak flows. When bypassing a pump station, 150% of the lift station capacity (G.P.M. & T.D.H) shall be provided.
2. Pumps shall be low noise or sound attenuated. The noise level at any operating condition, in any direction, shall not exceed 70dBA at a distance of twenty-three (23) feet (7 meters) from the pump and/or power source.

B. Controls:

The by-pass pump system shall be equipped with automatic controls and an alarm system. The automatic controls will automatically start the backup pump in the event of a high-water condition or failure of the primary pump. The alarm system will immediately notify the Contractor of a pump failure or high water condition.

C. Pipe:

Pipe shall be of adequate size and capacity to match the pumps. Pipe type and materials will depend on the particulars of the site conditions, and shall be detailed in the Pumping Plan. Contractor will provide all connections.

PART 3 EXECUTION

3.01 SITE CONDITIONS

Site conditions will vary by site. Contractor is responsible to determine and address requirements such as traffic control, excavation, connections & fittings, impacts on access to adjacent properties, routing and support of by-pass piping, etc., in the Pumping Plan.

3.02 ON-SITE MONITORING

A. All by-pass operations where the anticipated flow rates are 750 G.P.M or greater shall require an employee on-site at all times (full-time on-site monitoring attended by personnel experienced with the pumps and controls, with demonstrated ability to monitor, turn on & off, and switch between pumps while the by-pass pump system is in service.

B. By-pass operations where the anticipated flow rates are less than 750 G.P.M may not require an employee on-site at all times while the by-pass pump system is in operation. The Contractor shall have personnel experienced with the pumps and controls on site within the calculated response time to prevent an SSO after a high-water alarm.

C. During by-pass operations, the Contractor shall have posted on site with the permit, a copy of the approved Plan and the name and 24-hour contact number of the primary response person, the job site superintendent, and the construction company owner.

3.03 OPERATIONS

A. The Contractor is responsible for securing and providing power, fuel, site security, traffic control and all other supplies, materials and permits required for the by-pass pumping.

B. Contractor shall demonstrate automatic pump switching and alarm system to the satisfaction of: The County inspector, Project Manager, or Lift Stations Superintendent prior to beginning by-pass pumping. Satisfactory demonstration shall be documented by the inspector's, PM's or Lift Station Superintendent's dated signature on the posted copy of the approved Pumping Plan.

3.04 DAMAGE RESTORATION & REMEDIATION

A. The Contractor shall be responsible for any pre-pump notifications, all restoration of pre-pump conditions and any damage caused by by-pass operations.

B. Should there be an SSO caused by or as a direct result of the by-pass pumping, the contractor is responsible for all immediate & long term response, notifications, clean up, mitigation, etc. Copies of all written response plans, notifications, documentation, mitigation plans, etc., shall be submitted to the County Project Manager.

END OF SECTION

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SECTION 02999

MISCELLANEOUS WORK AND CLEANUP

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes items and operations which are not specified in detail as separate items, but may be sufficiently described as to the kind and extent of work involved. The Contractor shall furnish all labor, materials, equipment and incidentals necessary to complete all work under this Section.

B. The work of this Section may include, but is not limited to the following:

1. Restoration of roads, sidewalks, driveways, curbing and gutters, fences, guardrails, lawns, shrubbery and any other existing items damaged or destroyed.
2. Crossing utilities.
3. Relocation of existing water, reclaim water, or sewer lines less than four inches diameter, water and sanitary sewer services, low pressure gas lines, telephone lines, electric lines, cable TV lines as shown on the Contract Drawings.
4. Restoring easements (servitudes) and rights-of-way.
5. Clean up.
6. Incidental work (project photographs, testing, shop drawings, traffic control, record drawings, etc.).
7. Excavation and Embankment - As defined in the Florida Department of Transportation Standard Specifications for Road and Bridge Construction (1991 Edition or latest revision).
8. Stormwater and erosion control devices.

1.02 SUBMITTAL OF LUMP SUM BREAKDOWN

Contractor shall submit to the County, a breakdown of the lump sum bid for Miscellaneous Work and Cleanup Item in the Proposal within 10 days after date of Notice to Proceed.

1.03 WORK SPECIFIED UNDER OTHER SECTIONS

All work shall be completed in a workmanlike manner by competent workmen in full compliance with all applicable sections of the Contract Documents.

PART 2 PRODUCTS

2.01 MATERIALS

Materials required for this Section shall equal or exceed materials that are to be restored. The Contractor may remove and replace or reuse existing materials with the exception of paving.

PART 3 EXECUTION

3.01 RESTORING OF SIDEWALKS, ROADS, CURBING, FENCES AND GUARDRAILS

A. The Contractor shall protect existing sidewalks & curbing. If necessary, sidewalks & curbing shall be removed from joint to joint and replaced after backfilling. Curbing damaged during construction because of the Contractor's negligence or convenience, shall be replaced with sidewalks & curbing of equal quality and dimension at no cost to the County.

B. At the locations necessary for the Contractor to remove, store and replace existing fences and guardrails during construction, the sections removed shall be only at the direction of the County. If any section of fence is damaged due to the Contractor's negligence, it shall be replaced at no cost to the County with fencing equal to or better than that damaged and the work shall be satisfactory to the County.

C. Guardrails in the vicinity of the work shall be protected from damage by the Contractor. Damaged guardrails shall be replaced in a condition equal to those existing

D. Road crossings shall be restored in accordance with the Contract Documents and current FDOT Standards. Compensation for road restoration shall be included under the Road Restoration Bid Item if specified or under Miscellaneous Cleanup if it is not specified.

3.02 CROSSING UTILITIES

This item shall include any extra work required in crossing culverts, water courses, drains, water mains and other utilities, including all sheeting and bracing, extra excavation and backfill, or any other work required or implied for the proposed crossing, whether or not shown on the Drawings.

3.03 RELOCATIONS OF EXISTING GAS LINES, TELEPHONE LINES, ELECTRIC LINES AND CABLE TV LINES

The Contractor shall notify the proper utility involved when relocation of these utility lines is required. The Contractor shall coordinate all relocation work by the utility so that construction shall not be hindered.

3.04 RESTORING THE EASEMENTS AND RIGHTS-OF-WAY

The Contractor shall be responsible for all damage to private property due to his operations. He shall protect from injury all walls, fences, cultivated shrubbery, pavement, underground facilities, including water, sewer and reclaimed water lines and services, or other utilities which may be encountered along the easement. If removal and replacement is required, it shall be done in a workmanlike manner, at his expense, so that the replacement are equivalent to that which existed prior to construction.

3.05 STORMWATER AND EROSION CONTROL DEVICES

The Contractor shall be responsible for, provide, and install all stormwater and erosion control devices necessary to insure satisfactory compliance with the Florida Department of Environmental Protection Stormwater, Erosion, and Sedimentation Control Inspector's Manual.

END OF SECTION

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SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 WORK INCLUDED

Poured-in-place concrete slabs, thrust blocks, pile caps and pipe support cradles.

1.02 QUALITY ASSURANCE

Perform cast-in-place concrete work in accordance with ACI 318, unless specified otherwise in this Section.

1.03 TESTING LABORATORY SERVICES

A. Inspection and testing will be performed by the testing laboratory currently under contract to Manatee County in accordance with the Contract Documents.

B. Provide free access to work and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of work.

D. Tests of cement and aggregates may be performed to ensure conformance with requirements stated herein.

E. Three concrete test cylinders will be taken for every 100 cu. yds. or part thereof of each class of concrete placed each day. Smaller pours shall have cylinders taken as directed by the County.

F. One slump test will be taken for each set of test cylinders taken.

1.04 REFERENCES

A. ASTM C33 - Concrete Aggregates

B. ASTM C150 - Portland Cement

C. ACI 318 - Building Code Requirements for Reinforced Concrete

D. ASTM C260 - Air Entraining Admixtures for Concrete

E. ASTM C94 - Ready-Mixed Concrete

F. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete

G. ACI 305 - Recommended Practice for Hot Weather Concreting

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: Moderate-Type II, High early strength-Type III, Portland type, ASTM C150.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean and free from injurious amounts of oil, alkali, organic matter, or other deleterious material.

2.02 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical: ASTM C494 Type A - water reducing admixture.

2.03 ACCEPTABLE MANUFACTURERS

Acceptable Products:

1. Pozzolith
2. WRDA

2.04 ACCESSORIES

Non-shrink grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2400 psi in 2 days and 7000 psi in 28 days.

2.05 CONCRETE MIXES

A. Mix concrete in accordance with ASTM C94.

B. Provide concrete of following strength:

1. Required concrete strengths as determined by 28 day cylinders shall be as shown on the Drawings, but shall not be less than 3000 psi.
2. Select proportions for normal weight concrete in accordance with ACI 301 3.8 Method 1, Method 2, or Method 3. Add air entraining agent to concrete to entrain air as indicated in ACI 301 Table 3.4.1.
3. All mixes shall be in accordance with FDOT Specifications.

C. Use set-retarding admixtures during hot weather only when accepted by County.

D. Add air entraining agent to concrete mix for concrete work exposed to exterior.

2.06 FORMS

A. Forms shall be used for all concrete masonry, including footings. Form shall be so constructed and placed that the resulting concrete will be of the shape, lines, dimensions, appearance and to the elevations indicated on the Drawings.

B. Forms shall be made of wood, metal, or other approved material. Wood forms shall be constructed of sound lumber or plywood of suitable dimensions, free from knotholes and loose knots; where used for expose surfaces, boards shall be dressed and matched. Plywood shall be sanded smooth and fitted with tight joints between panels. Metal forms shall be of an approved type for the class of work involved and of the thickness and design required for rigid construction.

C. Edges of all form panels in contact with concrete shall be flush within 1/32-inch and forms for plane surfaces shall be such that the concrete will be plane within 1/16-inch in four feet. Forms shall be tight to prevent the passage of mortar and water and grout.

D. Forms for walls shall have removable panels at the bottom for cleaning, inspection and scrubbing-in of bonding paste. Forms for walls of considerable height shall be arranged with tremies and hoppers for placing concrete in a manner that will prevent segregation and accumulation of hardened concrete on the forms or reinforcement above the fresh concrete.

E. Molding or bevels shall be placed to produce a 3/4-inch chamfer on all exposed projecting corners, unless otherwise shown on the Drawings. Similar chamfer strips shall be provided at horizontal and vertical extremities of all wall placements to produce "clean" separation between successive placements as called for on the Plans.

F. Forms shall be sufficiently rigid to withstand vibration, to prevent displacement or sagging between supports and constructed so the concrete will not be damaged by their removal. The Contractor shall be entirely responsible for their adequacy.

G. Forms, including new pre-oiled forms, shall be oiled before reinforcement is placed, with an approved nonstaining oil or liquid form coating having a non-paraffin base.

H. Before form material is re-used, all surfaces in contact with concrete shall be thoroughly cleaned, all damaged places repaired, all projecting nails withdrawn, all protrusions smoothed and in the case of wood forms pre-oiled.

I. Form ties encased in concrete shall be designed so that after removal of the projecting part, no metal shall be within 1-inch of the face of the concrete. That part of the tie to be removed shall be at least 1/2-inch diameter or be provided with a wood or metal cone at least 1/2-inch in diameter and 1-inch long. Form ties in concrete exposed to view shall be the cone-washer type equal to the Richmond "Tyscru". Throughbolts or common wire shall not be used for form ties.

PART 3 EXECUTION

3.01 PLACING CONCRETE

A. Place concrete in accordance with ACI 304.

B. Notify County minimum 24 hours prior to commencement of concreting operations.

C. Verify anchors, seats, plates and other items to be cast into concrete are placed, held securely and will not cause hardship in placing concrete. Rectify same and proceed with work.

D. Maintain records of poured concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

E. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.

F. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's recommendations.

G. Pour concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur.

H. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solidly with non-shrink grout.

I. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify County upon discovery.

J. Conform to ACI 305 when concreting during hot weather.

3.02 SCREEDING

Screed surfaces level, maintaining flatness within a maximum deviation of 1/8" in 10 feet.

3.03 PATCHING

Allow County to inspect concrete surfaces immediately upon removal of forms. Patch imperfections as directed. All patching procedures shall be submitted to and approved by the County prior to use.

3.04 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required lines, details and elevations.

B. Repair or replace concrete not properly placed resulting in excessive honeycomb and other defects. Do not patch, fill, touch-up, repair, or replace exposed architectural concrete except upon express direction of County for each individual area.

3.05 CONCRETE FINISHING

Provide concrete surfaces to be left exposed, columns, beams and joists with smooth rubbed finish.

3.06 CURING AND PROTECTION

Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury. Maintain concrete with minimal moisture loss at relatively constant temperature for a period of 7 days or until concrete strengths reaches 75% of the 28 day design strength.

Protection against moisture loss may be obtained with spray on curing compounds or plastic sheets. Protection against heat or cold may be obtained with insulated curing blankets or forms.

3.07 CONCRETE DRIVEWAY RESTORATION

Concrete driveways shall be restored with 6 inches of 3,000 psi concrete with W2.5 X W2.5, 6X6 wire mesh. Place ½ inch expansion joint between back of curb and new concrete. Area beneath restoration shall be mechanically tamped prior to placing concrete.

3.08 CONCRETE SIDEWALK RESTORATION

Concrete sidewalks across driveways shall be restored with 6 inches of 3,000 psi concrete with W2.5 X W2.5, 6X6 wire mesh. Place ½ inch expansion joint between back of curb and new concrete. Area beneath restoration shall be mechanically tamped prior to placing concrete.

Concrete sidewalks outside of driveways shall be restored with 4 inches of 3,000 psi concrete per FDOT Design Standards, Sections 522 & 310

END OF SECTION

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SECTION 05550
AIR RELEASE ENCLOSURE

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals required to install the above ground air release enclosure as listed in the specifications and as shown on the Drawings.

1.02 RELATED WORK

The contractor shall be responsible for any related work necessary for the proper installation of enclosure. This shall include, but is not limited to, any required bypass pumping, any required earthwork and any required concrete work.

1.03 SUBMITTALS

A. Submit to the County shop drawings and schedules of all enclosure systems and appurtenances required. Submit design data and specification data sheets listing all parameters used in the enclosure system design.

B. Submit to the County the name of the enclosure supplier and a list of materials to be furnished.

1.04 REFERENCE STANDARDS

A. American Water Works Association (AWWA).

B. American Society for Testing and Materials (ASTM).

C. Where reference is made to the above standard, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

The enclosure manufacturer shall be a company specializing in the manufacture of such enclosures with at least five (5) years of successful field experience and being lab certified as meeting A.S.S.E 1060 requirements.

1.06 DELIVERY, STORAGE AND HANDLING

A. Care shall be taken in shipping, handling and placing to avoid damaging. Any material damaged in shipment shall be replaced as directed by the County.

B. Any material showing deterioration, or which has been exposed to any other adverse storage condition that may have caused damage, even though no such damage can be seen, shall be marked as rejected and removed at once from the work.

PART 2 PRODUCTS

2.01 GENERAL

All enclosures shall comply with the standard detail for shape and size and shall include a 22” square by 24” tall enclosure with a hasp for a padlock. The enclosure shall be securely attached to a concrete base with anchor brackets installed on the interior of the enclosure, through the flange base of the enclosure itself or through a stainless steel anchor hinge.

2.02 ALUMINUM ENCLOSURE

A. The roof, walls and access panels shall be constructed of mill finish aluminum, ASTM B209, solid sheet construction, with a wall thickness of one eighth inch.

B. All structural members shall be aluminum. No wood or "particle board" shall be allowed in assembly.

C. Multi-sectional enclosures shall fit together with overlapping "tongue and groove" joints and be secured internally with mechanical fasteners.

D. All assembly fasteners shall be stainless steel or aluminum.

2.03 STAINLESS STEEL ENCLOSURE

A. The roof, walls and access panels shall be constructed stainless steel, type 316, solid sheet construction, with a wall thickness of one eighth inch.

B. All structural members shall be stainless steel. No wood or "particle board" shall be allowed in assembly.

C. Multi-sectional enclosures shall fit together with overlapping "tongue and groove" joints and be secured internally with mechanical fasteners.

C. All assembly fasteners shall be stainless steel.

2.04 FIBERGLASS ENCLOSURE

A. Enclosure shall be a one-piece molded fiberglass/resin enclosure with polyester coating; a base flange for mounting to the concrete slab and a full recessed door opening with a lip. Enclosure shall be by Allied Molded Products, or equivalent. Color shall be as directed by the County.

B. Full length piano style hinge, door latch, padlock hasp and all bolts and other hardware shall be of stainless steel.

PART 3 EXECUTION

3.01 INSTALLATION

Enclosure shall be assembled and mounted plumb, level and square on the concrete pad according to the manufacturer's instructions and the contract drawings.

END OF SECTION

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SECTION 09865

SURFACE PREPARATION AND SHOP PRIME PAINTING

PART 1 GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals required for the surface preparation and application of shop primers on ferrous metals, excluding stainless steels, as specified herein.

1.02 SUBMITTALS

A. Submit to the County for approval, as provided in the Contract Drawings for shop drawings, manufacturer's specifications and data on the proposed primers and detailed surface preparation, application procedures and dry mil thickness.

B. Submit representative physical samples of the proposed primers, if required by the County.

PART 2 PRODUCTS

2.01 MATERIALS

A. Submerged Services: Shop primer for ferrous metals which will be subject to splash action or which are specified to be considered submerged service shall be sprayed with one coat of Koppers 654 epoxy Primer or Koppers Inertol Primer 621-FDA, dry film thickness 3.5 to 4.5 mils by Koppers Co., Inc., or equal.

B. Nonsubmerged Services: Shop primer for ferrous metals other than those covered by paragraph 2.01 A shall be sprayed with one coat of Koppers Pug Primer, dry film thickness 3.0 to 4.0 mils by Koppers Co., Inc. or equal.

C. Nonprimed Surfaces: Gears, bearing surfaces, and other similar surfaces obviously not to be painted shall be given a heavy shop coat of grease or other suitable rust-resistant coating. This coating shall be maintained as necessary to prevent corrosion during all periods of storage and erection and shall be satisfactory to the County up to the time of the final acceptance.

D. Compatibility of Coating Systems: Shop priming shall be done with primers that are guaranteed by the manufacturer to be compatible with their corresponding primers and finish coats specified in the Contract Documents for use in the field and which are recommended for use together.

PART 3 EXECUTION

3.01 APPLICATION

A. Surface Preparation and Priming:

1. Non submerged components scheduled for priming, as defined above, shall be sandblasted clean in accordance with SSPC-SP-6, Commercial Grade, immediately prior to priming. Submerged components scheduled for priming, as defined above, shall be sandblasted clean in accordance with SSPC-SP-10. Near White, immediately prior to priming.
2. Surfaces shall be dry and free of dust, oil, grease, dirt, rust, loose mill scale and other foreign material before priming.
3. Shop prime in accordance with approved paint manufacturer's recommendations.
4. Priming shall follow sandblasting before any evidence of corrosion has occurred and within 24 hours.

END OF SECTION

SECTION 09900

PAINTING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, scaffolding or other structures and incidentals necessary to complete this Contract in its entirety.

B. The work includes painting and finishing of all new interior and exterior exposed items above and below grade and surfaces, such as structural steel, miscellaneous metals, ceilings, walls, floors, doors, frames, transoms, roof fans, construction signs, guardrails, posts, fittings, valves, tanks, equipment and all other work obviously required to be painted unless otherwise specified herein or on the Drawings. The omission of minor items in the Schedule of Work shall not relieve the Contractor of his obligation to include such items where they come within the general intent of the Specification as stated herein.

C. The following items shall not be painted:

1. Any code-requiring labels, such as Underwriter's Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.
2. Any moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts, unless otherwise indicated.
3. Aluminum handrails (except where in contact with concrete) walkways, windows, louvers and grating unless otherwise specified herein.
4. Signs and nameplates.
5. Finish hardware.
6. Chain link fence.
7. Piping buried in the ground or embedded in concrete.
8. Concealed surfaces of pipe or crawl space.
9. Nonferrous metals, unless specifically noted otherwise.
10. Electrical switchgear and motor control centers.
11. Stainless steel angles, tubes, pipe, etc.
12. Products with polished chrome, aluminum, nickel or stainless steel finish.
13. Plastic switch plates and receptacle plates.
14. Flexible couplings, lubricated bearing surfaces, insulation and metal and plastic pipe interior.
15. Sprinkler heads.
16. Lifting chain on cranes and hoists
17. Electrical cable, festooned conductor system, cables, collector pole brackets, etc.

D. All work shall be done in strict accordance with this Specification, the Design Drawings and the painting package, including manufacturer's printed instructions.

E. The Contractor will obtain, at its own expense, all permits, licenses and inspections and shall comply with all laws, codes, ordinances, rules and regulations promulgated by authorities having jurisdiction which may bear on the Work. This compliance will include Federal Public Law 91-596 more commonly known as the "Occupational Safety and Health Act of 1970".

1.02 DEFINITIONS

A. Field Painting is the painting of new or rebuilt items at the job site. Field painting shall be the responsibility of the Contractor.

B. Shop Painting is the painting of new or rebuilt items in the shop prior to delivery to the jobsite.

C. Abbreviations The abbreviations and definitions listed below, when used in this specification, shall have the following meanings:

1. SSPC - Steel Structures Painting Council
2. Exterior - Outside, exposed to weather
3. Interior Dry - Inside, concealed or protected from weather
4. Interior Wet - Inside, subject to immersion services
5. ASTM - American Society of Test Materials
6. NACE - National Association of Corrosion Engineers
7. NSF - National Sanitation Foundation
8. AWWA - American Water Works Association

D. Dry Film Thickness shall be in Mils.

1.03 RESOLUTION OF CONFLICTS

A. It shall be the responsibility of the Contractor to arrange a meeting prior to the start of painting, or flooring installation between the Contractor, the Paint Manufacturer, whose products are to be used, and the County. All aspects of surface preparation, application and coating systems as covered by this Specification will be reviewed at this meeting.

B. Clarification shall be requested promptly from the County when instructions are lacking, conflicts occur in the Specifications, or the procedure seems improper or inappropriate for any reason.

C. Copies of all manufacturer's instructions and recommendations shall be furnished to the County by the Painting Contractor.

D. It shall be the responsibility of the Coating Manufacturer to have their factory representative meet in person with the Contractor and County a minimum of three times during the job as a consultant on surface preparation, mil thickness of coating and proper application of coating unless meeting is determined to be unnecessary by the County.

1.04 SUBMITTALS

A. Contractor shall submit catalog data and cut sheets for the painting system being used if not the TNEMEC materials specified.

B. Samples as detailed in 3.01 B shall be submitted regardless of system being used, showing each color to be used.

C. Hazardous Material Disposal documentation shall be submitted if applicable.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Effective oil and water separators shall be used in all compressed air lines serving spray painting and sandblasting operations to remove oil or moisture from the air before it is used. Separators shall be placed as far as practicable from the compressor.

B. All equipment for application of the paint and the completion of the work shall be furnished by the Contractor in first-class condition and shall comply with recommendations of the paint manufacturer.

C. Contractor will provide free of charge to the County a "Nordson-Mikrotest" or "Positest" dry film thickness gauge for ferrous metal and an OG232 "Tooke" gauge or equal for non-ferrous and cementitious surface, to be used to inspect coatings by the County and Contractor. The gauges may be used by the Contractor and returned each day to the County. County will return gauges to Contractor at completion of job.

2.02 MATERIALS

A. All materials specified herein are manufactured by the TNEMEC Company, Inc., North Kansas City, Missouri. These products are specified to establish standards of quality and are approved for use on this Project.

B. Equivalent materials of other manufacturers may be substituted on approval of the County. Requests for substitution shall include manufacturer's literature for each product giving the name, generic type, descriptive information and evidence of satisfactory past performance and an independent laboratory certification that their product meets the performance criteria of the specified materials.

C. Abrasion - Fed. Test Method Std. No. 141, Method 6192, CS-17 Wheel, 1,000 grams load.

D. Adhesion - Elcometer Adhesion Tester.

E. Exterior Exposure - Exposed at 45 degrees facing the ocean (South Florida Marine Exposure)

F. Hardness - ASTM D3363-74

G. Humidity - ASTM D2247-68

H. Salt Spray (Fog) - ASTM B117-73

I. Substitutions which decrease the total film thickness, change the generic type of coating, or fail to meet the performance criteria of the specified materials shall not be approved. Prime and finish coats of all surfaces shall be furnished by the same manufacturer.

J. All coatings to be shop applied must meet the requirements for volatile organic compounds (VOC) of not more than 3.5 lbs/gallon after thinning.

K. Colors, where not specified, shall be as selected by the County or their Representative.

L. All coatings in contact with potable water need to be NSF Certified in accordance with ANSI/NSF Standard 61.

M. All above ground potable water mains and appurtenances shall be painted safety blue.

PART 3 EXECUTION

3.01 INSPECTION OF SURFACES

A. Before application of the prime coat and each succeeding coat, all surfaces to be coated shall be subject to inspection by the County. Any defects or deficiencies shall be corrected by the Contractor before application of any subsequent coating.

B. Samples of surface preparation and of painting systems shall be furnished by the Contractor to be used as a standard throughout the job, unless omitted by the County.

C. When any appreciable time has elapsed between coatings, previously coated areas shall be carefully inspected by the County, and where, in his opinion, surfaces are damaged or contaminated, they shall be cleaned and recoated at the Contractor's expense. Recoating times of manufacturer's printed instructions shall be adhered to.

D. Coating thickness shall be determined by the use of a properly calibrated "Nordson-Mikrotest" "Positest" Coating Thickness Gauge (or equal) for ferrous metal or an OG232 "Tooke" Paint Inspection gauge (or equal) for non-ferrous and cementitious surfaces. Please note that use of the "Tooke" gauge is classified as a destructive test.

3.02 SURFACE PREPARATION

The surface shall be cleaned as specified for the paint system being used. All cleaning shall be as outlined in the Steel Structures Painting Council's Surface Preparation Specification, unless otherwise noted. If surfaces are subject to contamination, other than mill scale or normal atmospheric rusting, the surfaces shall be pressure washed, and acid or caustic pH residues neutralized, in addition to the specified surface preparation.

3.03 STANDARDS FOR SURFACE PREPARATION

A. Chemical and/or Solvent Cleaning: Remove all grease, oil, salt, acid, alkali, dirt, dust, wax, fat, foreign matter and contaminates, etc. by one of the following methods: steam cleaning, alkaline cleaning, or volatile solvent cleaning.

B. Hand Tool Cleaning: Removal of loose rust, loose mill scale and loose paint to a clean sound substrate by hand chipping, scraping, sanding and wire brushing.

C. Power Tool Cleaning: Removal of loose rust, loose mill scale and loose paint to a clean sound substrate by power tool chipping, descaling, sanding, wire brushing and grinding.

D. Flame Cleaning: Dehydrating and removal of rust, loose mill scale and some light mill scale by use of flame, followed by wire brushing.

E. White Metal Blast Cleaning: Complete removal of all mill scale, rust, rust scale, previous coating, etc., leaving the surface a uniform gray-white color.

F. Commercial Grade Blast Cleaning: Complete removal of all dirt, rust scale, mill scale, foreign matter and previous coating, etc., leaving only shadows and/or streaks caused by rust stain and mill scale oxides. At least 66% of each square inch of surface area is to be free of all visible residues, except slight discoloration.

G. Brush-Off Blast Cleaning: Removal of rust scale, loose mill scale, loose rust and loose coatings, leaving tightly-bonded mill scale, rust and previous coatings. On concrete surfaces, brush-off blast cleaning shall remove all laitance, form oils and solid contaminates. Blasting should be performed sufficiently close to the surface so as to open up surface voids, bugholes, air pockets and other subsurface irregularities, but so as not to expose underlying aggregate.

H. Pickling: Complete removal of rust and mill scale by acid pickling, duplex pickling or electrolytic pickling (may reduce the resistance of the surface to corrosion, if not to be primed immediately).

I. Near-White Blast Cleaning: Removal of all rust scale, mill scale, previous coating, etc., leaving only light stains from rust, mill scale and small specks of previous coating. At least 95% of each square inch of surface area is to be free of all visible residues and the remainder shall be limited to slight discoloration.

J. Power Tool Cleaning to Bare Metal: Complete removal of rust, rust scale, mill scale, foreign matter and previous coatings, etc., to a standard as specified on a Commercial Grade Blast Cleaning (SSPC-SP-6, NACE-3) by means of power tools that will provide the proper degree of cleaning and surface profile.

K. Visual standards "Pictorial Surface Preparation Standards for Painting Steel Surfaces", and the National Association of Corrosion Engineer, "Blasting Cleaning Visual Standards" TM-01-70 and TM-01-75 shall be considered as standards for proper surface preparation.

L. Oil, grease, soil, dust, etc., deposited on the surface preparation that has been completed shall be removed prior to painting according to Solvent Cleaning under this Specification.

M. Weld flux, weld spatter and excessive rust scale shall be removed by Power Tool Cleaning as per these Specifications.

N. All weld seams, sharp protrusions and edges shall be ground smooth prior to surface preparation or application of any coatings.

O. All areas requiring field welding shall be masked off prior to shop coating, unless waived by the County.

P. All areas which require field touch-up after erection, such as welds, burnbacks, and mechanically damaged areas, shall be cleaned by thorough Power Tool as specified in these Specifications.

Q. Touch-up systems will be same as original specification except that approved manufacturer's organic zinc-rich shall be used in lieu of inorganic zinc where this system was originally used. Also strict adherence to manufacturer's complete touch-up recommendations shall be followed. Any questions relative to compatibility of products shall be brought to the County's attention; otherwise, Contractor assumes full responsibility.

3.03 PRETREATMENTS

When specified, the surface shall be pretreated in accordance with the specified pretreatment prior to application of the prime coat of paint.

3.04 STORAGE

Materials shall be delivered to the job site in the original packages with seals unbroken and with legible unmutilated labels attached. Packages shall not be opened until they are inspected by the County and required for use. All painting materials shall be stored in a clean, dry, well-ventilated place, protected from sparks, flame, direct rays of the sun or from excessive heat. Paint susceptible to damage from low temperatures shall be kept in a heated storage space when necessary. The Contractor shall be solely responsible for the protection of the materials stored by himself at the job site. Empty coating cans shall be required to be neatly stacked in an area designated by the County and removed from the job site on a schedule determined by the County. County may request a notarized statement from Contractor detailing all materials used on the Project.

3.05 PREPARATION OF MATERIALS

A. Mechanical mixers, capable of thoroughly mixing the pigment and vehicle together, shall mix the paint prior to use where required by manufacturer's instructions; thorough hand mixing will be allowed for small amounts up to one gallon. Pressure pots shall be equipped with mechanical mixers to keep the pigment in suspension, when required by manufacturer's instructions. Otherwise, intermittent hand mixing shall be done to assure that no separation occurs. All mixing shall be done in accordance with SSPC Vol. 1, Chapter 4, "Practical Aspects, Use and Application of Paints" and/or with manufacturer's recommendations.

B. Catalysts or thinners shall be as recommended by the manufacturer and shall be added or discarded strictly in accordance with the manufacturer's instruction.

3.06 APPLICATION

A. Paint shall be applied only on thoroughly dry surfaces and during periods of favorable weather, unless otherwise allowed by the paint manufacturer. Except as provided below, painting shall not be permitted when the atmospheric temperature is below 50 deg F, or when freshly painted surfaces may be damaged by rain, fog, dust, or condensation, and/or when it can be anticipated that these conditions will prevail during the drying period.

B. No coatings shall be applied unless surface temperature is a minimum of 5deg above dew point; temperature must be maintained during curing.

C. See coating schedule for actual coating systems to be used on this project.

3.07 DEW POINT CALCULATION CHART

DEW POINT CALCULATION CHART

Ambient Air Temperature - Fahrenheit

Relative Humidity	20	30	40	50	60	70	80	90	100	110	120
90%	18	28	37	47	57	67	77	87	97	107	117
85%	17	26	36	45	55	65	76	84	95	104	113
80%	16	25	34	44	54	63	73	82	93	102	110
75%	15	24	33	42	52	62	71	80	91	100	108
70%	13	22	31	40	50	60	68	78	88	96	105
65%	12	20	29	38	47	57	66	76	85	93	103
60%	11	29	27	36	45	55	64	73	83	92	101
55%	9	17	25	34	43	53	61	70	80	89	98
50%	6	15	23	31	40	50	59	67	77	86	94
45%	4	13	21	29	37	47	56	64	73	82	91
40%	1	11	18	26	35	43	52	61	69	78	87
35%	-2	8	16	23	31	40	48	57	65	74	83

SURFACE TEMPERATURE AT WHICH CONDENSATION OCCURS

Dew Point

Temperature at which moisture will condense on surface. No coatings should be applied unless surface temperature is a minimum of 5deg above this point. Temperature must be maintained during curing.

Example

If air temperature is 70 deg F and relative humidity is 65%, the dew point is 57 deg F. No coating should be applied unless surface temperature is 62 deg F minimum.

A. No coating shall be applied unless the relative humidity is below 85%.

B. Suitable enclosures to permit painting during inclement weather may be used if provisions are made to control atmospheric conditions artificially inside the enclosure, within limits suitable for painting throughout the painting operations.

C. Field painting in the immediate vicinity of, or on, energized electrical and rotating equipment, and equipment and/or pipes in service shall not be performed without the approval of the County.

D. Extreme care shall be exercised in the painting of all operable equipment, such as valves, electric motors, etc., so that the proper functioning of the equipment will not be affected.

E. The Contractor's scaffolding shall be erected, maintained and dismantled without damage to structures, machinery, equipment or pipe. Drop cloths shall be used where required to protect buildings and equipment. All surfaces required to be clear for visual observation shall be cleaned immediately after paint application.

F. Painting shall not be performed on insulated pipe within three (3) feet of insulation operations or on insulation whose covering and surface coat have not had time to set and dry. Painting shall not be performed on uninsulated pipe within one (1) foot of any type of connection until the connection has been made, except as directed by the County.

G. The prime coat shall be applied immediately following surface preparation and in no case later than the same working day. All paint shall be applied by brushing, paint mitt and roller, conventional spraying, or airless spraying, using equipment approved by the paint manufacturer.

H. Each coat of paint shall be recoated as per manufacturer's instructions. Paint shall be considered recoatable when an additional coat can be applied without any detrimental film irregularities such as lifting or loss of adhesion.

I. Surfaces that will be inaccessible after assembly shall receive either the full specified paint system or three shop coats of the specified primer before assembly.

J. Finish colors shall be in accordance with the COLOR SCHEDULE and shall be factory mixed (i.e., there shall be no tinting by the Contractor, unless authorized by the County).

K. All edges and weld seams in immersion service shall receive a "stripe coat" (applied by brush) of the 2nd coat prior to application of the full 2nd coat.

L. All open seams in the roof area of tanks shall be filled after application of the topcoat with a flexible caulking such as Sika Flex 1A.

3.08 WORKMANSHIP

A. The Contractor must show proof that all employees associated with this Project shall have been employed by the Contractor for a period not less than six (6) months.

B. Painting shall be performed by experienced painters in accordance with the recommendations of the paint manufacturer. All paint shall be uniformly applied without sags, runs, spots, or other blemishes. Work which shows carelessness, lack of skill, or is defective in the opinion of the County, shall be corrected at the expense of the Contractor.

C. The Contractor shall provide the names of at least three other projects of similar size and scope that they have successfully completed under their current company name.

3.09 APPLICATION OF PAINT

A. By Brush and/or Rollers

1. Top quality, properly styled brushes and rollers shall be used. Rollers with a baked phenol core shall be utilized.
2. The brushing or rolling shall be done so that a smooth coat as nearly uniform in thickness as possible is obtained. Brush or roller strokes shall be made to smooth the film without leaving deep or detrimental marks.
3. Surfaces not accessible to brushes or rollers may be painted by spray, by dauber or sheepskins, and paint mitt.
4. It may require two coats to achieve the specified dry film thickness if application is by brush and roller.

B. Air, Airless or Hot Spray

1. The equipment used shall be suitable for the intended purpose, shall be capable of properly atomizing the paint to be applied and shall be equipped with suitable pressure regulators and gauges.
2. Paint shall be applied in a uniform layer, with a 50% overlap pattern. All runs and sags should be brushed out immediately or the paint shall be removed and the surface resprayed.
3. High build coatings should be applied by a cross-hatch method of spray application to ensure proper film thickness of the coating.
4. Areas inaccessible to spray shall be brushed; if also inaccessible to brush, daubs or sheepskins shall be used, as authorized by the manufacturer.
5. Special care shall be taken with thinners and paint temperatures so that paint of the correct formula reaches the receiving surface.
6. Nozzles, tips, etc., shall be of sizes and designs as recommended by the manufacturer of the paint being sprayed.
7. The first coat on concrete surfaces in immersion service should be sprayed and back rolled.

3.10 PROTECTION AND CLEANUP

A. It shall be the responsibility of the Contractor to protect at all times, in areas where painting is being done, floors, materials of other crafts, equipment, vehicles, fixtures, and finished surfaces adjacent to paint work. Cover all electric plates, surface hardware, nameplates, gauge glasses, etc., before start of painting work.

B. At the option of the County during the course of this project, the Contractor will contain all spent abrasives, old paint chips, paint overspray and debris by means suitable to the County, including, but not limited to, full shrouding of the area.

C. If shrouding is required, the Contractor must provide a complete design of the intended shroud or cover. Care must be taken not to modify or damage the structure during the use of the shroud. If damage should occur, the Contractor is held responsible for all repairs.

D. At completion of the work, remove all paint where spilled, splashed, spattered, sprayed or smeared on all surfaces, including glass, light fixtures, hardware, equipment, painted and unpainted surfaces.

E. After completion of all painting, the Contractor shall remove from job site all painting equipment, surplus materials and debris resulting from this work.

F. The Contractor is responsible for the removal and proper disposal of all hazardous materials from the job site in accordance with Local, State and Federal requirements as outlined by the Environmental Protection Agency.

G. A notarized statement shall be presented to the County that all hazardous materials have been disposed of properly including, but not limited to: name of disposal company, disposal site, listing of hazardous materials, weights of all materials, cost per pound and EPA registration number.

3.11 TOUCH-UP MATERIALS

The Contractor shall provide at the end of the Project at least one (1) gallon of each generic topcoat in each color as specified by the County for future touch-up. Two gallons may by required for (2) component materials.

3.12 ON-SITE INSPECTION

During the course of this Project, the County will reserve the option of incorporating the services of a qualified inspection service. The inspection service will be responsible for assuring the proper execution of this Specification by the successful Contractor.

3.13 STEEL - STRUCTURAL, TANKS, PIPES AND EQUIPMENT

A. EXTERIOR EXPOSURE (NON-IMMERSION)

1. System No. 73-1: Epoxy/High Build Urethane

This system is highly resistant to abrasion, wet conditions, corrosive fumes and chemical contact. Provides 3-4 times the color and gloss retention of conventional paints. Second coat to be same color or close to finish color. Specify Series 74 Endura-Shield for gloss finish.

Surface Preparation: SSPC-SP6 Commercial Blast Cleaning

Shop Coat: 66-1211 Epoxoline Primer	3.0 - 4.0
2nd Coat: 66-Color Hi-Build Epoxoline	2.0 - 3.0
3rd Coat: 73-Endura-Shield III	2.0 - 3.0
Dry Film Thickness	7.0 - 10.0
Minimum	8.0 Mils

2. System No. 73-2: High Build Urethane for Marginally Cleaned Surfaces or Topcoating Existing System

This system can be used over factory finish paint or cover non-sandblasted steel and offer the high performance of a urethane coating. Specify Series 74 Endura-Shield for gloss finish.

Surface Preparation: SSPC-SP6 Commercial Blast Cleaning or SSPC-SP3 Power Tool Cleaning

Shop Coat: Manufacturer Standard Primer (or existing coating)	1.5 - 2.0
2nd Coat: 135 Chembuild	3.0 - 5.0
3rd Coat: 73-Color Endura-Shield	2.0 - 3.0
Dry Film Thickness	6.5 - 10.0
Minimum	7.5 Mils

3. System No. 82-1: Silicone Alkyd Enamel - Gloss

Coating system for outstanding color and gloss retention and weatherability. This system will provide better performance than alkyd enamel, but not as good as a urethane. Series 82 includes a minimum of 30% silicone resin and conforms to SSPC-Paint 21-78, Type 1.

Surface Preparation: SSPC-SP6 Commercial Blast Cleaning

Shop Coat: 37H-77 Chem Prime	2.0 - 3.5
2nd Coat: 23-Color Enduratone	2.0 - 3.0
3rd Coat: 82-Color Silicone Alkyd Enamel	1.0 - 2.0
Dry Film Thickness	5.0 - 8.5
Minimum	6.0 Mils

4. System 90-97: Zinc/Epoxy/Urethane

This system offers the added corrosion protection of a zinc rich primer. Series 90-97 Tneme-Zinc is an organic zinc-rich primer that can be used for field touch up of a zinc primer or for touch up of galvanized surfaces that are damaged.

Surface Preparation: SSPC-SP6 Commercial Blast Cleaning

Shop Coat: 90-97 Tneme-Zinc	2.5 - 3.5
2nd Coat: 66-Color Hi-Build Epoxoline	2.0 - 3.0
3rd Coat: 73 Endurashield III	2.0 - 3.0
Dry Film Thickness	6.5 - 9.5
Minimum	8.0 Mils

B. INTERIOR EXPOSURE (NON-IMMERSION)

1. System No. 69.1: High Solids Epoxy

This coating will provide maximum protection. It offers chemical and corrosion resistance for long-term protection against salt spray, moisture, corrosive fumes, and chemical attack. Series 69 is a polyamidoamine cured epoxy. Primer coat must be touched-up before second coat is applied.

Surface Preparation: SSPC-SP6 Commercial Blast Cleaning

Shop Coat: 69-1211 Epoxoline Primer II	3.0 - 5.0
2nd Coat:	
69-Color Hi-Build Expoxoline II	4.0 - 6.0
Dry Film Thickness	7.0 - 11.0
Minimum	9.0 Mils

2. System No.66-2: High Build Epoxy

This system will provide chemical and corrosion resistance against abrasion, moisture, corrosion fumes, chemical contact and immersion in non-potable water. Primer coat must be touched-up before second coat is applied. Substitute Series 161 for low temperature cure or quick recoats.

Surface Preparation: SSPC-SP6 Commercial Blast Cleaning

Shop Coat: 69-1211 Epoxoline Primer	3.0 - 5.0
2nd Coat: 69-Color Hi-Build Expoxoline	4.0 - 6.0
Dry Film Thickness	7.0 - 11.0
Minimum	9.0 Mils

3. System No. 66-6: High Build Epoxy (Over OEM Finishes)

This system is to be used over standard manufacturer's primer to offer a high performance epoxy finish. Excellent for areas of rust not able to be completely cleaned.

Surface Preparation: Spot SSPC-SP6 Commercial Blast Cleaning or SSPC- SP11 Power Tool Cleaning to Bare Metal

Shop Coat: Manufacturer's Standard	
(or existing coating)	1.0 - 2.0
2nd Coat: 50-330 Poly-Ura-Prime	2.0 - 3.0
3rd Coat: 66-Color Hi-Build Expoxoline	2.0 - 4.0
Dry Film Thickness	5.0 - 9.0
Minimum	7.0 Mils

C. IMMERSION

1. System No. 69-2: High Solids Epoxy (Non-Potable Water)

This system provides maximum protection in immersion service. Scarify the surface before topcoating if the Series 69 has been exterior-exposed for 90 days or longer. If primer coat is damaged, it must be touched-up before second coat is applied.

Surface Preparation: SSPC-SP10 Near-White Blast Cleaning

Shop Coat:	
69-1211 Hi-Build Epoxoline II	3.0 - 5.0
2nd Coat:	
69-Color Hi-Build Expoxoline II	6.0 - 8.0
Dry Film Thickness	9.0 - 13.0
Minimum	11.0 Mils

2. System No. 66-2: High Solids Epoxy (Non-Potable Water)

This system will provide chemical and corrosion resistance for protection against abrasion, moisture, corrosive fumes, chemical contact and immersion. Primer coat must be touched-up before second coat is applied. Scarify the surface before topcoating if the Series 66 has been exterior-exposed for 60 days or longer. Substitute Series 161 for low temperature cure or quick recoats.

Surface Preparation: SSPC-SP10 Near-White Blast Cleaning

Shop Coat: 66-1211 Epoxoline Primer	3.0 - 5.0
2nd Coat: 66-Color Hi-Build Expoxoline	3.0 - 5.0
3rd Coat: 66-Color Hi-Build Expoxoline	3.0 - 5.0
Dry Film Thickness	9.0 - 15.0
Minimum	11.0 Mils

3. System No. 20-1: Epoxy-Polyamide (Potable Water)

This system meets American Water Works Association AWWA D 102 Inside Paint System Number 1. Series 20 meets the new requirements of approval for potable water use as established by the National Sanitation Foundation Standard 61. Substitute Series FC20 for low temperature cure or quick recoats.

Surface Preparation: SSPC-SP10 Near-White Blast Cleaning

Shop Coat:	
20-WH02 Pota-Pox (Tank White)	3.0 - 5.0
2nd Coat: 20-1255 Pota-Pox (Beige)	4.0 - 6.0
3rd Coat: 20-WH02 Pota-Pox (Tank White)	4.0 - 6.0
Dry Film Thickness	11.0 - 17.0
Minimum	12.0 Mils

4. System No. 140: High Solids Epoxy (Potable Water)

Series 140 meets the new requirements of approval for potable water use as established by the National Sanitation Foundation Standard 61.

Surface Preparation: SSPC-SP10 Near-White Blast Cleaning

Shop Coat: 140-1255 Pota-Pox II (Beige)	6.0 - 8.0
2nd Coat:	
140-WH02 Pota-Pox II (Tank White)	6.0 - 8.0
Dry Film Thickness	12.0 - 16.0
Minimum	14.0 Mils

5. System No. 46-30: Coal Tar-Epoxy (Non-Potable Water Only)

May be applied in a two-coat application. Review critical recoat time if utilized.

Surface Preparation: SSPC-SP10 Near-White Blast Cleaning*

One Coat: 46H-413 Hi-Build Tneme Tar

Minimum Dry Film Thickness 14.0 - 20.0

*SSPC-SP-6 Commercial Blast Cleaning may be used for non-immersion service.

6. System No. 46-26: Coal Tar Epoxy (Non-Potable Water Only)

Must be recoated within four days at 75deg F. Higher temperature will shorten recoat time.

Surface Preparation: SSPC-SP10 Near-White Blast Cleaning*

1st Coat: 46-413 Tneme Tar	8.0 - 10.0
2nd Coat: 46-413 Tneme Tar	8.0 - 10.0
Dry Film Thickness	16.0 - 20.0
Minimum	16.0 Mils

*SSPC-6 Commercial Blast Cleaning may be used for non-immersion service.

3.14 OVERHEAD METAL DECKING, JOIST

A. INTERIOR EXPOSURE

System No. 15-1: Uni-Bond

This system should be used on ceiling areas where a one-coat system is desired. Can be applied over steel, galvanized and aluminum decking, joist, beams, conduits and concrete.

Surface Preparation: Surfaces must be dry, clean and free of oil, grease and other contaminates. Allow concrete to cure 28 days.

Coating: 15-Color Uni-Bond
Dry Film Thickness 2.5 - 3.5

B. EXTERIOR EXPOSURE

System No. 135-1: Chembuild

This system can be applied over a wide variety of coatings and factory finishes. It can also be applied direct to galvanized aluminum decking, joists, conduits and tight rust.

Surface Preparation: Pressure clean to remove all dirt, oil, grease, chemicals and foreign contaminates. Remove loose paint and all rust by hand and power tool cleaning (SSPC-SP 2 & 3)

Coating: 135-Color Chembuild
Dry Film Thickness 3.0 - 5.0

3.15 MILL COATED STEEL PIPE

A. EXTERIOR/INTERIOR EXPOSURE (NON-IMMERSION)

System No. 66-3: Epoxy-Polyamide

This system can be applied directly to mill coated steel pipe without sandblasting for use in non-immersion. There may be some bleed through with the 1st coat. Do not apply over glossy varnish type mill coatings.

Surface Preparation: Surface shall be clean and dry.

1st Coat: 66-1211 Epoxoline Primer	3.0 - 4.0
2nd Coat: 66-Color Hi-Build Expoxoline	4.0 - 6.0
3rd Coat: (If required)	(4.0 - 6.0)
Dry Film Thickness	11.0 - 16.0
Minimum	11.0 Mils

3.16 GALVANIZED STEEL - PIPE AND MISCELLANEOUS FABRICATIONS

A. EXTERIOR / (NON-IMMERSION)

System No. 73-1: Epoxy/High Build Urethane

Series 66 has excellent adhesion to galvanized steel. This system is highly resistant to abrasion, wet conditions, corrosive fumes and chemical contact. Provides 3-4 times the color and gloss retention of conventional paints. First coat to be same color as or close to the finish color. Specify Series 74 Endura-Shield for gloss finish.

Surface Preparation: SSPC-SP1 Solvent Cleaning

1st Coat: 66-Color Hi-Build Epoxoline	2.0 - 4.0
2nd Coat: 73-Color Endura-Shield	2.0 - 4.0
Dry Film Thickness	4.0 - 8.0
Minimum	5.0 Mils

B. INTERIOR EXPOSURE (NON IMMERSION) AND ALUMINUM IN CONTACT WITH CONCRETE

System No. 66-6: Polyamide Epoxy

Surface Preparation: SSPC-SP1 Solvent Cleaning

1st Coat: 66-Color Hi-Build Epoxoline	2.0 - 4.0
2nd Coat: 66-Color Hi-Build Epoxoline	2.0 - 4.0
Dry Film Thickness	4.0 - 8.0
Minimum	5.0 Mils

C. IMMERSION (POTABLE WATER)

System No. 20-1: Epoxy-Polyamide (Potable Water)

Series 20 meets the new requirements of approval for potable water use as established by the National Sanitation Foundation Standard 61. Substitute Series FC20 for low temperature cure of quick recoat.

Surface Preparation: SSPC-SP 7 Brush Off Blast Cleaning

1st Coat: 20-1255 Pota-Pox Primer	3.0 - 5.0
2nd Coat: 20-WH02 Pota-Pox Finish	4.0 - 6.0
Dry Film Thickness	7.0 -11.0
Minimum	9.0 Mils

3.17 CHAIN-LINK FENCES

A. GALVANIZED STEEL & NON-FERROUS METAL

System No. 22-1: Oil-Cementitious

Surface Preparation: Surface shall be clean and dry

One Coat: 22-Color Galv-Gard
Dry Film Thickness 3.0 - 4.0

3.18 CONCRETE

A. EXTERIOR - ABOVE GRADE

1. System No. 52-1 Modified Epoxy - Sand Texture

Series 52 is a high build, decorative sand texture finish that hides minor surface irregularities and gives long-term protection against weather, driving rain, ultraviolet exposure, alternate freezing and thawing. Series 52 will actually become part of the concrete. Available in Series 55, Tneme-Crete smooth finish. For porous substrates, a second coat of Series 52 is required. Substitute Series 180 or 181 W.B. Tneme-Crete when specified over existing acrylic or latex coatings.

Surface Preparation: Surface shall be clean and dry.

One Coat: 52-Color Tneme-Crete
Dry Film Thickness 8.0 - 10.0

2. System No. 6-1: Acrylic Emulsion Low Sheen

If semi-gloss finish is desired, use Series 7 Tneme-Cryl SG as the second coat.

Surface Preparation: Surface must be clean and dry.

1st Coat: 6-Color Tneme-Cryl	2.0 - 3.0
2nd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
Dry Film Thickness	4.0 - 6.0
Minimum	5.0 Mils

3. System No. 156-1: Modified Acrylic Elastomer

If texture is needed, use 157 Enviro-Crete TX (medium texture) or 159 Enviro-Crete XTX (coarse texture). For application over previously applied coatings, use TNEMEC Series 151 Elasto-Grip at 1.0 - 2.5 mils DFT prior to the application of Series 156 Enviro-Crete.

Surface Preparation: Surface must be clean and dry.

1st Coat: 156-Color Enviro-Crete	4.0 - 8.0
2nd Coat: 156-Color Enviro-Crete	4.0 - 8.0
Dry Film Thickness	8.0 - 16.0
Minimum	10.0 Mils

B. EXTERIOR - BELOW GRADE

1. System No. 46-61: Coal Tar Pitch Solution

Surface Preparation: Surface must be clean and dry, Level all protrusions.

1st Coat: 46-465 H.B. Tnemecol	8.0 - 12.0
2nd Coat: 46-465 H.B. Tnemecol	8.0 - 12.0
Dry Film Thickness	16.0 - 24.0
Minimum	16.0 Mils

2. System No. 46-31: Coal Tar-Epoxy

Surface Preparation: Surface shall be clean and dry.

One Coat:	46H-413 Hi-Build Tneme-Tar
Dry Film Thickness	14.0 - 20.0

3. System No. 100-1: Crystaline Waterproofing

This system can be applied to concrete that is still wet or has not developed final cure. It can be used where wet surface conditions exist or where there is the potential for water intrusion due to hydrostatic pressure. Application shall be per Xypex specification manual.

Surface Preparation: Surface to be clean and roughened by Brush Blasting or Acid Etching.

1st Coat: XYPEX Concentrate at 1.5 lbs/SY
2nd Coat: XYPEX Modified at 1.5 lbs/SY

C. EXTERIOR/INTERIOR EXPOSURE (NON-IMMERSION)

1. System No. 6-1: Acrylic Emulsion, Low Sheen (Interior/Exterior)

This system will provide a decorative coating with good exterior durability, color retention, and a high vapor transmission rate. For Semi-Gloss finish, use 7-Color Tneme-Cryl S/G.

Surface Preparation: Surface shall be clean and dry. Allow concrete to cure for 28 days.

1st Coat: 6-Color Tneme-Cryl	2.0 - 3.0
2nd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
Dry Film Thickness	4.0 - 6.0
Minimum	5.0 Mils

2. System No. 66-4: Epoxy-Polyamide (Interior/Exterior)

Series 66 provides excellent protection from abrasion, moisture, corrosive fumes and chemical contact. For exterior exposures, topcoat with Series 73, or 74 Endura-Tone for gloss and color retention.

Surface Preparation: Surfaces shall be clean and dry. Allow concrete to cure for 28 days. SSPC-SP-7 Brush-Off Blast Clean.

1st Coat: 66-Color Hi-Build Epoxoline	3.0 - 5.0
2nd Coat: 66-Color Hi-Build Epoxoline	4.0 - 6.0
Dry Film Thickness	7.0 -11.0
Minimum	9.0 Mils

3. System No. 83-1: High Solids Catalyzed Epoxy (Interior)

Surface Preparation: Surface shall be clean and dry. Allow concrete to cure for 28 days. SSPC-SP-7 Brush Off Blast Clean. Concrete block surfaces: Allow to cure 28 days. Level fins, protrusions and mortar splatter.

1st Coat: 83-Color Ceramlon II	6.0 - 10.0
2nd Coat: 83-Color Ceramlon II	6.0 - 10.0
Dry Film Thickness	12.0 - 20.0
Minimum	14.0 Mils

D. IMMERSION - POTABLE & NON-POTABLE WATER

1. System No. 66-4: Epoxy Polyamide (Non-Potable Water)

Surface irregularities and bug holes should be filled to a smooth uniform appearance as required with TNEMEC Series 63-1500 Filler and Surfacer.

Surface Preparation: SSPC-SP-7 Brush-Off Blast Cleaning

1st Coat: 66-Color Hi-Build Epoxoline	4.0 - 6.0
2nd Coat: 66-Color Hi-Build Epoxoline	4.0 - 6.0
Dry Film Thickness	8.0 -12.0
Minimum	10.0 Mils

2. System No. 104-5: High Solids Epoxy (Non-Potable Water)

Surface irregularities and bug holes should be filled to a smooth uniform appearance as required with TNEMEC Series 63-1500 Filler and Surfacer.

Surface Preparation: SSPC-SP-7 Brush-Off Blast Cleaning

1st Coat: 104-1255 H.S. Epoxy Primer	6.0 - 10.0
2nd Coat: 104 Color H.S. Epoxy	6.0 - 10.0
Dry Film Thickness	12.0 - 20.0
Minimum	14.0 Mils

3. System No. 46-31: Coal Tar-Epoxy (Non-Potable Water)

May be applied in a two-coat application. Review critical recoat time is utilized. Surface irregularities and bugholes should be filled to a smooth uniform appearance as required with TNEMEC Series 63-1500 Filler and Surfacer.

Surface Preparation: Brush-Off Blast Cleaning

One Coat: 46H-413 Hi-Build Tneme-Tar	
Dry Film Thickness	14.0-20.0

4. System No. 45-27: Coal Tar Epoxy (Non-Potable Only)

Must be recoated within four days at 75deg F. Higher temperature will shorten recoat time.

Surface Preparation: Brush-Off Blast Cleaning

1st Coat: 46-413 Tneme Tar	8.0 - 10.0
2nd Coat: 46-413 Tneme Tar	8.0 - 10.0
Dry Film Thickness	16.0 - 20.0
Minimum	16.0 Mils

5. System No. 20-2 Epoxy-Polyamide (Potable Water)

This system meets American Water Works Association AWWA D 102 Inside System No. 1. Series 20 meets the new requirements of approval for potable water use as established by the National Sanitation Foundation Standard 61. Surface irregularities and bug holes should be filled to a smooth uniform appearance as required with TNEMEC Series 63-1500 Filler and Surfacer. (NSF Standard 61 approved). Substitute Series FC20 for low temperature cure or quick recoats.

Surface Preparation: SSPC-SP10 Near White Blast Cleaning

1st Coat: 20-1255 Pota-Pox	4.0 - 6.0
2nd Coat: 20-WH02 Pota-Pox Finish	4.0 - 6.0
Dry Film Thickness	8.0 - 12.0
Minimum	10.0 Mils

6. System No. 139-2: Epoxy-Polyamine (Potable Water)

Series 139 meets the new requirements of approval for potable water use as established by the National Sanitation Foundation Standard 61. Surface irregularities and bug holes should be filled to a smooth uniform appearance as required with TNEMEC Series 63-1500 Filler and Surfacer. (NSF Standard 61 approved.)

Surface Preparation: SSPC-SP10 Near-White Blast Cleaning

1st Coat: 139-1255 Pota-Pox II	6.0 - 8.0
2nd Coat: 139-WH02 Pota-Pox II	6.0 - 8.0
Dry Film Thickness	12.0 - 16.0
Minimum	14.0 Mils

E. INTERIOR EXPOSURE (NON-IMMERSION)

1. System No. 104-3: High Solids Expoxy

This system will produce a slick, tile-like finish that has excellent chemical and water resistance. Surface will be easy to clean.

Surface Preparation: Surface to be clean and dry.

1st Coat: 104-Color H.S. Epoxy	6.0 - 8.0
2nd Coat: 104-Color H.S. Epoxy	6.0 - 8.0
Dry Film Thickness	12.0 - 16.0
Minimum	14.0 Mils

2. System No. 113-1: Acrylic-Epoxy Semi-Gloss

This system will provide high performance and can be applied directly over existing coatings without lifting. Can be used when low odor is required during application. Specify Series 114 Tneme-Tuffcoat for Gloss Finish.

Surface Preparation: Surface must be clean and dry.

One Coat:	113-Color Tneme-Tuffcoat	
	Dry Film Thickness	4.0 - 6.0

3.19 CONCRETE FLOORS

A. EPOXY FLOOR COATINGS

1. System No. 67-1: Epoxy-Polyamide

This system will provide a durable, long-wearing coating that bonds tightly to concrete and stands up under heavy foot traffic, frequent cleaning and spillage of water, oil, grease, or chemical.

Surface Preparation: Acid Etch or Brush-Off Blast Cleaning

1st Coat: 67-Color Tnema-Tread	2.0 - 3.0
2nd Coat: 67-Color Tnema-Tread	2.0 - 3.0
Dry Film Thickness	4.0 - 6.0
Minimum	5.0 Mils

2. System No. S67-1: Epoxy-Polyamide (Non-Skid)

This system will provide the same protection and durability as System 67-1 with the addition of a non-skid finish.

Surface Preparation: Acid Etch or Brush-Off Blast Cleaning

1st Coat: S67-Color Tneme-Tread	2.0 - 3.0
2nd Coat: 67-Color Tneme-Tread	2.0 - 3.0
Dry Film Thickness	4.0 - 6.0
Minimum	5.0 Mils

3. System No. 73-12: Epoxy/Urethane

This system will provide maximum protection against chemical splash and spillage, wet conditions and abrasion. Specify Series 70 Endura-Shield for Gloss finish. First coat must be thinned 20% prior to application. For non-skid finish, specify Series S67 Tneme-Tread for the first and second coat.

Surface Preparation: Acid Etch or Brush-Off Blast Cleaning

1st Coat: 67-Color Tneme-Tread	2.0 - 3.0
2nd Coat: 67-Color Tneme-Tread	2.0 - 3.0
3rd Coat: 71-Color Endura-Shield	1.5 - 2.5
Dry Film Thickness	5.5 - 8.5
Minimum	6.5 Mils

4. System No. 281-1: High Build Polyamine-Epoxy Floor

Please refer to manufacturer's Installation Guide and Technical Data for proper installation.

Surface Preparation: Abrasive blast cleaning (refer to Installation Guide of manufacturer.

1st Coat: 201 Epoxoprime	6.0 - 8.0
2nd Coat: 281 Tneme-Glaze	6.0 - 8.0
Dry Film Thickness	12.0 - 16.0
Minimum	14.0 Mils

5. System No. 221/281: Functional Flooring (Non-Slip)

Please refer to manufacturer's Installation Guide and Technical Data for proper installation.

Surface Preparation: Abrasive blast cleaning (refer to Installation Guide of manufacturer.

1st Coat: 201 Epoxoprime	6.0 - 8.0
2nd Coat: 221 Lami-Tread (2 cts. @ 1/16" ea.)	1/8"
3rd Coat: 281 Tneme-Glaze	8.0 - 12.0
Minimum Dry Film Thickness	1/4"+

3.20 POROUS MASONRY

A. EXTERIOR/INTERIOR EXPOSURE

1. System No. 52-2: Modified Epoxy - Sand Texture

First coat of Tneme-Crete will act as a filler coat while the second coat will completely seal and finish. Long-term life and high performance. Available in Series 55 Tneme-Crete smooth finish.

Surface Preparation: Surface shall be clean and dry.

1st Coat: 52-Color Tneme-Crete 60 - 80 SF
2nd Coat: 52-Color Tneme-Crete Per Gal/Per Coat

2. System No. 6-2: Acrylic Emulsion, Low Sheen

This system will fill the block and provide a sealed surface. For Semi-Gloss Finish, use 7-Color Tneme-Cryl S/G.

Surface Preparation: Surface shall be clean and dry.

1st Coat: 54-562 Modified Epoxy Masonry Filler

	80 SF Gal
2nd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
3rd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
	*4.0 - 6.0

*Total Dry Film Thickness of Topcoats Only.

3. System No. 66-15: Epoxy-Polyamide (Interior)

Block Filler is a modified epoxy designed for high moisture.

Surface Preparation: Surface shall be clean and dry.

1st Coat: 54-660 Epoxy Masonry Filler 100	SF/Gal
2nd Coat: 66-Color Hi-Build Epoxoline	4.0 - 6.0
3rd Coat: 66-Color Hi-Build Epoxoline	4.0 - 6.0
	*8.0 - 12.0

*Total Dry Film Thickness of Topcoats Only.

4. System No. 104-6: High Solids Epoxy (Interior Only)

This system will produce a film thickness of 16 mils. The surface will be tile-like for easy cleaning and will provide protection against chemical attack, corrosive fumes, high humidity and wash down. Backfold first coat to fill porosity.

Surface Preparation: Surface to be clean and dry.

1st Coat: 104-Color H.S. Epoxy	6.0 - 10.0
2nd Coat: 104-Color H.S. Epoxy	6.0 - 10.0
Dry Film Thickness	12.0 - 20.0
Minimum	14.0 Mils

5. System No. 113-1: Acrylic-Epoxy Semi-Gloss (Interior Only)

Series 113 Tneme-Tufcoat has very low odor and can be used when painting in occupied areas. Specify Series 114 Tneme-Tufcoat for a gloss finish.

Surface Preparation: Surface must be clean and dry.

1st Coat: 130 Envirofill	100 SF/Gal
2nd Coat: 113-Color Tnema-Tufcoat*	4.0 - 6.0
	**4.0 - 6.0

* Two coats may be required if applied by roller
** Total Dry Film Thickness of Topcoats Only

6. System No. 156-1: Modified Acrylic Elastomer

If texture is needed, use 157 Enviro-Crete TX (medium texture of 159 Enviro-Crete XTX - coarse texture). For application over previously applied coatings, use TNEMEC 151 Elasto-Grip at 1.0 - 2.5 mils DFT.

Surface Preparation: Surfaces must be clean and dry.

1st Coat: 130 Envirofil	100 SF/Gal
2nd Coat: 156-Color Enviro-Crete	4.0 - 8.0
3rd Coat: 156-Color Enviro-Crete	4.0 - 8.0
Dry Film Thickness	8.0 - 16.0
Minimum	10.0 Mils
	(For 2nd & 3rd Coats)

3.21 GYPSUM WALLBOARD

A. INTERIOR EXPOSURE

1. System No. 111-5: Acrylic-Epoxy

Surface Preparation: Surface must be clean and dry.

1st Coat: 51-792 PVA Sealer	1.0 - 2.0
2nd Coat: 113 H.B. Tnemetufcoat*	4.0 - 5.0
Dry Film Thickness	5.0 - 7.0
Minimum	6.0 Mils

*Two coats may be required if application is by brush and roller.

2. System No. 66-22: Hi-Build Epoxoline

Surface Preparation: Surface must be clean and dry.

1st Coat: 51-792 PVA Sealer	1.0 - 2.0
2nd Coat: 66-Color Hi-Build Epoxoline*	4.0 - 6.0
Dry Film Thickness	5.0 - 8.0
Minimum	5.0 Mils

*Two coats may be required if applied by roller

3. System No. 6-1: Acrylic Emulsion, Low Sheen (Interior/Exterior Exposure)

This system is designed for mild use areas like office walls, laboratory ceilings, stairwells, etc. For Semi-Gloss finish, use 7-color Tneme-Cryl S/G.

Surface Preparation: Surface must be dry and clean.

1st Coat: 6-Color Tneme-Cryl	2.0 - 3.0
2nd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
Dry Film Thickness	4.0 - 6.0
Minimum	5.0 Mils

3.22 WOOD

A. EXTERIOR/INTERIOR EXPOSURE

1. System No. 23-4: Alkyd Semi-Gloss

Specify Series 2H Hi-Build Tneme-Gloss for High Gloss finish.

Surface Preparation: Surface shall be clean and dry.

1st Coat: 36-603 Undercoater	2.5 - 3.5
2nd Coat: 23 Enduratone	1.5 - 3.5
3rd Coat: 23 Enduratone	1.5 - 3.5
Dry Film Thickness	5.5 - 10.5
Minimum	6.0 Mils

2. System No. 6-5: Acrylic Latex

Substitute Series 7 if semi gloss finish is desired.

Surface Preparation: Surface shall be clean and dry.

1st Coat: 36-603 Undercoater	2.0 - 3.5
2nd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
3rd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
Dry Film Thickness	6.0 - 9.5
Minimum	7.5 Mils

3.23 PVC PIPE

A. EXTERIOR OR INTERIOR

System No. 66-23: Epoxy-Polyamide

Optional topcoat of Series 73/74 Endura-Shield would give long-term color and gloss retention for exterior exposure.

Surface Preparation: Surface shall be clean and dry.

One Coat:	66-Color Hi-Build Epoxoline
	Dry Film Thickness 4.0 - 6.0

3.24 INSULATED PIPE

A. INTERIOR EXPOSURE

System No. 6-1: Acrylic Emulsion, Low Sheen

For semi-gloss finish, use 7-Color Tneme-Cryl S/G.

Surface Preparation: Surface shall be clean and dry.

1st Coat: 6-Color Tneme-Cryl	2.0 - 3.0
2nd Coat: 6-Color Tneme-Cryl	2.0 - 3.0
Dry Film Thickness	4.0 - 6.0
Minimum	5.0 Mils

3.25 HIGH HEAT COATING

A. EXTERIOR/INTERIOR EXPOSURE

1. System No. 39-2: Silicone Aluminum (1200deg F Maximum)

   Surface Preparation: SSPC-SP10 Near-White Blast Cleaning - 1.0 Mil Surface Profile

1st Coat: 39-1261 Silicone Aluminum	1.0 - 1.5
2nd Coat: 39-1261 Silicone Aluminum	1.0 - 1.5
Dry Film Thickness	2.0 - 3.0
Minimum	2.0 Mils

2. System No. 39-4: Silicone Aluminum (600deg F Maximum)

   Surface Preparation: SSPC-SP10 Near-White Blast Cleaning - 1.0 Mil Surface Profile

1st Coat: 39-661 Silicone Aluminum	1.0 - 1.5
2nd Coat: 39-661 Silicone Aluminum	1.0 - 1.5
Dry Film Thickness	2.0 - 3.0
Minimum	2.0 Mils

3.26 SURFACES EXPOSED TO H2S/H2SO4 (SEVERE EXPOSURE/IMMERSION)

A. CEMENTITIOUS SURFACES

System No. 120-1: Vinester

Surface Preparation: Abrasive blast clean to remove all laitance, fines and contamination.

1st Coat: 120-5002 Vinester	6.0 - 10.0*
2nd Coat: 120-5003 Vinester F&S	As Required**
3rd Coat: 120-5002 Vinester	12.0 - 18.0
4th Coat: 120-5001 Vinester	12.0 - 18.0
Dry Film Thickness	30.0 - 46.0
Minimum	36.0 Mils+

*First coat is to be applied by roller application or spray applied followed by backrolling.

**All surface voids, cracks, pinholes and other defects must be filled flush with the adjacent surfaces by putty knife, trowel, float, squeegee, or other suitable method.

B. FERROUS METAL SURFACES

System No. 120-2: Vinyl Ester

Surface Preparation: SSPC-SP-5 White Metal Blast Cleaning (3.0 Mil Profile)

1st Coat: 120-5002 Vinester	12.0 - 18.0
2nd Coat: 120-5001 Vinester	12.0 - 18.0
Dry Film Thickness	24.0 - 36.0
Minimum	30.0 Mils

3.27 EXTERIOR OF PRESTRESSED CONCRETE TANKS

A. System No. 156-1: New Tanks

Surface Preparation: Surface to be clean and dry.

1st Coat: 156-Color Envirocrete	4.0 - 6.0
2nd Coat: 156-Color Envirocrete	4.0 - 6.0
Dry Film Thickness	8.0 - 12.0
Minimum	10.0 Mils

B. System No. 156-2: Existing Tanks (Previously Painted)

Major cracks (wider than 1/64") can be repaired with TNEMEC Series 152 Tneme-Tape per instructions.

Surface Preparation: Remove all dirt, oil, grease, chalk, and loose paint per high pressure water blast (min. 3500 psi).

1st Coat: 151 Elasto-Grip	1.0 - 2.5
Stripe Coat: Stripe all hairline cracks with a brushed coat of Series 156 Envirocrete	3.0 - 5.0
Topcoat: 156-Envirocrete	4.0 - 6.0
Dry Film Thickness (Cracks)	8.0 - 13.5
Dry Film Thickness (Other)	5.0 - 8.5

3.28 SECONDARY CONTAINMENT AREAS

A. System No. 66-4: Epoxy Polyamide

This system will provide excellent resistance to most chemicals including petrochemicals.

Surface Preparation: Surfaces shall be clean and dry. Allow new concrete to cure for 28 days. Abrasive Blast Clean per SSPC-SP7 (Brush Off Blast)

Primer: 66-Color Hi-Build Epoxoline	4.0 - 6.0
Topcoat: 66-Color Hi-Build Epoxoline	4.0 - 6.0
Dry Film Thickness	8.0 - 12.0
Minimum	10.0 Mils

B. System No. 61-1: Amine Epoxy

This system offers superior chemical resistance to a wide range of chemicals. Use TNEMEC Series 63-1500 between coats as a filler and surfacer wherever it is required.

Surface Preparation: Surfaces shall be clean and dry. Allow new concrete to cure for 28 days. Abrasive Blast Clean per SSPC-SP7 (Brush Off Blast).

Primer: 61-5002 Tneme-Liner (Beige)	8.0 - 12.0
Topcoat: 61-5001 Tneme-Liner (Gray)	8.0 - 12.0
Dry Film Thickness	16.0 - 24.0

C. System 262-1: Flexible Polyurethane

Multiple passes may be required to achieve recommended film thickness. See Elasto-Shield application guide for additional instructions. This product is only available in black.

Surface Preparation: Surfaces shall be clean and dry. Allow new concrete to cure for 28 days. Abrasive Blast Clean per SSPC-SP7 (Brush Off Blast)

Coating: 262 Elasto Shield (Black)
Minimum Dry Film Thickness 50.0

3.29 CLEAR WATER REPELLENT FOR CONCRETE, MASONRY AND BRICK

A. Silane Sealer (Min. 20% Solids)

Surface Preparation: Allow new concrete to cure 28 days. Clean surfaces to be sealed by abrasive blasting or waterblasting.

COATING: BRICK, CONCRETE
HULS Chem-Trete BSM 20....75-200 SF/GAL

SPLIT FACED OR POROUS MASONRY
HULS Chemtrete PB.....35-100 SF/GAL

3.30 MANHOLES, WET WELLS AND LIFT STATIONS

A. System No. 120-1: Vinester

Surface Preparation: Abrasive blast clean to remove all laitance, fines and contamination.

1st Coat: 120-5002 Vinester	6.0 - 10.0*
2nd Coat: 120-5003 Vinester F&S	As Required**
3rd Coat: 120-5002 Vinester	12.0 - 18.0
4th Coat: 120-5001 Vinester	12.0 - 18.0
Dry Film Thickness	30.0 - 46.0
Minimum	36.0 Mils+

*First coat to be applied by roller application or spray applied followed by backrolling.

**All surface voids, cracks, pinholes and other defects must be filled flush with the adjacent surfaces by putty knife, trowel, float, squeegee, or other suitable method.

B. System No. 100-1: Crystaline Waterproofing

This system can be applied to concrete that is still wet or has not developed final cure. It can be used where wet surface conditions exist or where there is the potential for water intrusion due to hydrostatic pressure.

Surface Preparation: Surface to be clean and roughened by Brush Blasting or Acid Etching.

1st Coat: XYPEX Concentrate @ 1.5 lbs./SY
2nd Coat: XYPEX Modified @ 1.5 lbs./SY

3.31 CANAL PIPE CROSSINGS

A. System 90-97: Zinc/Epoxy/Urethane for New Pipe or Pipe Requiring Removal of Existing Coatings

Surface Preparation: SSPC-SP6 Commercial Blast Cleaning

Primer: 90-97 Tneme-Zinc	2.5 - 3.5
2nd Coat: 66-Color Hi-Build Epoxoline	2.0 - 3.0
3rd Coat: 74-Color Endurashield	2.0 - 3.0
Dry Film Thickness	6.5 - 9.5
Minimum	8.0 Mils

B. System No. 135-2: High Build, High Gloss Urethane for Marginally Cleaned Surfaces or Topcoating Over Existing Systems

Surface Preparation: High Pressure Water Blast (min. 3500 psi) or Solvent Clean (SSPC-SP1) and Spot Hand and Power Tool Clean (SSPC-SP 2 & 3) or Brush Blast (SSPC-SP7). Existing coatings must be clean, dry and tightly adhering prior to application of coatings.

1st Coat: 135-Color Chembuild	3.0 - 4.0
2nd Coat: 74-Color Endurashield	2.0 - 3.0
Minimum Dry Film Thickness	5.0

C. Ductile Iron Pipe (Above grade)

A test patch is always recommended to insure proper adhesion to existing coatings without lifting of existing coatings.

Surface Preparation: Clean and dry. (Do not solvent clean.)

1st Coat: TNEMEC Series 66*	3.0 - 5.0
2nd Coat: TNEMEC Series 66	3.0 - 5.0
Minimum Dry Film Thickness	6.0 - 10.0

*Allow the black asphaltic coating to "bleed" through the first coat. After the first coat is cured, apply second coat.

3.32 PROJECT DESIGNER SYSTEMS REFERENCE GUIDE

A. STEEL

EXTERIOR (NON-IMMERSION)

A.1 System No. 73-1: Epoxy/High Build Urethane
A.2 System No. 73-2: High Build Urethane
A.3 System No. 2H-3: Alkyd Gloss
A.4 System 90-97: Zinc/Epoxy/Urethane

INTERIOR EXPOSURE (NON-IMMERSION)

B.1 System No. 69-1: High Solids Epoxy
B.2 System No. 66-2: High Build Epoxy
B.3 System No. 66-6: High Build Epoxy

IMMERSION

C.1 System No. 69-2: High Solids Epoxy (Non-Potable)
C.2 System No. 66-2: High Build Epoxy (Non-Potable)
C.3 System No. 20-1: Epoxy-Polyamide (Potable)
C.4 System No. 140: High Solids Epoxy (Potable Water)
C.5 System No. 46-30: High Build Coat Tar Epoxy (Non-Potable Only)
C.6 System No. 46-26: Coal Tar Epoxy (Non Potable Water Only)

B. OVERHEAD METAL DECKING, JOIST (INTERIOR EXPOSURE)

System No. 15-1: Uni-Bond

C. OVERHEAD METAL DECKING, JOINT (EXTERIOR EXPOSURE)

System No. 135-1: Chembuild

D. MILL COATED STEEL PIPE

System No. 66-3: Epoxy Polyamide

E. GALVANIZED STEEL-PIPE AND MISCELLANEOUS FABRICATORS

System No. 73-1: Epoxy/High Build Urethane

F. GALVANIZED STEEL-INTERIOR EXPOSURE (NON-IMMERSION) AND ALUMINUM IN CONTACT WITH CONCRETE

System No. 66-6: Polyamide Epoxy

G. GALVANIZED STEEL - IMMERSION (POTABLE WATER)

System No. 20-1: Epoxy Polyamide (Potable Water)

H. CHAIN LINK FENCES

System No. 22-1: Oil-Cementitious

I. CONCRETE

EXTERIOR-ABOVE GRADE

A.1 System No. 52-1: Modified Epoxy-Sand Texture
A.2 System No. 6-1: Acrylic Emulsion Low Sheen
A.3 System No. 156-1: Modified Acrylic Elastomer

EXTERIOR-BELOW GRADE

B.1 System No. 46-61: Coal Tar Pitch Solution
B.2 System No. 46-31: Coal Tar Epoxy
B.3 System No. 100-1: Crystaline Waterproofing

EXTERIOR/INTERIOR EXPOSURE (NON-IMMERSION)

C.1 System No. 6-1: Acrylic Emulsion Low Sheen
C.2 System No. 66-4: Epoxy-Polyamide
C.3 System No. 83-1: High Solids Catalyzed Epoxy

IMMERSION (POTABLE & NON-POTABLE)

D.1 System No. 66-4: Epoxy-Polyamide (Non-Potable)
D.2 System No. 104-5: High Solids Epoxy (Non-Potable)
D.3 System No. 46-31: High Build Coal Tar Epoxy (Non-Potable Only)
D.4 System No. 46-27: Coal Tar Epoxy (Non Potable Only)
D.5 System No. 20-2: Epoxy Polyamide (Potable)
D.6 System No. 139-2: Epoxy Polyamide (Potable)

INTERIOR EXPOSURE (NON-IMMERSION)

E.1 System No. 104-3: High Solids Epoxy
E.2 System No. 113-1: Acrylic Epoxy Semi-Gloss

J. CONCRETE FLOORS

A.1 System No. 67-1: Epoxy-Polyamide
A.2 System No. S67-1: Epoxy-Polyamide (Non-Skid)
A.3 System No. 73-12: Epoxy/Urethane
A.4 System No. 281-1: High Build Polyamide-Epoxy Flooring
A.5 System No. 221/281: Functional Flooring (Non-Slip)

K. POROUS MASONRY - EXTERIOR/INTERIOR EXPOSURE

A.1 System No. 52-2: Modified Epoxy-Sand Texture
A.2 System No. 6-2: Acrylic Emulsion, Low Sheen
A.3 System No. 66-15: Epoxy-Polyamide (Interior)
A.4 System No. 104-6: High Solids Epoxy (Interior Only)
A.5 System No. 113-1: Acrylic Epoxy Semi-Gloss (Interior Only)
A.6 System No. 156-1: Modified Acrylic Elastomer

L. GYPSUM WALLBOARD

A.1 System No. 111-5: Acrylic Epoxy
A.2 System No. 66-22: Hi-Build Epoxoline
A.3 System No. 6-1: Acrylic Emulsion, Low Sheen

M. WOOD EXTERIOR/INTERIOR EXPOSURE

A.1 System No. 23-4: Alkyd Semi-Gloss
A.2 System No. 6-5: Acrylic Latex

N. PVC PIPE EXTERIOR/INTERIOR EXPOSURE

A.1 System No. 66-23: Epoxy-Polyamide

O. INSULATED PIPE-INTERIOR EXPOSURE

A.1 System No. 6-1: Acrylic Emulsion, Low Sheen

P. HIGH HEAT SURFACES-FERROUS METAL

A.1 System No. 39-2: Silicone Aluminum (1200deg F Maximum)
A.2 System No. 39-4: Silicone Aluminum (600deg F Maximum)

Q. SURFACES EXPOSED TO H_2S/H_2SO_4 (SEVERE EXPOSURE/IMMERSION)

A.1 System No. 120-1: Vinester

R. EXTERIOR OF PRESTRESSED CONCRETE TANKS

A. System 156-1: New Tanks
B. System 156-2: System 156-2 Existing Tanks (Previously Painted)

S. SECONDARY CONTAINMENT AREAS

A. System No. 64-4: Epoxy Polyamide
B. System No. 61-1: Amine Epoxy
C. System No. 262-1: Flexible Polyurethane

T. CLEAR WATER REPELLENT FOR CONCRETE, MASONRY AND BRICK

A. Silane Sealer (Min. 20% Solids)

U. MANHOLES, WET WELLS & LIFT STATIONS

A. System No. 120-1: Vinester
B. System No. 100-1: Crystaline Waterproofing

V. CANAL PIPE CROSSINGS

A. System No. 90-97: Zinc/Epoxy/Urethane
B. System No. 135-2: High Build/High Gloss Urethane
C. Ductile Iron Pipe Above Grade: Series 66 High Build Epoxy

3.33 COATING SCHEDULE - TO BE DEVELOPED BY PROJECT AS NEEDED

END OF SECTION

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APPENDIX A - PERMITS

FLORIDA DEPARTMENT OF TRANSPORTATION

UTILITY PERMIT

December 14, 2016

PERMIT NO: 2018-H-194-227

STATE ROAD INFORMATION

County:	Section:	State Road No:	Beginning Mile Post:	Ending Mile Post:
Manatee	13010000	SR 45	5.008	5.008

APPLICANT INFORMATION

The Utility Agency Owner (UAO) shall be identified in this Applicant Information Box. When the UAO is a City or County and desires to have the Utility Builder make a joint permit applicant, as prescribed in Section 2.1(4) of the 2017 Utility Accommodation Manual (UAM), the Utility Builder shall also be identified in this Applicant Information Box. A Utility Builder alone cannot apply for a utility permit without the City or County adding them as a joint applicant.

Utility Agency/Owner (UAO)

Name: Manatee County
Contact Person: Manatee County
Address: 1022 26th Avenue East
City: Bradenton
State: Florida
Zip: 342083926
Telephone: 94170874877487
Email: sia.mollanazar@mymanatee.org

Utility Builder (only applicable when the UAO is a City or County)

Name:
Contact Person:
Address:
City:
State:
Zip:
Telephone:
Email:

WORK DESCRIPTION

The Applicant(s) requests permission from the Florida Department of Transportation (FDOT) to construct, operate, and maintain the utilities as described below and as depicted in the incorporated documentation.

The purpose of this project involves the replacement of the existing 10" force main with approximately 2,180 linear foot of directional drill that will connect Manatee County's Lift Station 26A to a Manatee County manhole. Approximately 84 linear feet of 10" HDPE with 16" HDPE casing directional drill will cross FDOT right of way at the intersection of Orlando Avenue and US-41(14th Street West).

Utility Work No:

Additional sheets are attached and are incorporated into this permit Yes ☐ No ☑

For FDEP certification, the FDOT agency report is attached in accordance with UAM Section 2.4.1 (13) Yes ☐ No ☑

TRAFFIC CONTROL (TCP)

☑ The TCP will comply with the following 600 series index(es) 600, 615, 616

☐ A TCP has been attached and incorporated into this permit application in compliance with UAM Section 2.4.2.

MOT Technician's contact information (may be supplied at the two (2) business day notification to FDOT):

Name: _____ Telephone _____ Email: _____

COMMENCEMENT OF WORK

The UAO and/or Utility Builder shall commence actual construction in good faith within sixty (60) calendar days after approval of the permit application. If the beginning date is more than sixty (60) calendar days from the date of approval, the UAO and/or Utility Builder must review the permit with the FDOT Approving Engineer listed to make sure no changes have occurred to the transportation facility that would affect the permit's continued approval. The UAO and/or Utility Builder shall make good faith efforts to expedite the work and complete the work within the calendar days indicated.

Anticipated Start Date: 1/16/2019

Calendar days needed to completed: 437

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2018-H-194-227

APPLICANT SIGNATURE

By the below signature(s) the UAO and/or Utility Builder agree(s) to construct, operate, and maintain the work as noted in the above Work Description, shown in plans and incorporated documents, in compliance with the UAM, all instructions noted in the FDOT Special Instructions Box, and special instructions incorporated into this permit. The UAO and/or Utility Builder declares, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans of the work areas. In accordance with UAM Section 2.8, the UAO and/or Utility Builder further declares that a letter of notification was delivered to the owners of other facilities within the work areas and that those listed below are the only facility owners known to be involved or potentially impacted by the proposed work.

Date Notified:	Name of other facility owners (attach additional sheets if necessary).
10/10/2017	Frontier
10/10/2017	Spectrum
10/10/2017	TECO Peoples Gas
10/10/2017	Fibernet Direct
2/8/2017	Manatee County

Utility Agency/Owner	Utility Builder (when applicable)
Signature: SIA MOLLANAZAR (digital signature) Date: 8/3/2018	Signature: _____ Date: _____
Name (printed): SIA MOLLANAZAR	Name (printed): _____
Title: _____	Title: _____

FDOT PROJECT INFORMATION

Pursuant to UAM Section 2.1(10), the utility work is within FDOT projects listed below and must have a Utility Work Schedule for each project approved prior to commencement of work within the FDOT project limits:

There are NO FDOT constructions (proposed or underway).
This work is NOT related to an approved Utility Work Schedule.

FDOT SPECIAL INSTRUCTIONS

In accordance with UAM Section 2.7, FDOT incorporates the below and attached special instructions into this permit.

1. OPERATIONS OFFICE IS NOTIFIED 48 HOURS IN ADVANCE OF STARTING WORK. PERMIT VOID UNLESS DOT MANATEE
PHONE: (941) 708-4400
2. IF A LANE CLOSURE IS WITHIN THE PROJECT LIMITS, THE PERMITTEE MUST SUBMIT THROUGH THE LANE CLOSURE INFORMATION SYSTEM AT HTTP://LCIS.DOT.STATE.FL.US/ TWO WEEKS PRIOR FOR A REQUESTED LANE CLOSURE TO INFORM THE MOTORING PUBLIC. FAILURE TO COMPLY MAY RESULT IN A DELAY TO BEGIN WORK.

Additional FDOT Special Instructions are attached and incorporated into this permit. Yes ☐ No ☑

PERMIT APPROVAL

By signature below, FDOT gives permission to the UAO and /or Utility Builder to construct, operate, and maintain the utilities indicated in this Utility Permit in compliance with the UAM, all incorporated documents, and special instructions. Any changes to the approved work must be approved by the FDOT's Approving Engineer and attached and incorporated into this permit in accordance with UAM Section 2.11.

Approving Engineer: Leon Herndon (digital signature) Date: 9/19/2018
Name: Leon Herndon
Title: MAINTENANCE MANAGER/PERMITS

Notification of Utility Work to be provided to: Telephone (941) 708-4400 ext. 4436 or Email: leon.herndon@dot.state.fl.us

An FDOT Representative is required to be present on the worksite prior to commencement of work. Yes ☐ No ☑

Rep. Name: _____ Telephone _____ Email: _____

Approved
2018-H-194-227
Leon Herndon
9/19/2018

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2018-H-194-227

CERTIFICATION

I, the undersigned UAO and/or Utility Builder, hereby CERTIFY that the utilities were constructed and inspected in compliance with the UAM all incorporated documents, and special instructions. Pursuant to UAM Section 2.11, all changes have been approved by the FDOT's Approving Engineer and incorporated into this permit along with all other material certifications, test results, bore logs, approved plans changes, as-built plans or other required documentation.

I also CERTIFY that work began on _____ and was completed on _____ and that the area was left in as good or better condition than when the work began.

Utility Agency/Owner	Utility Builder (when applicable)
Signature: _____ Date _____	Signature:_____ Date _____
Name (printed): _____	Name (printed): _____
Title: _____	Title: _____

FINAL INSPECTION OF WORK

☐ The work was inspected and found to be in non-compliance as noted below:

☐ All issues of non-compliance listed above have been brought into compliance and/or FDOT has no outstanding issues that need to be addressed by the UAO and/or Utility Builder. However, this final inspection does not release the UAO and/or Utility Builder of their continuing responsibilities pursuant to Rule 14-46.001, the UAM, all incorporated documents, and special instructions.

FDOT Inspector: _____ Date: _____

Name: _____

Title: _____

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

LEGEND
OPEN CUT
HDD

14TH STREET WEST

5TH STREET WEST

19 20 21 22 23

10" PVC FM
PROPOSED POINT OF CONNECTION TO PROPOSED MANHOLE

10" PLUG VALVE

10" PLUG VALVE

LIFT STATION 26A
RTU#418

ORLANDO AVENUE

ORLANDO AVENUE

ARV ASSEMBLY

10" HDPE FM

10" PVC FM

ARV ASSEMBLY

10" HDPE FM

10" PVC FM

14TH STREET WEST

MINEOLA STREET

ORLANDO CIRCLE

PARK ACRES DRIVE

No.	REVISIONS	DATE	BY

Kimley»Horn

655 NORTH FRANKLIN STREET, SUITE 150, TAMPA, FL 33602
PHONE: 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400016
DATE	9/7/2018
SCALE	AS SHOWN
DESIGNED BY	WWW
DRAWN BY	LMB
CHECKED BY	WEW

Manatee County FLORIDA

END OF SERVICE LIFE - PACKAGE A:
FM 28A/ PORT MANATEE/ ORLANDO AVE.

MANATEE COUNTY FL

LICENSED PROFESSIONAL

W. WADE WOOD, P.E

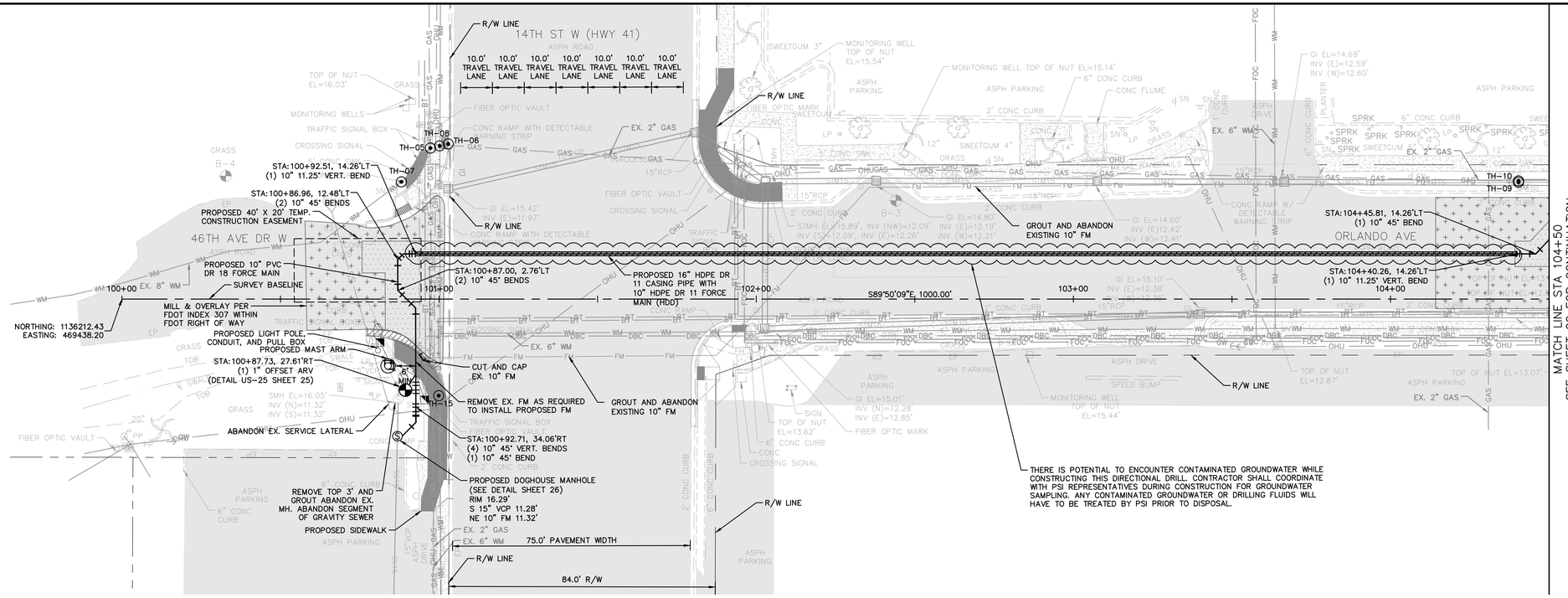
FL LICENSE NUMBER
69051

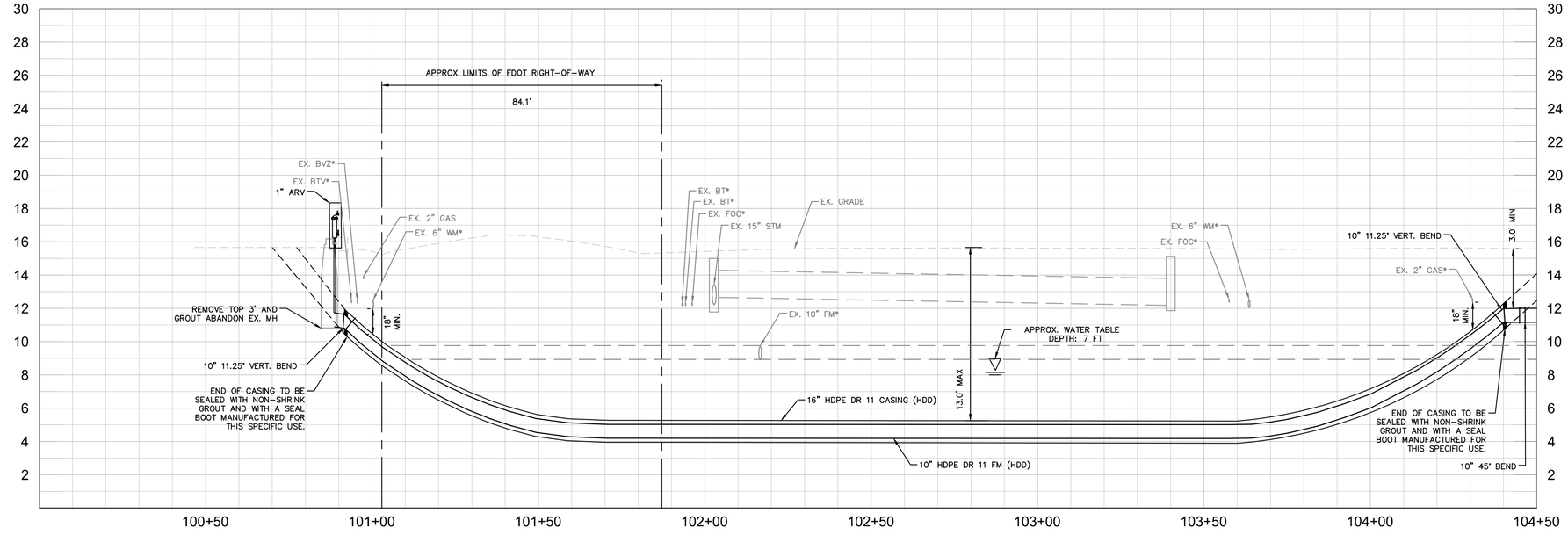
DATE:

ORLANDO AVE. FORCE MAIN KEY SHEET

SHEET NUMBER
18

Approved
2018-H-194-227
Leon Herndon
9/19/2018





NORTH

GRAPHIC SCALE IN FEET
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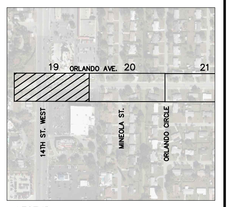
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'



LEGEND

- SIDEWALK/DRIVEWAY RESTORATION
- FULL ROADWAY RESTORATION
- MILLING AND RESURFACING
- REMOVE & REPLACE CURB

NOTES:

1. CONTRACTOR TO FOLLOW RESTRAINED LENGTHS SET IN RESTRAIN LENGTH DETAILS ON SHEET 25 & 26.
2. CONSTRUCTION DEWATERING SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO CHAPTERS 62-621.300 AND 62-620 OF THE FLORIDA ADMINISTRATIVE CODE (FAC).
3. REFER TO DETAIL UG-12 SHEET 24 FOR COUNTY ROADWAY REPAIR REQUIREMENTS
4. EXISTING FORCE MAIN SHALL BE FLUSHED PRIOR TO GROUTING AFTER THE PROPOSED FORCE MAIN HAS BEEN PLACED INTO SERVICE.
5. CONTRACTOR TO COORDINATE WITH PSI REPRESENTATIVES DURING CONSTRUCTION. ALL GROUNDWATER CREATED BY DEWATERING WILL HAVE TO BE TREATED.

*NOTES:
THE ELEVATIONS OF THE UTILITIES MARKED WITH AN ASTERISK (*) HAVE BEEN ASSUMED ON THE BASIS OF TYPICAL ANTICIPATED SOIL COVERAGE. CONTRACTOR SHALL NOT RELY ON THIS INFORMATION FOR CONSTRUCTION, BUT SHALL BE RESPONSIBLE FOR FIELD LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL UTILITIES CROSSING THE PROPOSED FORCE MAIN. CONTRACTOR SHALL INCLUDE IN THE UNIT COST OF THE SUBJECT FORCE MAIN CONSTRUCTION, THE COST OF UTILITY ADJUSTMENTS NECESSARY TO ATTAIN DESIGN MINIMUM SEPARATION FOR UTILITIES CONFLICTING WITH THE CONSTRUCTION OF THE PROPOSED FORCE MAIN. INTERRUPTIONS OF ANY EXISTING UTILITY SERVICES SHALL BE NOTICED TO EFFECTED CUSTOMERS A MINIMUM OF 48 HOURS IN ADVANCE AND SHALL NOT EXCEED 4 HOURS IN DURATION.

WHERE CONCRETE REPAIRS ARE NECESSARY AND EXPANSION JOINTS ARE PRESENT, CONTRACTOR TO REMOVE AND REPLACE CONCRETE UP TO THE NEXT EXPANSION JOINT; OTHERWISE, REPLACE CONCRETE AS NECESSARY.

GROUNDWATER / DEWATERING NOTE:
THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS.

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2018 KIMLEY-HORN AND ASSOCIATES, INC.
655 NORTH FRANKLIN STREET, SUITE 150, TAMPA, FL 33602
PHONE: 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400016
DATE 9/5/2018
SCALE AS SHOWN
DESIGNED BY WWW
DRAWN BY LMB
CHECKED BY WEW

Manatee County FLORIDA

END OF SERVICE LIFE - PACKAGE A:
FM 28A/ PORT MANATEE/ ORLANDO AVE.
MANATEE COUNTY FL

LICENSED PROFESSIONAL
W. WADE WOOD, P.E
FL LICENSE NUMBER 69051
DATE:

PLAN AND PROFILE ORLANDO AVENUE

SHEET NUMBER 19

Approved 2018-H-194-227 Leon Herndon 9/19/2018

CONSTRUCTION PLANS

FOR

END OF SERVICE LIFE FORCE MAIN REPLACEMENT

PACKAGE A: ~~FM 28A/ PORT MANATEE~~ / ORLANDO AVENUE

MANATEE COUNTY, FLORIDA

JULY 2018

MANATEE COUNTY PROJECTS #6089380, #6089880, #6089780

PROJECT TEAM:

OWNER:
MANATEE COUNTY
1022 26TH AVE. E.
BRADENTON, FL 34208
CONTACT: MICHAEL STURM, P.E.
941-708-7450 ext. 7332

ENGINEER:
KIMLEY-HORN AND ASSOCIATES, INC.
655 NORTH FRANKLIN STREET, SUITE 150
TAMPA, FL 33602
CONTACT: W. WADE WOOD, P.E.
813-635-5583

SURVEYOR:
FLORIDA DESIGN CONSULTANTS, INC.,
3030 STARKEY BOULEVARD,
NEW PORT RICHEY, FLORIDA 34655
CONTACT: JARED T. PATENAUDE, PSM
800-532-1047

GEOTECH:
TERRACON CONSULTANTS, INC.
8260 VICO COURT, UNIT B
SARASOTA, FLORIDA 34240
CONTACT: JIMMY M. JACKSON, P.E.
941-256-0510

UTILITY CONTACTS:

FLORIDA POWER & LIGHT
GREG COKER
1253 12TH AVE. EAST
PALMETTO, FL 34221
941-723-4430

FRONTIER COMMUNICATIONS
PATTI REID
1701 RINGLING BLVD.
SARASOTA, FL 34236
941-906-6711

CHARTER COMMUNICATIONS
JIM CRUZAN
5413 S.R. 64 EAST,
BRADENTON, FL 34208
727-329-2846

TRANSMONTAIGNE
STEVE LYNCH
804 N DOCK STREET
PALMETTO, FL 34210
941-722-7727 EXT. 6173

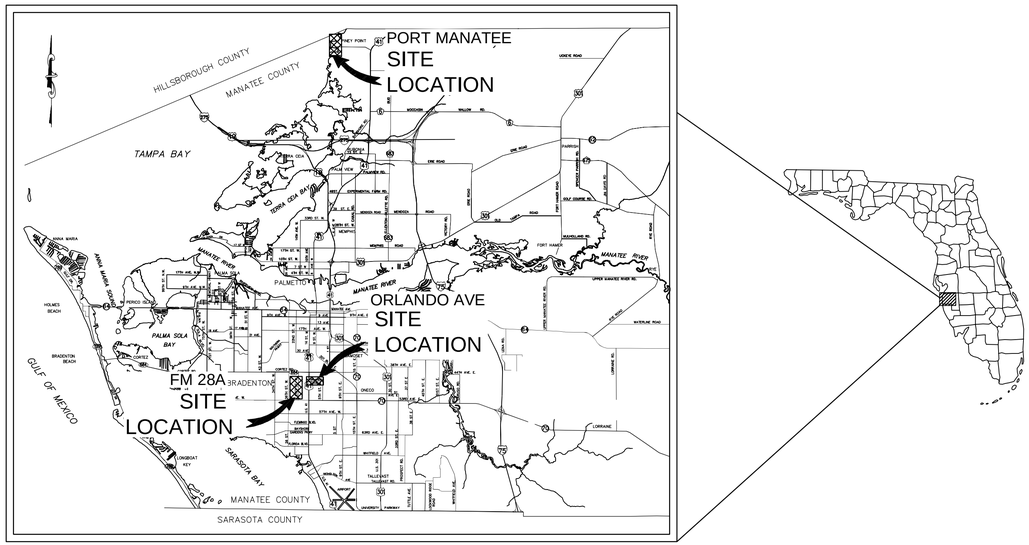
MANATEE COUNTY UTILITY RECORDS
KATHY MCMAHON
4520- 66TH STREET W
BRADENTON, FL 34210
941-792-8811 EXT. 5002

TECO PEOPLES GAS
DANNY SHANAHAN
8261 VICO CT.
SARASOTA, FL 34240
941-342-4006

MANATEE COUNTY PORT AUTHORITY
GEORGE ISIMINGER
300 TAMPA BAY WAY
BRADENTON, FL 34210
941-722-6621

GULFSTREAM NATURAL GAS
FRED DELOACH
4610 BUCKEYE ROAD
PALMETTO, FL 34221
941-723-7108

FIBERNET DIRECT
DANNY HASKETT
9250 W FLAGLER ST.
MIAMI, FL 33174
305-552-2931



PROJECT VICINITY MAP
N.T.S.

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	GENERAL NOTES
3	SURVEY AND SUE NOTES
~~4~~	~~FORCE MAIN 28A KEY SHEET~~
~~5-7~~	~~PLAN AND PROFILE 24TH STREET~~
~~8~~	~~PLAN AND PROFILE 57TH AVENUE~~
~~9~~	~~PLAN AND PROFILE 24TH STREET (N)~~
~~10~~	~~PLAN AND PROFILE 20TH STREET~~
~~11~~	~~PORT MANATEE FORCE MAIN KEY SHEET~~
~~12-13~~	~~PLAN AND PROFILE REGAL CRUISE WAY~~
~~14-17~~	~~PLAN AND PROFILE EASTERN AVENUE~~
18	ORLANDO AVE. FORCE MAIN KEY SHEET
19	PLAN AND PROFILE ORLANDO AVENUE
~~20-23~~	~~PLAN AND PROFILE ORLANDO AVENUE~~
~~24-26~~	~~CONSTRUCTION DETAILS~~

FDOT PERMITTING SET

THE SITE CONSTRUCTION STAKEOUT SHALL BE PERFORMED UNDER THE DIRECTION OF A FLORIDA REGISTERED SURVEYOR. AUTOCAD FILES WILL BE FURNISHED TO AID IN THE SITE CONSTRUCTION STAKEOUT. ANY DISCREPANCIES FOUND BETWEEN AUTOCAD FILES AND SITE CONSTRUCTION PLANS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION FOR CLARIFICATION PRIOR TO THAT STAKEOUT.

PREPARED BY
Kimley»Horn

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No.	REVISIONS	DATE	BY

WADE W. WOOD, P.E.
FLORIDA LICENSE NUMBER
69051
DATE:

DATE
July, 2018
KHA PROJECT NO.
148400016
SHEET NUMBER
1

Approved
2018-H-194-237
Leon Herndon
9/19/2018

GENERAL

1. ALL CONSTRUCTION ACTIVITIES SHALL BE COORDINATED WITH THE PROJECT MANAGEMENT DIVISION. THE PROJECT MANAGER IS: MICHAEL STURM, P.E. AND CAN BE REACHED AT (941) 708-7450 X7332

2. IF THE CONTRACTOR WANTS A SITE VISIT PRIOR TO BIDDING, THESE SHALL BE ARRANGED THROUGH THE COUNTY'S PURCHASING DIVISION.

3. ALL CONSTRUCTION ON THIS PROJECT SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF MANATEE COUNTY UTILITY AND TRANSPORTATION STANDARDS AND/OR FDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" UNLESS OTHERWISE INDICATED ON THE PLANS.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS AND ALL GOVERNING FEDERAL, STATE, AND LOCAL AGENCIES. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS THAT ARE NOT PROVIDED IN THE BID DOCUMENTS, AT NO ADDITIONAL COST TO THE OWNER.

5. THE INFORMATION PROVIDED IN THESE PLANS IS SOLELY TO ASSIST THE CONTRACTOR IN ASSESSING THE NATURE AND EXTENT OF THE CONDITIONS WHICH MAY BE ENCOUNTERED DURING THE COURSE OF WORK. ALL CONTRACTORS ARE DIRECTED, PRIOR TO BIDDING, TO CONDUCT WHATEVER INVESTIGATION THEY MAY DEEM NECESSARY TO ARRIVE AT THEIR OWN CONCLUSIONS REGARDING THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED, AND UPON WHICH THEIR BIDS WILL BE BASED.

6. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS ON THE PLANS AND REVIEW ALL FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION. SHOULD DISCREPANCIES OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO OBTAIN THE ENGINEER'S CLARIFICATION BEFORE COMMENCING WITH CONSTRUCTION.

7. THE CONTRACTOR SHALL NOTIFY SUNSHINE 811 (1-800-432-4770) AT LEAST 2 FULL BUSINESS DAYS PRIOR TO CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL UTILITIES FOR THE POSSIBLE RELOCATION OR THE TEMPORARY MOVEMENT OF ANY EXISTING UTILITIES WITHIN THE RIGHTS-OF-WAY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT EXISTING UTILITIES FROM DAMAGE. EXPLORATORY EXCAVATION MAY BE REQUIRED PRIOR TO CONNECTION TO EXISTING UTILITIES.

8. NO WORK, EXCEPT FOR EMERGENCY TYPE, SHALL BE PERFORMED AFTER 7:00 PM AND BEFORE 7:00 AM. FOR ADDITIONAL PROJECT RESTRAINTS, REFER TO SECTION 01310 OF THE SPECIFICATIONS.

9. THE CONTRACTOR SHALL PROVIDE CERTIFIED RECORD DRAWINGS AS OUTLINED IN THE SPECIFICATIONS. RED-LINE DRAWINGS SHALL BE CURRENT WITH EACH PAY APPLICATION SUBMITTED AND WILL BE CHECKED AS PART OF THE PAY APPLICATION REVIEW PROCESS. PAYMENT WILL NOT BE MADE TO CONTRACTOR WITHOUT APPROVED RED-LINE DRAWINGS. THE MOST CURRENT SET OF RED-LINE DRAWINGS SHALL ALSO BE BROUGHT TO EACH MONTHLY PROGRESS MEETING.

10. THE CONTRACTOR SHALL INCLUDE IN HIS BID:BY-PASS PUMPING FACILITIES, PUMPS, FITTINGS, LABOR, ETC. AS NECESSARY, BASED ON METHOD AND SEQUENCE OF CONSTRUCTION TO COMPLETE ALL WORK WHILE MAINTAINING SEWER SERVICE OPERATIONS AT ALL TIMES.

11. THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER WITH A DETAILED CONSTRUCTION PHASING PLAN BASED ON THE CONNECTION SEQUENCING BELOW. EXISTING FORCE MAIN 28A, PORT MANATEE, AND ORLANDO AVENUE SHALL REMAIN IN SERVICE UNTIL ALL CONNECTIONS TO THE PROPOSED FORCE MAIN ARE CONSTRUCTED.

12. ALL PROPOSED WORK SHALL BE COORDINATED WITH MANATEE COUNTY UTILITIES DEPARTMENT AT LEAST TWO WEEKS IN ADVANCE OF PROPOSED CONSTRUCTION.

13. THE CONTRACTOR SHALL FURNISH SHOP DRAWINGS TO THE ENGINEER FOR REVIEW OF ALL PIPE CONNECTIONS, TRANSITIONS, AND SPECIAL APPURTENANCES PRIOR TO FABRICATION OR DELIVERY TO THE JOB SITE.

14. UNLESS OTHERWISE INDICATED OR APPROVED, ALL BELOW GROUND PVC PIPE SHALL HAVE PUSH-ON OR MECHANICAL JOINTS, AND ALL ABOVE GROUND PVC PIPE SHALL HAVE FLANGED JOINTS. ALL JOINTS SHALL BE FULLY RESTRAINED PER THE DETAILS IN THESE PLANS.

15. SANITARY SEWERS AND FORCEMAINS CROSSING OVER OR UNDER WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18" BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER OR FORCE MAIN PIPE JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN 10' BETWEEN ANY TWO JOINTS. AS AN ALTERNATIVE, THE SEWER OR FORCE MAIN MAY BE PLACED IN A WATERTIGHT CASING PIPE, CONSISTENT WITH F.A.C. RULE 62-555.314.

16. ALL BELOW-GRADE FITTINGS 4-INCHES AND GREATER IN DIAMETER SHALL BE MECHANICAL JOINT DUCTILE IRON WITH PROTECTO 401 LINING FOR THEIR INTERIOR SURFACES AND COAL TAR ENAMEL COATING ON EXTERIOR SURFACES, AS NOTED IN SECTION 02615 OF SPECIFICATIONS.

17. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SECURE PROPERTY FOR STAGING MATERIALS AND EQUIPMENT.

18. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO ACQUIRE, OR ENTER INTO AGREEMENTS, FOR LANDS FOR LAY DOWN AREAS AND STAGING. THE COUNTY WILL COORDINATE AND ADVISE, TO HELP IDENTIFY POSSIBLE PARCELS. IT IS FINALLY THE CONTRACTOR'S RESPONSIBILITY TO SECURE THE NEEDED AREAS, AND THE COUNTY TAKE NO RESPONSIBILITY FOR DELAYS IN THIS REGARD.

19. COORDINATION AND PUBLIC INFORMATION FOR AND WITH AREA RESIDENTS ARE OF THE UTMOST IMPORTANCE. CONTRACTOR WILL INSURE ADHERENCE TO THE COUNTY'S NOISE ORDINANCE, HAZARD AND SAFETY, AND NUISANCE ABATEMENT DIRECTIONS, PLANS, OBJECTIONS AND ORDINANCES. THE ENGINEER WILL HAVE THE FINAL DISCRETION IN THIS REGARD, AS REPRESENTED ONSITE BY THE COUNTY INSPECTOR AND ENGINEER'S STAFF.

SAFETY

20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE FLORIDA TRENCH SAFETY ACT, 90-96, LAWS OF FLORIDA EFFECTIVE OCTOBER 1, 1990 AND THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION EXCAVATION SAFETY STANDARDS, 29 CFR 1926.650, SUBPART P, AS AMENDED. THE CONTRACTOR SHALL INCLUDE IN THE TOTAL BID PRICE ALL COSTS FOR COMPLIANCE WITH THESE REGULATIONS.

21. THE CONTRACTOR SHALL USE SHEET PILING, SHEETING, BRACING, ETC., AS REQUIRED IN ALL EXCAVATION AREAS AND CONFORM TO ALL OSHA REQUIREMENTS.

22. THE CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND UTILITIES, POWER LINES, ETC.

23. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. THIS EXCLUSION DOES NOT ALLEVIATE THE CONTRACTOR FOR PROVIDING A CONTINUOUS SAFE WORKSPACE.

ENVIRONMENTAL

24. WHEN A BENTONITE SPILL OR FRACK-OUT OCCURS OR THERE IS A LOSS OF RETURN INDICATING EXCESSIVE SEEPAGE OR LOSS OF DRILLING FLUID, DRILLING MUST BE STOPPED UNTIL THE LOCATION OF THE SPILL IS IDENTIFIED. UNDER NO CIRCUMSTANCES WILL DRILLING CONTINUE WHEN A SPILL IS APPARENT.

25. ONCE LOCATED, THE BENTONITE SPILL MUST BE ISOLATED AND SEEPAGE INTO ANY NEARBY WATER BODIES WILL BE BLOCKED DEPENDING ON THE DEGREE OF THE SPILL, THE ISOLATED BENTONITE MUST BE REMOVED MANUALLY OR MECHANICALLY AND DISPOSED OF BY APPROPRIATE MEANS OR REUSED.

26. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY STORM WATER, EROSION, AND SEDIMENTATION CONTROL MEASURES IN ACCORDANCE WITH THE FDEP "FLORIDA STORM WATER, EROSION AND SEDIMENTATION CONTROL INSPECTOR'S MANUAL". IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTROL AND PREVENT EROSION AND TRANSPORT OF SEDIMENT TO SURFACE DRAINS AND TO DITCHES DURING CONSTRUCTION.

27. STOCKPILES SHALL BE PROTECTED AT ALL TIMES BY ON-SITE DRAINAGE CONTROLS WHICH PREVENT EROSION OF THE STOCKPILED MATERIAL. CONTROL OF DUST FROM SUCH STOCKPILES IS REQUIRED, DEPENDING UPON THEIR LOCATION AND THE EXPECTED LENGTH OF TIME THE STOCKPILES WILL BE PRESENT. IN NO CASE SHALL ANY STOCKPILED MATERIAL REMAIN AFTER THIRTY (30) CALENDAR DAYS.

28. STORM WATER INLETS IN THE VICINITY OF THE PROJECT SHALL BE PROTECTED BY SEDIMENT TRAPS SUCH AS SECURED HAY BALES, SOD, STONE, ETC., WHICH SHALL BE MAINTAINED AND MODIFIED AS REQUIRED BY CONSTRUCTION PROGRESS, AND WHICH MUST BE APPROVED BY THE ENGINEER BEFORE INSTALLATION. THIS WILL BE MAINTAINED TO PREVENT DEGRADATION OF THE WATERS OF THE COUNTY AND STATE.

29. SEDIMENT BASINS AND TRAPS, PERIMETER BERMS, SEDIMENT BARRIERS, VEGETATIVE BUFFERS, AND OTHER MEASURES INTENDED TO TRAP SEDIMENT AND/OR PREVENT THE TRANSPORT OF SEDIMENT ONTO ADJACENT PROPERTIES, OR INTO EXISTING BODIES OF WATER, MUST BE INSTALLED, CONSTRUCTED, OR IN THE CASE OF VEGETATIVE BUFFERS, PROTECTED FROM DISTURBANCE, AS A FIRST STEP IN THE LAND ALTERATION PROCESS. SUCH SYSTEMS SHALL BE FULLY OPERATIVE BEFORE ANY OTHER DISTURBANCE OF THE SITE BEGINS. EARTHEN STRUCTURES INCLUDING BUT NOT LIMITED TO BERMS, EARTH FILTERS, DAMS OR DIKES SHALL BE STABILIZED AND PROTECTED FROM DRAINAGE DAMAGE OR EROSION WITHIN ONE (1) WEEK OF INSTALLATION.

30. ALL SWALES, DITCHES, AND CHANNELS LEADING FROM THE SITE SHALL BE PROTECTED FROM SILTATION AND EROSION DURING CONSTRUCTION AND BE SODDED WITHIN THREE (3) DAYS OF EXCAVATION.

31. SOIL DISPLACED BY CONSTRUCTION WILL BE REMOVED. EROSION CONTROL SHALL BE IMPLEMENTED IN AREAS WHICH ARE CONSIDERED ENVIRONMENTALLY SENSITIVE. EROSION CONTROL SYSTEMS SHALL BE REQUIRED FOR ALL WORK WITHIN JURISDICTIONAL AREAS. THESE SYSTEMS MAY INCLUDE STAKED HAY BALES, SILT SCREENS, FILTER FABRIC, AND TURBIDITY SCREENS.

32. ALL EROSION AND POLLUTION CONTROL DEVICES SHALL BE CHECKED REGULARLY, ESPECIALLY AFTER EACH RAINFALL AND SHALL BE CLEANED OUT AND/OR REPAIRED AS REQUIRED.

33. THE CONTRACTOR SHALL NOT ENTER UPON OR IN ANY WAY ALTER WETLAND AREAS THAT MAY BE ON OR NEAR THE CONSTRUCTION SITE. ALL WORK IN THE VICINITY OF OPEN WATER AND/OR WETLANDS IS TO BE PERFORMED IN COMPLIANCE WITH THE ENVIRONMENTAL REGULATIONS AND/OR PERMITS FOR THE SITE. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY FINES RESULTING FROM HIS VIOLATION OF ANY REGULATIONS OR PERMIT CONDITIONS.

34. CONTRACTOR SHALL PROVIDE PROTECTIVE MATTING, FUEL CONTAINMENT AND ALL OTHER MATERIALS, EQUIPMENT AND LABOR TO PROTECT THE STAGING AREA DURING CONSTRUCTION.

35. CONTRACTOR SHALL, PRIOR TO BEGINNING CONSTRUCTION, SUBMIT A "FUELING SPILL PREVENTION PLAN" THAT SHALL CLEARLY INDICATE HOW FUEL SPILLS WILL BE PREVENTED WHEN FUELING BOTH WITHIN AND OUTSIDE OF THE STAGING AREA.

36. CONTRACTOR TO COORDINATE WITH PSI REPRESENTATIVES, MICHAEL ROTHENBURG (813.917.0403) AND BEN MARSHALL (813.520.8275) DURING PORT MANATEE AND ORLANDO AVENUE CONSTRUCTION, FOR CONTAMINATED SOIL AND GROUNDWATER.

37. ALL PORT MANATEE CONTAMINATED SOIL AND GROUNDWATER CREATED BY DEWATERING WILL HAVE TO BE TREATED AND IF CONTAMINATED SOIL OR GROUNDWATER IS ENCOUNTERED AT ORLANDO AVENUE, CONTRACTOR TO COORDINATE WITH PSI REPRESENTATIVES.

38. CONTRACTOR SHALL BE AWARE THAT HIGH LEVELS OF HYDROGEN SULFIDE WERE FOUND AT THE NORTH END OF THE PORT MANATEE PROJECT LIMITS.

RIGHT-OF-WAY

39. ALL CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO WITHIN THE MANATEE COUNTY RIGHT-OF-WAY, OTHER PUBLIC RIGHT-OF-WAYS OR EASEMENTS SHOWN ON THE DRAWINGS.

40. THE CONTRACTOR SHALL EMPLOY A LAND SURVEYOR REGISTERED IN THE STATE OF FLORIDA TO REFERENCE AND RESTORE PROPERTY CORNER MONUMENTS, PINS, AND LANDMARKS THAT MAY BE DISTURBED BY CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

41. THE CONTRACTOR, PRIOR TO CONSTRUCTION AND RESTRICTING ANY TRAFFIC, MUST OBTAIN ANY REQUIRED RIGHTS-OF-WAY USE PERMITS AND A TRAFFIC CONTROL PLAN. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM OTHER GOVERNMENTAL AGENCIES HAVING RELEVANT JURISDICTION. ALL MAINTENANCE AND PROTECTION OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE CURRENT FLORIDA DEPARTMENT OF TRANSPORTATION "MANUAL OF TRAFFIC CONTROL AND SAFE PRACTICES". A TRAFFIC CONTROL PLAN SHALL BE SUPPLIED BY THE CONTRACTOR AT THE PRE-CONSTRUCTION MEETING, PER SPECIFICATIONS 01570.

42. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL DAMAGED STORM WATER STRUCTURES, PIPING, ENTRANCE PIPE AND HEADWALLS WHETHER SHOWN ON THE PLANS OR NOT. THE HEADWALLS SHALL BE REPLACED IN ACCORDANCE WITH F.D.O.T. STANDARDS, OR THE APPLICABLE JURISDICTION.

43. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH IN THE FIELD THE RIGHT-OF-WAY LINES, BASE LINES, BENCH MARKS (ELEV.), CENTER LINES, AND STATIONING AS REQUIRED TO CONSTRUCT THIS PROJECT.

44. THE CONTRACTOR SHALL COORDINATE THE CUTTING OF DRIVEWAYS WITH THE PROPERTY OWNER PRIOR. ALL DRIVEWAYS MUST BE IN PASSABLE CONDITION AT THE END OF THE WORK DAY AND FULLY RESTORED.

45. A RIGHT OF ENTRY AGREEMENT SHALL BE OBTAINED BY THE CONSTRUCTION MANAGER FROM THE PROPERTY OWNER BEFORE ANY DRIVEWAY CONSTRUCTION WORK IS DONE OUTSIDE OF THE RIGHT-OF-WAY OR EASEMENT.

UTILITIES

46. LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA AND WHICH HAVE NOT BEEN LOCATED OR IDENTIFIED, MAY NOT BE IN THE EXACT LOCATION SHOWN OR RELOCATED SINCE THE PREPARATION OF THESE PLANS. THE CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS AND DIMENSIONS OF ALL EXISTING UTILITIES STRUCTURES AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE PLANS) THAT MAY EFFECT HIS WORK. ALL EXISTING UTILITIES TO BE EXTENDED, CROSSED OR CONNECTION POINTS SHALL BE EXPOSED PRIOR TO CONSTRUCTION TO VERIFY LOCATION AND ELEVATION. ANY DISCREPANCIES OR CONFLICTS FOUND SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION FOR RESOLUTION.

47. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, WATER AND SEWER LINES, STORM DRAINS, UTILITIES, DRIVEWAYS, SIDEWALKS, SIGNS, MAIL BOXES, FENCES, TREES, LANDSCAPING, AND ANY OTHER IMPROVEMENT OR FACILITY IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL REPAIR AND/OR REPLACE ANY DAMAGED ITEM DUE TO HIS CONSTRUCTION ACTIVITIES TO EQUAL OR BETTER THAN PRE-CONSTRUCTION CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.

48. THE CONTRACTOR SHALL USE APPROPRIATE TECHNIQUES, AS APPROVED, RECOMMENDED OR OFFERED BY FLORIDA POWER AND LIGHT TO PREVENT UNDERMINING OF POWER POLES DURING CONSTRUCTION. IF HOLDING OF POWER POLES IS RECOMMENDED OR REQUIRED BY THE UTILITY, THE CONTRACTOR SHALL COORDINATE THIS ACTIVITY WITH THE UTILITY AND BEAR ALL RELATED COSTS.

49. ANY TEMPORARY SHUTDOWNS FOR MODIFICATIONS OF EXISTING UTILITY SYSTEMS THAT MUST REMAIN IN SERVICE DURING CONSTRUCTIONS SHALL BE KEPT TO A MINIMUM AND SHALL BE COORDINATED WITH AND APPROVED BY THE MANATEE COUNTY UTILITY OPERATIONS DEPARTMENT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT IS NOTED THAT TEMPORARY SHUTDOWNS MAY BE RESTRICTED TO CERTAIN HOURS AT ANY TIME OF THE DAY OR NIGHT AND WILL BE COMPLETED AT NO ADDITIONAL COST TO THE OWNER.

50. FOR WORK BEING DONE ON EXISTING SANITARY SEWER LINES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE FLOW OF ALL SEWAGE DURING CONSTRUCTION, WHICH MAY REQUIRE BY-PASS PUMPING AND/OR PUMPER TRUCKS. THE CONTRACTOR SHALL SUBMIT A DETAILED BY-PASS PUMPING PLAN PER SECTION 02720.

51. THE ELEVATIONS OF THE UTILITY SERVICES AND LATERALS HAVE BEEN ASSUMED ON THE BASIS OF TYPICAL ANTICIPATED SOIL COVERAGE. CONTRACTOR SHALL NOT RELY ON THIS INFORMATION FOR CONSTRUCTION, BUT SHALL BE RESPONSIBLE FOR FIELD LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL UTILITIES CROSSING THE PROPOSED FORCE MAIN. CONTRACTOR SHALL INCLUDE IN THE UNIT COST OF THE SUBJECT FORCE MAIN CONSTRUCTION, THE COST OF UTILITY ADJUSTMENTS NECESSARY TO ATTAIN DESIGN MINIMUM SEPARATION FOR UTILITIES CONFLICTING WITH THE CONSTRUCTION OF THE PROPOSED FORCE MAIN. INTERRUPTIONS OF ANY EXISTING UTILITY SERVICES SHALL BE NOTICED TO EFFECTED CUSTOMERS A MINIMUM OF 48 HOURS IN ADVANCE AND SHALL NOT EXCEED 4 HOURS IN DURATION.

RESTORATION

52. ALL RESTORATION WORK PERFORMED THROUGHOUT THE PROJECT SHALL CONFORM TO EXISTING LINES AND GRADES UNLESS SHOWN OTHERWISE.

53. ALL DISTURBED GRASSED AREAS SHALL BE SODDED UNLESS OTHERWISE INDICATED. THE TYPE OF SOD USED TO REPLACE OWNER MAINTAINED AREAS IN RIGHT-OF-WAY SHALL BE COORDINATED WITH THE PROPERTY OWNER.

54. ALL CONCRETE THRUST BLOCKS INSTALLED FOR TESTING PURPOSES AND NOT REQUIRED FOR THE OPERATION OF THE PIPELINE SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR, PRIOR TO FINAL ACCEPTANCE, AT NO ADDITIONAL COST TO THE OWNER.

55. ASPHALT DRIVES THAT ARE CUT SHALL BE RESTORED PER SECTION 02513.

56. CONCRETE DRIVEWAYS OR SIDEWALKS THAT ARE CUT SHALL BE RESTORED TO MATCH EXISTING ACCORDING TO THE CURRENT EDITIONS OF THE F.D.O.T. SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN, SECTION 522, AND SECTION 310 OF THE F.D.O.T. DESIGN STANDARDS.

57. WHENEVER A PERMANENT ROADWAY SURFACE IS NOT REPLACED IMMEDIATELY AFTER BACKFILLING AND COMPACTION OF THE NEWLY INSTALLED PIPE LINE IN AREAS WHERE TRAFFIC MUST PASS, THE CONTRACTOR SHALL INSTALL A TEMPORARY SURFACE CONSISTING OF NINE INCHES OF COMPACTED LIME ROCK BASE AND A COAT OF ASPHALT EMULSION. PERMANENT ROADWAY REPAIR SHALL BE PERFORMED A MAXIMUM OF TWENTY-ONE CALENDAR DAYS AFTER THE INITIAL OPEN CUTTING.

58. RESTORATION OF CURBS, DRIVEWAYS, SIDEWALKS, AND PLACEMENT OF SOD SHALL BE COMPLETED WITHIN FORTY-FIVE CALENDAR DAYS OF INITIAL DISTURBANCE, OR TWENTY-ONE CALENDAR DAYS OF SUBSTANTIAL COMPLETION, WHICHEVER OCCURS FIRST.

59. ALL EXISTING FENCES DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED AND REINSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER UNLESS SHOWN TO BE REMOVED ON CONSTRUCTION PLANS.

60. WHERE CONCRETE REPAIRS ARE NECESSARY AND EXPANSION OR CONTRACTION JOINTS ARE PRESENT, CONTRACTOR SHALL REMOVE AND REPLACE CONCRETE UP TO THE NEXT EXPANSION OR CONTRACTION JOINT.

CONSTRUCTION

61. THE EXHAUST SYSTEM OF ALL GASOLINE AND DIESEL ENGINES SHALL BE EQUIPPED WITH MUFFLERS THAT MEET THE EQUIPMENT MANUFACTURER'S REQUIREMENTS FOR NOISE SUPPRESSION. THE CONTRACTOR SHALL INSTALL NOISE ABATEMENT BAFFLES POSITIONED TO BREAK LINE-OF-SITE FROM THE NOISE SOURCE TO AFFECTED RESIDENCES, AS APPROVED BY THE ENGINEER.

62. NO MATERIAL SHALL BE STOCKPILED IN ROADWAYS. ALL DIRT AND DEBRIS SHALL BE REMOVED FROM THE JOB SITE DAILY. ROADS SHALL BE SWEPT DAILY AS PART OF DAILY CLEAN UP.

63. THE CONTRACTOR IS TO CONTROL ALL FUGITIVE DUST ORIGINATING ON THIS PROJECT BY WATERING OR OTHER METHODS AS REQUIRED.

64. INGRESS AND EGRESS TO ALL THE PROPERTIES IN THE CONSTRUCTION AREA SHALL BE MAINTAINED AT ALL TIMES.

65. PRIOR APPROVAL WILL BE REQUIRED FOR REMOVAL OR TRIMMING OF ANY TREE WITHIN THE CONSTRUCTION AREA.

66. THE CONTRACTOR SHALL PROVIDE ALL DEWATERING EQUIPMENT NECESSARY TO KEEP ALL EXCAVATIONS DRY. DEWATERING IS REQUIRED TO 18" BELOW TRENCH BOTTOM.

67. ALL PIPING AND FITTINGS USED ON THIS PROJECT SHALL BE AS NOTED ON THE PLANS AND IN THE CONTRACT DOCUMENT AND SHALL BE INSTALLED TO THE LINES AND GRADES SHOWN ON THE PLANS AND PROFILES.

68. ALL PIPE SHALL BE COLOR CODED TO CONFORM TO MANATEE COUNTY STANDARDS.

69. ALL FITTINGS FOR PRESSURE CLASS-RATED PIPE SHALL BE RESTRAINED DUCTILE IRON. RESTRAINED LENGTHS OF PIPE SHALL ADHERE TO THE REQUIREMENTS AS SHOWN ON THE DETAIL SHEETS.

70. WHERE IT IS NECESSARY TO DEFLECT PIPE EITHER HORIZONTALLY OR VERTICALLY, PIPE DEFLECTION SHALL NOT EXCEED 75% OF THE MANUFACTURER'S MAXIMUM ALLOWABLE RECOMMENDED DEFLECTION.

71. ALL ROCKS OR STONES LARGER THAN SIX INCH DIAMETER SHALL BE REMOVED FROM THE BACKFILL MATERIAL. BACKFILL MATERIAL PLACED WITHIN ONE FOOT OF PIPING AND APPURTENANCES SHALL NOT CONTAIN ANY STONES LARGER THAN TWO INCH DIAMETER.

72. ONLY MANATEE COUNTY UTILITY OPERATIONS STAFF ARE AUTHORIZED TO OPERATE VALVES AND PUMP STATIONS ON COUNTY OWNED AND MAINTAINED UTILITY SYSTEMS.

73. THE CONTRACTOR, PRIOR TO ANY TEMPORARY WATER SHUT-OFFS DURING WATER MAIN TIE-IN, ETC., SHALL NOTIFY THE AFFECTED RESIDENTS BY POSTING INFORMATIONAL SIGNS IN THE NEIGHBORHOOD AT LEAST TWO DAYS (48 HRS) PRIOR TO THE WATER SHUT-OFF. REFERENCE SECTION 01580, PARAGRAPH 1.03 OF THE SPECIFICATIONS. WHEN FEASIBLE, "DOOR HANGERS" SHALL BE DELIVERED TO AFFECTED RESIDENCES AT LEAST TWO DAYS (48 HRS) PRIOR TO WATER SHUT-OFF. FOR LARGE PROJECTS WITH HUNDREDS OF HOMES AFFECTED, THE CONTRACTOR SHALL ALSO MAKE EXTENSIVE USE OF THE MEDIA AND SHALL HAVE PRIOR CONTACT WITH HOMEOWNER'S ASSOCIATIONS AND THE RESPECTIVE CITY'S. WRITTEN NOTIFICATIONS SHALL ALSO BE FAXED TO THE TAMPA TRIBUNE, BRADENTON HERALD, AMI SUN, ISLANDER, SARASOTA HERALD TRIBUNE, WBRD RADIO, EMERGENCY COMMUNITY CENTERS, INSPECTIONS, WATER TREATMENT PLANT, WATER MANAGER, HELPLINE, CUSTOMER SERVICE, AND THE MANATEE COUNTY UTILITY OPERATIONS DEPARTMENT.

74. ALL TEST POINT PIPING SHALL BE CUT LOOSE FROM THE CORPORATION STOP AND COMPLETELY REMOVED AND DISPOSED OF BY THE CONTRACTOR PRIOR TO FINAL ACCEPTANCE. A CORPORATION STOP PLUG SHALL BE INSTALLED AND THE CORPORATION STOP SHALL REMAIN IN PLACE.

75. ALL EXISTING MAINS THAT ARE BEING REPLACED SHALL BE ABANDONED IN PLACE UPON ACCEPTANCE AND ACTIVATION OF THE NEW MAINS. ABANDONED MAINS SHALL BE CUT AND CAPPED. REFER TO SECTION 02064 OF THE SPECIFICATIONS FOR CUT AND CAPPING ABANDONED PIPE.

76. FIELD CONDITIONS MAY NECESSITATE MINOR ALIGNMENT AND GRADE DEVIATION OF THE PROPOSED UTILITIES TO AVOID OBSTACLES, AS ORDERED BY THE ENGINEER.

77. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION FROM THE MANATEE COUNTY UTILITIES DEPARTMENT (MCUD) OFFICE OF INDUSTRIAL COMPLIANCE PRIOR TO DEWATERING. COMPLETION OF A CONSTRUCTION DEWATERING AUTHORIZATION TO DISCHARGE APPLICATION IS REQUIRED. FILL OUT FORM AS COMPLETELY AS POSSIBLE AS MISSING INFORMATION DELAYS THE APPROVAL PROCESS.

78. THE MCUD OFFICE OF INDUSTRIAL COMPLIANCE WILL DETERMINE WHETHER A LETTER OF APPROVAL, A DISCHARGE AUTHORIZATION, OR A DISCHARGE PERMIT IS REQUIRED.

79. FOR SITES SUSPECTED OF CONTAMINATED GROUNDWATER MANATEE COUNTY WILL REQUIRE AN APPLICANT TO DEMONSTRATE THAT THE DISCHARGE MEETS THE MANATEE COUNTY SEWER USE ORDINANCE.

80. IF ANY RECLAIMED OR WATER MAINS INCLUDING SERVICE LINES ARE DAMAGED DURING CONSTRUCTION, THEY SHALL BE REPLACED FROM THE VALVE TO THE OTHER POINT OF CONNECTION OUTSIDE OF THE ROADWAY PER MANATEE COUNTY'S STANDARDS. SERVICES SHALL BE REPLACED FROM THE COLD STOP TO THE METER.

TRAFFIC CONTROL NOTES

81. TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH F.D.O.T. DESIGN STANDARDS INDICES NO. 600, 603, 605, 611, 612, 613, 616, AND 660 DEPENDING ON THE OPERATION BEING PERFORMED.
FOR ALL TWO-LANE WORK, TWO-WAY, WORK WITHIN TRAVEL LANE UTILIZE INDEX 603.
FOR ALL TWO-LANE WORK, TWO-WAY, WORK NEAR INTERSECTION UTILIZE INDEX 605.
FOR ALL MULTILANE WORK OUTSIDE SHOULDER UTILIZE INDEX NO. 611.
FOR ALL MULTILANE WORK ON SHOULDER UTILIZE INDEX NO. 612.
FOR ALL MULTILANE WORK WITHIN TRAVEL WAY MEDIAN OR OUTSIDE LANE UTILIZE INDEX NO. 613.
FOR ALL MULTILANE WORK NEAR INTERSECTION MEDIAN OR OUTSIDE LANE UTILIZE INDEX NO. 616.
FOR PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALK, UTILIZE FDOT INDEX NO. 660.

82. CONTRACTOR TO COORDINATE WITH ED HERNDON (941) 708-4436 AT FDOT FOR ALL WORK DONE ON A STATE FACILITY.

83. TO AVOID DISRUPTION DUE TO INCLEMENT WEATHER, THE CONTRACTOR SHOULD PERFORM ANY MILLING AND PAVING OPERATIONS DURING THE SAME WORK PERIOD.

84. ALL EXISTING PAVEMENT MARKINGS OUTSIDE THE CONSTRUCTION LIMITS THAT HAVE BEEN ALTERED BECAUSE OF CONSTRUCTION OPERATIONS SHALL BE REPLACED UPON THE COMPLETION OF THE PROJECT AT THE CONTRACTORS EXPENSE.

85. LANE CLOSURES SHALL OCCUR BETWEEN 9:00 P.M. AND 5:00 A.M., UNLESS LANE CLOSURE CALCULATIONS ARE PROVIDED AND APPROVED OR APPROVAL IS GRANTED BY THE DISTRICT PERMIT ENGINEER.

THE CONTRACTOR SHALL SCHEDULE WORK OPERATIONS SO THAT ALL LANES CAN BE RE-OPENED TO TRAFFIC WITHIN A PERIOD OF 24 HOURS IN CASE OF AN EMERGENCY.

86. PEDESTRIANS, BICYCLES, AND WHEELCHAIRS:
AT THE END OF EACH WORKDAY OR WHENEVER THE WORK ZONE BECOMES INACTIVE, ANY DROP-OFF ADJACENT TO A SIDEWALK SHALL BE BACKFILLED AT A SLOPE NOT TO EXCEED 1:4, OR SHALL BE PROTECTED IN ACCORDANCE WITH STANDARD INDEX 600.

87. PEDESTRIAN AND WHEELCHAIR TRAFFIC SHALL BE ACCOMMODATED UTILIZING STANDARD INDEX 660.

88. ONE PORTABLE VARIABLE MESSAGE SIGN SHALL BE USED IN ADVANCE OF EACH LANE CLOSURE. THE FOLLOWING ARE SUGGESTED MESSAGES TO USE IN THE APPROPRIATE SITUATIONS:

MESSAGE 1

"RIGHT"	OR	"CENTER"	OR	"LEFT"
"LANE"		"LANE"		"LANE"
"CLOSED"		"CLOSED"		"CLOSED"

89. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMMEDIATE REMOVAL OF STORMWATER FROM ROADWAYS UTILIZED FOR TRAFFIC CONTROL IN A MANNER APPROVED BY THE ENGINEER.

90. AT THE END OF EACH WORKING DAY'S ACTIVITY, TEMPORARY PAVEMENT MARKINGS AND TEMPORARY RPM'S SHALL BE INSTALLED PRIOR TO OPENING THE LANES UP FOR TRAFFIC.

91. ALL PAVEMENT MARKINGS, SIGNS, MARKERS, CHANNELIZATION REQUIRED TO PHASE WORK OR SHIFT TRAFFIC, SHALL UTILIZE INDICES FOR PLACEMENT.

92. THE CONTRACTOR SHALL RESTRICT THE OPERATIONS SO THAT THE FIRST LIFT OF ASPHALT IS PLACED ON THE SAME DAY THAT THE LANES ARE MILLED, BEFORE OPENING THE LANES TO TRAFFIC. INSTALL TEMPORARY PAVEMENT MARKINGS AFTER THE FIRST LIFT AND PRIOR TO OPENING.

93. MILLING AND RESURFACING SHALL BE ACCOMPLISHED DURING THE OFF-PEAK HOURS.

94. THE CONTRACTOR IS RESPONSIBLE TO RETIME THE TRAFFIC SIGNALS WITHIN THE PROJECT LIMITS (INCLUDING LIMITS OF WORK ZONE TRAFFIC CONTROL) THAT ARE POTENTIALLY AFFECTED DURING VARIOUS PHASES OF CONSTRUCTION. COORDINATE ALL SIGNAL RETIME EFFORTS MUKUNDA GOPALAKRISHNA, P.E., PTOE, COUNTY TRAFFIC ENGINEER, AT 941-749-3500, EXT. 7813.

95. CONTRACTOR TO MAINTAIN VEHICLE DETECTION IN OPERATION FOR LANES THAT WILL REMAIN OPEN. CONTRACTOR TO COORDINATE ALL VEHICLE DETECTION ISSUES WITH CLARKE DAVIS OF MANATEE COUNTY AT 941-708-7450, EXT. 7272 OR CLARKE.DAVIS@MYMANATEE.ORG

96. MAINTENANCE OF TRAFFIC AND ANY SIGNAL RETIMING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

97. ANY SIGNAL RETIMING REQUIRED FOR THE INTERSECTIONS IMPACTED BY THE PROJECT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. SIGNAL TIMING MODIFICATIONS TO BE SUBMITTED TO MANATEE COUNTY TRAFFIC DESIGN, ATTENTION MR. MUKUNDA GOPALAKRISHNA FOR REVIEW AND APPROVAL AT LEAST 15 WORKING DAYS BEFORE PROPOSED CHANGES. THIS DOES NOT GOVERN EMERGENCY SITUATIONS, PENDING THE APPROVAL OF THE ENGINEER.

98. A DETAILED MAINTENANCE OF TRAFFIC PLANS ARE TO BE SUBMITTED TO MANATEE COUNTY AND THE ENGINEER, BY THE CONTRACTOR, FOR REVIEW AND APPROVAL A MINIMUM OF 21 WORKING DAYS PRIOR TO PROPOSED IMPLEMENTATION.

ABBREVIATIONS

RJ – RESTRAINED JOINT
R/W – RIGHT-OF-WAY
HDD – HORIZONTAL DIRECTIONAL DRILL
RCP – REINFORCED CONCRETE PIPE
ARV – AIR RELEASE VALVE
HDPE – HIGH DENSITY POLYETHYLENE
PVC – POLYVINYL CHLORIDE
NG – NATURAL GROUND
ST – STORM DRAIN
EX. – EXISTING
BT – BURIED TELEPHONE
UC – UNDERGROUND CONDUIT
DBC – DIRECT BURIED CABLE
FOC – FIBER OPTIC CABLE
SS – SANITARY SEWER
FM – FORCE MAIN
WM – WATER MAIN
RW – RECLAIM WATER MAIN
ECP – ELLIPTICAL CONCRETE PIPE

KIMLEY HORN LEGEND

EX. FORCEMAIN	FM
PROPOSED FORCEMAIN/ WATERMAIN	
EX. WATERMAIN	WM
ABANDONED WATERMAIN	WM-AB
EX. SANITARY SEWER	SS
EX. STORM	
EX. BURIED TELEPHONE/FIBER	BT
EX. FIBER OPTIC CABLE	FOC
EX. DIRECT BURIED CABLE	DBC
EX. UNDERGROUND CONDUIT	UC
EX. OIL	OIL
EX. BURIED ELECTRIC	BE
EX. GAS	GAS
EX. OVERHEAD UTILITIES	OHU
EX. BURIED TV	BTV
PROPOSED FULL ROADWAY RESTORATION	
PROPOSED SIDEWALK/ DRIVEWAY REPAIR	
PROPOSED CURB REPAIR	
PROPOSED MILLING AND RESURFACING	
EX. CONCRETE DRIVEWAY	
EX. ASPHALT DRIVEWAY	
EX. BRICK DRIVEWAY	
EX. SHELL DRIVEWAY	
EX. INFILTRATION TRENCH	
EX. GRAVEL/STONE	

No.	REVISIONS	DATE	BY

Kimley»Horn

655 NORTH FRANKLIN STREET, SUITE 150, TAMPA, FL 33602
PHONE: 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400016
DATE 6/14/2018
SCALE AS SHOWN
DESIGNED BY WWW
DRAWN BY LMB
CHECKED BY WEW

Manatee County FLORIDA

END OF SERVICE LIFE - PACKAGE A:
FM 28A/ PORT MANATEE/ ORLANDO AVE.

MANATEE COUNTY FL

LICENSED PROFESSIONAL
W. WADE WOOD, P.E
FL LICENSE NUMBER 69051
DATE:

GENERAL NOTES

SHEET NUMBER 2

FM 28A TEST HOLE DATA
(OMNI COMMUNICATIONS REPORT, JOB #33-17-062)

TEST HOLE	UTILITY	FIELD MARKING	GROUND EL (FEET)	TOP OF PIPE (FEET)	NOTES PER OMNI REPORT
TH-01	4" PVC MULTI-DUCT COMMUNICATION	FOUND HUB AT GROUND LEVEL, NO LATH	18.49	13.99	ONE CONDUIT WAS BROKEN

NOTE: SUBSURFACE UTILITY ENGINEERING DATA PROVIDED BY OMNI COMMUNICATIONS, LLC, DATED DECEMBER 14, 2017.

PORT MANATEE TEST HOLE DATA
(OMNI COMMUNICATIONS REPORT, JOB #33-17-027 AND #33-17-061)

TEST HOLE	UTILITY	FIELD MARKING	GROUND EL (FEET)	TOP OF PIPE (FEET)	NOTES PER OMNI REPORT
TH-01	30" OIL LINE	FOUND NAIL AND DISK MARKED TH-1	8.50	N/A	NO UTILITY DETECTED
TH-02	16" STEEL OIL LINE	FOUND NAIL AND DISK MARKED TH-2 C-3.10	8.71	5.61	UTILITY TYPE UNABLE TO BE VERIFIED, POSSIBLE OIL LINE
TH-03	6" STEEL UNKNOWN UTILITY	FOUND NAIL AND DISK MARKED TH-3 C-3.49	8.43	4.94	UTILITY TYPE UNABLE TO BE VERIFIED, RUSTY POOR CONDITION
TH-04	5' CONC CAP ON OIL LINE	FOUND NAIL AND DISK MARKED TH-4	8.49	1.09	FOUND TOP OF CONC CAP ON OIL LINE
TH-05	14" STEEL OIL LINE	FOUND HUB AT GROUND LEVEL W/ LATH MARKED TH-5 14" STEEL UNK C-5.54	6.70	1.16	UTILITY TYPE UNABLE TO BE VERIFIED, POSSIBLE OIL LINE
TH-06	OIL/GAS LINE	FOUND NAIL AND DISK MARKED TH-6	8.63	N/A	VAC AND PROBED SOUTH SIDE OF 16" UNK. POSSIBLE OIL AND GAS. NO LINES FOUND BESIDE OR BELOW.
TH-07	OIL/GAS LINE	FOUND NAIL AND DISK MARKED TH-7	8.71	N/A	VAC AND PROBED NORTH SIDE OF 16" UNK. POSSIBLE OIL AND GAS. NO OTHER LINES BESIDE OR BELOW.
TH-08	18" STEEL OIL LINE	FOUND NAIL WITH PINK FLAGGING AND OMNI DESCRIPTION PINK PAINT	8.40	5.60	FOUND 18" STEEL OIL LINE
TH-09	STEEL OIL LINE (SIZE UNKNOWN)	FOUND NAIL WITH PINK FLAGGING AND OMNI DESCRIPTION PINK PAINT	8.39	0.13	NOT ABLE TO VERIFY SIZE OF STEEL OIL LINE DUE TO WATER AND CAVE INS

NOTE: SUBSURFACE UTILITY ENGINEERING DATA PROVIDED BY OMNI COMMUNICATIONS, LLC, DATED DECEMBER 18, 2017.

ORLANDO AVE. TEST HOLE DATA
(OMNI COMMUNICATIONS REPORT, JOB #33-17-028 AND #33-17-063)

TEST HOLE	UTILITY	FIELD MARKING	GROUND EL (FEET)	TOP OF PIPE (FEET)	NOTES PER OMNI REPORT
TH-01	2" PE GAS LINE	X-CUT W/ "C-1.55" MARKED ON CONC SWK FOR LOCATION	15.70	14.15	FOUND 2" PE GAS LINE
TH-02	4" PVC/STEEL WATERLINE	FOUND NAIL IN ASPH MARKED TH2, NO CUT POSTED	14.64	12.72	FOUND 4" PVC TO METAL WATERLINE
TH-03	6" ACP WATERLINE	FOUND HUB AT GROUND LEVEL W/ LATH MARKED "BH TH3 6" ACP WL C-1.54"	16.10	14.57	FOUND 6" ACP WATERLINE
TH-04	1" PE GAS LINE	FOUND HUB AT GROUND LEVEL W/ LATH MARKED "BH TH4 1" PE GAS C-1.20"	16.10	14.90	FOUND 1" PE GAS HAS YELLOW TRACE WIRE WITH IT
TH-05	2" PE GAS LINE	FOUND HUB AT GROUND LEVEL W/ LATH MARKED "BH TH5 2" PE GAS C-1.85"	15.70	13.85	FOUND 2" PE GAS
TH-06	2" PE GAS LINE	FOUND HUB AT GROUND LEVEL W/ LATH MARKED "BH TH6 2" PE GAS C-1.83"	15.60	13.77	FOUND 2" PE GAS LINE
TH-07	8" PVC WATERLINE	FOUND HUB AT GROUND LEVEL MARKED "BH TH7 8" WL PVC C-3.60"	16.00	12.40	FOUND 8" PVC WATERLINE
TH-08	WATERLINE	NOT FOUND OR MARKED IN FIELD BY OMNI	15.70	N/A	VAC AND PROBED BOTH SIDES OF WM 1-CALL MARKS (NOT FOUND). GPR NOT DETECTING - BAD GRID CONDITIONS. SHELL, HARD LAYERS. WILL TAKE VAC SOMETIME TO LOCATE.
TH-09	10" DIP FORCEMAIN	FOUND HUB AT GROUND LEVEL W/ LATH MARKED "BH TH9 10" DIP FM C-4.67'"	15.60	10.93	FOUND 10" DIP FORCEMAIN
TH-10	2" PE GAS LINE	FOUND HUB AT GROUND LEVEL W/ LATH MARKED "BH TH10 2" PE GAS C-3.53"	15.60	12.07	FOUND 2" PE GAS
TH-11	10" DIP FORCEMAIN	FOUND NAIL IN ASPHALT	15.98	12.06	NO NOTES
TH-12	1-1/2" PE FIBER OPTIC CABLE	FOUND NAIL IN ASPHALT	15.87	13.17	NO NOTES
TH-13	10" DIP FORCEMAIN	FOUND NAIL IN ASPHALT	15.06	12.58	NO NOTES
TH-14	4" PVC WATERLINE	FOUND HUB AT GROUND LEVEL	15.74	14.20	NO NOTES
TH-15	WATERLINE	FOUND HUB AT GROUND LEVEL WITH LATH THAT INDICATED VAC TO 5' AND LANCED TO 10'. NO UTILITY FOUND.	16.31	N/A	NO DETECTION ON WATER LINE 810-GPR RD. CALL MARK LEONARD. 1 CALL MARKS NOT FOUND

NOTE: SUBSURFACE UTILITY ENGINEERING DATA PROVIDED BY OMNI COMMUNICATIONS, LLC, DATED DECEMBER 13, 2017.

SURVEY NOTES

FM 28A SITE CONTROL

DESIGNATION	NORTHING	EASTING	ELEVATION (FEET)
BM-1	1129721.35	466405.00	18.14
BM-2	1129715.77	467401.42	18.33

THE FOLLOWING NGS VERTICAL CONTROL MONUMENT WAS RECOVERED AND UTILIZED FOR THE ELEVATIONS SHOWN HEREIN: "COB 1049" NAVD 1988 ELEVATION 23.94' A VALUE OF (+0.98') SHOULD BE APPLIED TO ALL ELEVATIONS FOR A CONVERSION TO NGVD 1929.

PORT MANATEE FM SITE CONTROL

DESIGNATION	NORTHING	EASTING	ELEVATION (FEET)
BM-1	1199967.34	475749.05	8.83
BM-2	1200449.83	475838.48	7.11

THE FOLLOWING NGS VERTICAL CONTROL MONUMENT WAS RECOVERED AND UTILIZED FOR THE ELEVATIONS SHOWN HEREIN: "COB 1049" NAVD 1988 ELEVATION 23.94' A VALUE OF (+0.98') SHOULD BE APPLIED TO ALL ELEVATIONS FOR A CONVERSION TO NGVD 1929.

ORLANDO AVE. FM SITE CONTROL

DESIGNATION	NORTHING	EASTING	ELEVATION (FEET)
BM-1	1136195.59	470368.61	16.35
BM-2	1136241.69	471733.45	16.13
BM-3	1136940.38	471979.23	15.63
BM-4	1136940.39	471979.21	15.62
BM-5	1137137.43	471941.22	17.12

THE FOLLOWING NGS VERTICAL CONTROL MONUMENT WAS RECOVERED AND UTILIZED FOR THE ELEVATIONS SHOWN HEREIN: "COB 1049" NAVD 1988 ELEVATION 23.94' A VALUE OF (+0.98') SHOULD BE APPLIED TO ALL ELEVATIONS FOR A CONVERSION TO NGVD 1929.

SURVEY LEGEND

EXISTING

BM BENCH MARK
CM CONCRETE MONUMENT
IP IRON PIPE
IR IRON ROD
HUB HUB
N&D NAIL & DISK
45.2258 ELEVATION
PARCEL ID NO.
PARCEL ID NO.
LOT NO.
GW GUY WIRE
PP POWER POLE
LP LIGHT POLE
MB MAIL BOX
SN SIGN
REF REFLECTOR
SPRK SPRINKLER
GM GAS MARKER
BFP BACKFLOW PREVENTER
BO BLOW OFF VALVE
FH FIRE HYDRANT
WV WATER VALVE
ARV AIR RELEASE VALVE
WM WATER METER
SMH SANITARY SEWER MANHOLE
CO SANITARY SEWER CLEAN OUT
SB# SOIL BORING LOCATION
TEL TELEPHONE SERVICE BOX
UTILITY BOX
UTILITY RISER
FLOW DIRECTION
GI GRATE INLET
MITERED END SECTION
STORM SEWER MANHOLE

BUSH
TREE
OAK TREE
PALM TREE
PINE TREE
TH-1 TEST HOLE
B-1 BORE HOLE
EDGE OF VEGETATION
CHAIN LINK FENCE
WOOD FENCE
BARBED WIRE FENCE
RAIL ROAD TRACKS
EDGE OF CONCRETE
EDGE OF ROAD
TOE OF SLOPE
TOP OF BANK
PROPERTY LINE
RIGHT OF WAY

ABBREVIATIONS

R/W	RIGHT OF WAY
CONC	CONCRETE
ASPH	ASPHALT
DRWY	DRIVEWAY
SWK	SIDEWALK
EP	EDGE OF PAVEMENT
BOC	BACK OF CURB

No.	REVISIONS	DATE	BY

Kimley»Horn
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KHA PROJECT 148400016
DATE 6/14/2018
SCALE AS SHOWN
DESIGNED BY WWW
DRAWN BY LMB
CHECKED BY WEW

Manatee County FLORIDA

END OF SERVICE LIFE - PACKAGE A:
FM 28A/ PORT MANATEE/ ORLANDO AVE.
MANATEE COUNTY FL

LICENSED PROFESSIONAL
W. WADE WOOD, P.E
FL LICENSE NUMBER 69051
DATE:

SURVEY AND SUE NOTES

SHEET NUMBER 3

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

LEGEND
OPEN CUT
HDD

14TH STREET WEST

5TH STREET WEST

19 20 21 22 23

10" PVC FM
PROPOSED POINT OF CONNECTION TO EXISTING MANHOLE

10" PLUG VALVE

10" PLUG VALVE

LIFT STATION 26A
RTU#418

ORLANDO AVENUE

ORLANDO AVENUE

ARV ASSEMBLY

10" HDPE FM

10" PVC FM

ARV ASSEMBLY

10" HDPE FM

10" PVC FM

14TH STREET WEST

MINEOLA STREET

ORLANDO CIRCLE

PARK ACRES DRIVE

No.	REVISIONS	DATE	BY

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KHA PROJECT	148400016
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DRAWN BY	LMB
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Manatee County FLORIDA

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FM 28A/ PORT MANATEE/ ORLANDO AVE.

MANATEE COUNTY FL

LICENSED PROFESSIONAL

W. WADE WOOD, P.E

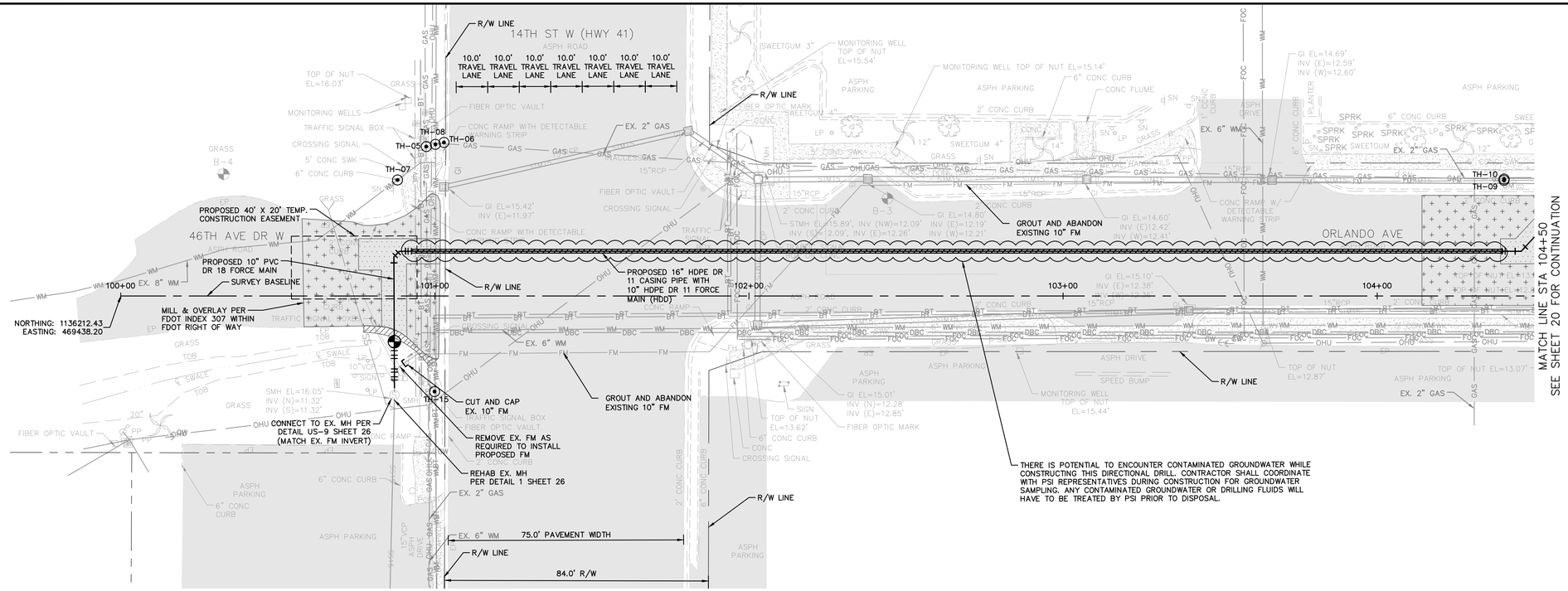
FL LICENSE NUMBER
69051

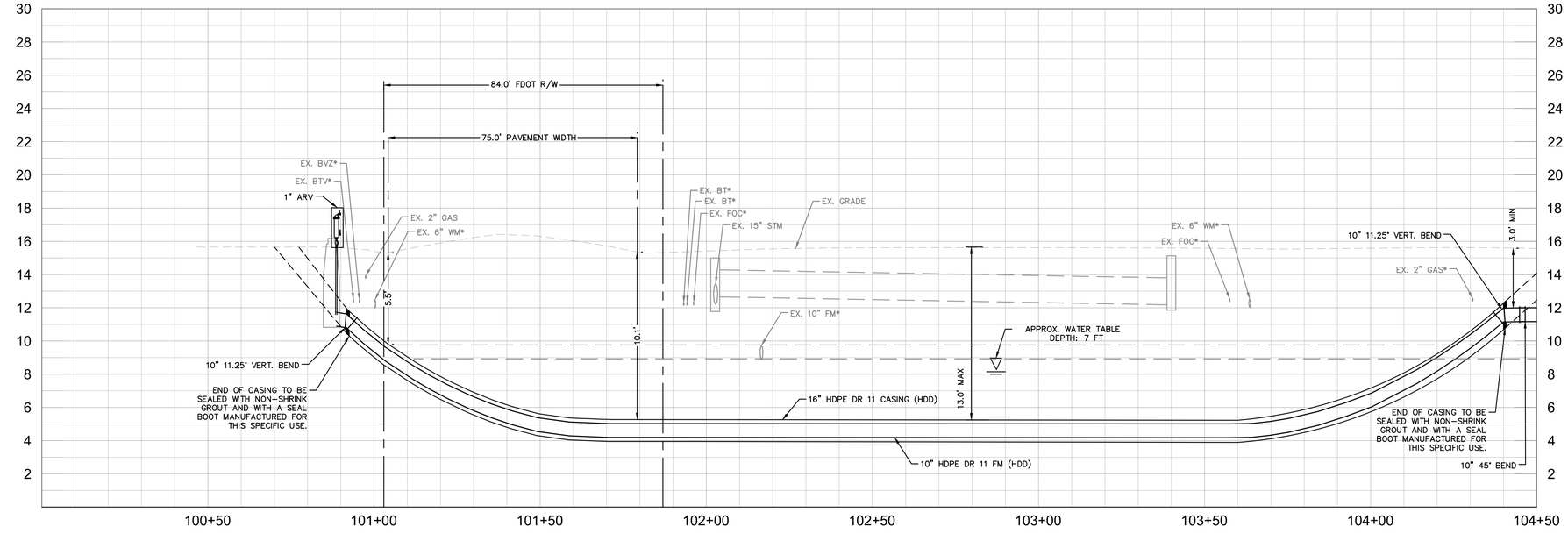
DATE:

ORLANDO AVE. FORCE MAIN KEY SHEET

SHEET NUMBER
18

Approved
2018-H-194-227
Leon Herndon
9/19/2018





GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

LEGEND

- SIDEWALK/DRIVEWAY RESTORATION
- FULL ROADWAY RESTORATION
- MILLING AND RESURFACING
- REMOVE & REPLACE CURB

NOTES:

1. CONTRACTOR TO FOLLOW RESTRAINED LENGTHS SET IN RESTRAIN LENGTH DETAILS ON SHEET 25 & 26.
2. CONSTRUCTION DEWATERING SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO CHAPTERS 62-621.300 AND 62-620 OF THE FLORIDA ADMINISTRATIVE CODE (FAC).
3. REFER TO DETAIL UG-12 SHEET 24 FOR COUNTY ROADWAY REPAIR REQUIREMENTS
4. EXISTING FORCE MAIN SHALL BE FLUSHED PRIOR TO GROUTING AFTER THE PROPOSED FORCE MAIN HAS BEEN PLACED INTO SERVICE.
5. CONTRACTOR TO COORDINATE WITH PSI REPRESENTATIVES DURING CONSTRUCTION. ALL GROUNDWATER CREATED BY DEWATERING WILL HAVE TO BE TREATED.

*NOTES:
THE ELEVATIONS OF THE UTILITIES MARKED WITH AN ASTERISK (*) HAVE BEEN ASSUMED ON THE BASIS OF TYPICAL ANTICIPATED SOIL COVERAGE. CONTRACTOR SHALL NOT RELY ON THIS INFORMATION FOR CONSTRUCTION, BUT SHALL BE RESPONSIBLE FOR FIELD LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL UTILITIES CROSSING THE PROPOSED FORCE MAIN. CONTRACTOR SHALL INCLUDE IN THE UNIT COST OF THE SUBJECT FORCE MAIN CONSTRUCTION, THE COST OF UTILITY ADJUSTMENTS NECESSARY TO ATTAIN DESIGN MINIMUM SEPARATION FOR UTILITIES CONFLICTING WITH THE CONSTRUCTION OF THE PROPOSED FORCE MAIN. INTERRUPTIONS OF ANY EXISTING UTILITY SERVICES SHALL BE NOTICED TO EFFECTED CUSTOMERS A MINIMUM OF 48 HOURS IN ADVANCE AND SHALL NOT EXCEED 4 HOURS IN DURATION.

WHERE CONCRETE REPAIRS ARE NECESSARY AND EXPANSION JOINTS ARE PRESENT, CONTRACTOR TO REMOVE AND REPLACE CONCRETE UP TO THE NEXT EXPANSION JOINT; OTHERWISE, REPLACE CONCRETE AS NECESSARY.

GROUNDWATER / DEWATERING NOTE:
THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS.

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
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www.callsunshine.com

No.	REVISIONS	DATE	BY

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KHA PROJECT 148400016
DATE 7/12/2018
SCALE AS SHOWN
DESIGNED BY WWW
DRAWN BY LMB
CHECKED BY WEW

Manatee County FLORIDA

END OF SERVICE LIFE - PACKAGE A:
FM 28A/ PORT MANATEE/ ORLANDO AVE.
MANATEE COUNTY FL

LICENSED PROFESSIONAL
W. WADE WOOD, P.E
FL LICENSE NUMBER 69051
DATE:

PLAN AND PROFILE ORLANDO AVENUE

SHEET NUMBER 19

Approved 2018-H-194-227 Leon Herndon 9/19/2018

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 6

PROJECT NAME: Orlando Ave FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

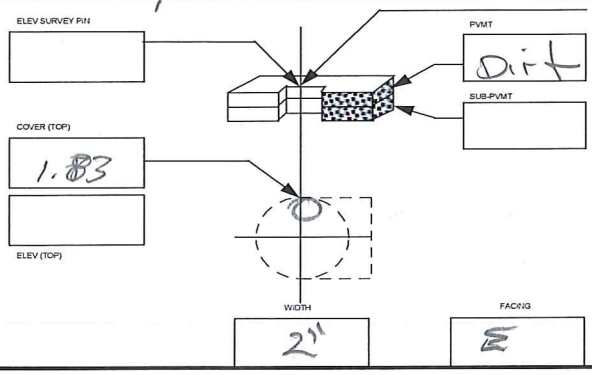
REQUESTED UTILITY: WATER RWM STORM SAN FM
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

LOCATED UTILITY: WATER RWM STORM SAN FM
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP
TILE TERRA-COTTA CONC ACP RCP PVC (PE) HDPE FOC
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: 2" **SIZE EXPECTED:** 2"

UTILTIY COLOR: Yellow



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By. : ML **COVER CHECKED BY:** JC

FORM BY: ML **ASSITED BY:** JC

NUMBER OF HOLES DUG: 1 **TODAY'S DATE:**

INSTALLED: (HUB) PIN CHISX NAIL

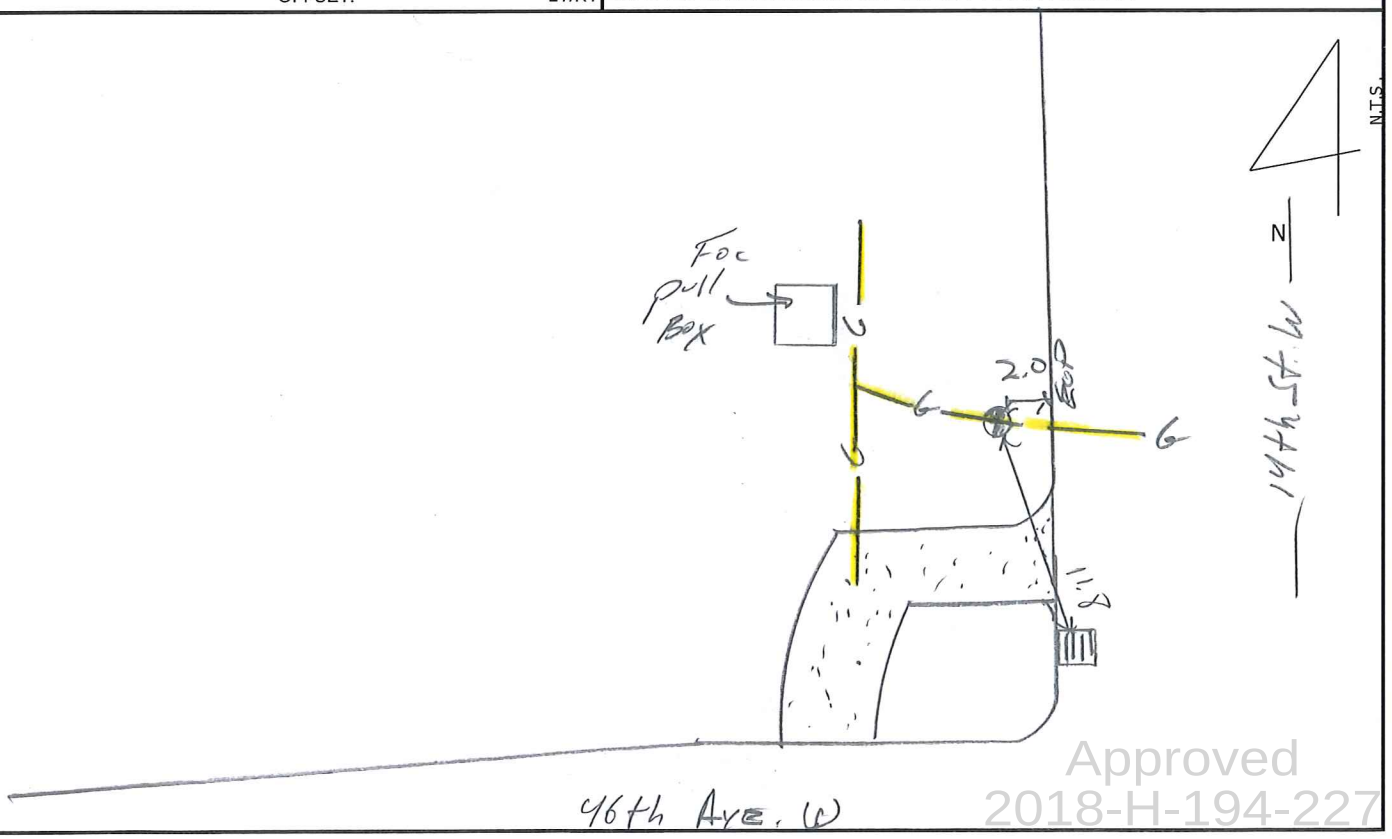
AT: (CROWN) or EDGE side of utility: E W S N

DIGITAL PHOTO (Y) N No. _____

NOTES: Found 2" PE GAS. LINE

VACUUMED: AIR LANCED:

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



Approved
2018-H-194-227
Leon Herndon
9/19/2018

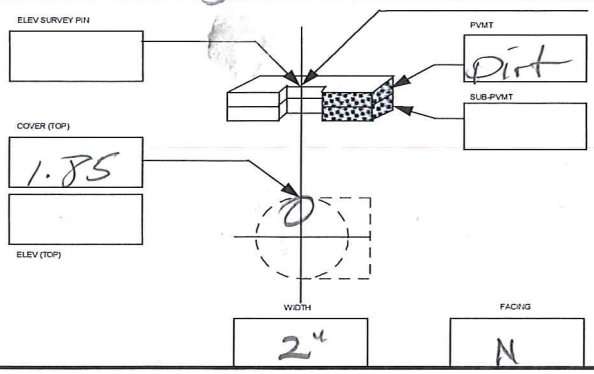
5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 5

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: Locating Designating	**Cover Estab By.:** ML **COVER CHECKED BY:** JC
REQUESTED BY: FDC	**FORM BY:** ML **ASSITED BY:** JC
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NUMBER OF HOLES DUG:** 1 **TODAY'S DATE:** **INSTALLED:** HUB PIN CHISX NAIL **AT:** CROWN or EDGE side of utility: E W S N **DIGITAL PHOTO** Y N No. _____
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NOTES:** Found 2" PE GAS
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	
SIZE AS FOUND: 2" **SIZE EXPECTED:** 2"	
UTILTIY COLOR: ORANGE	

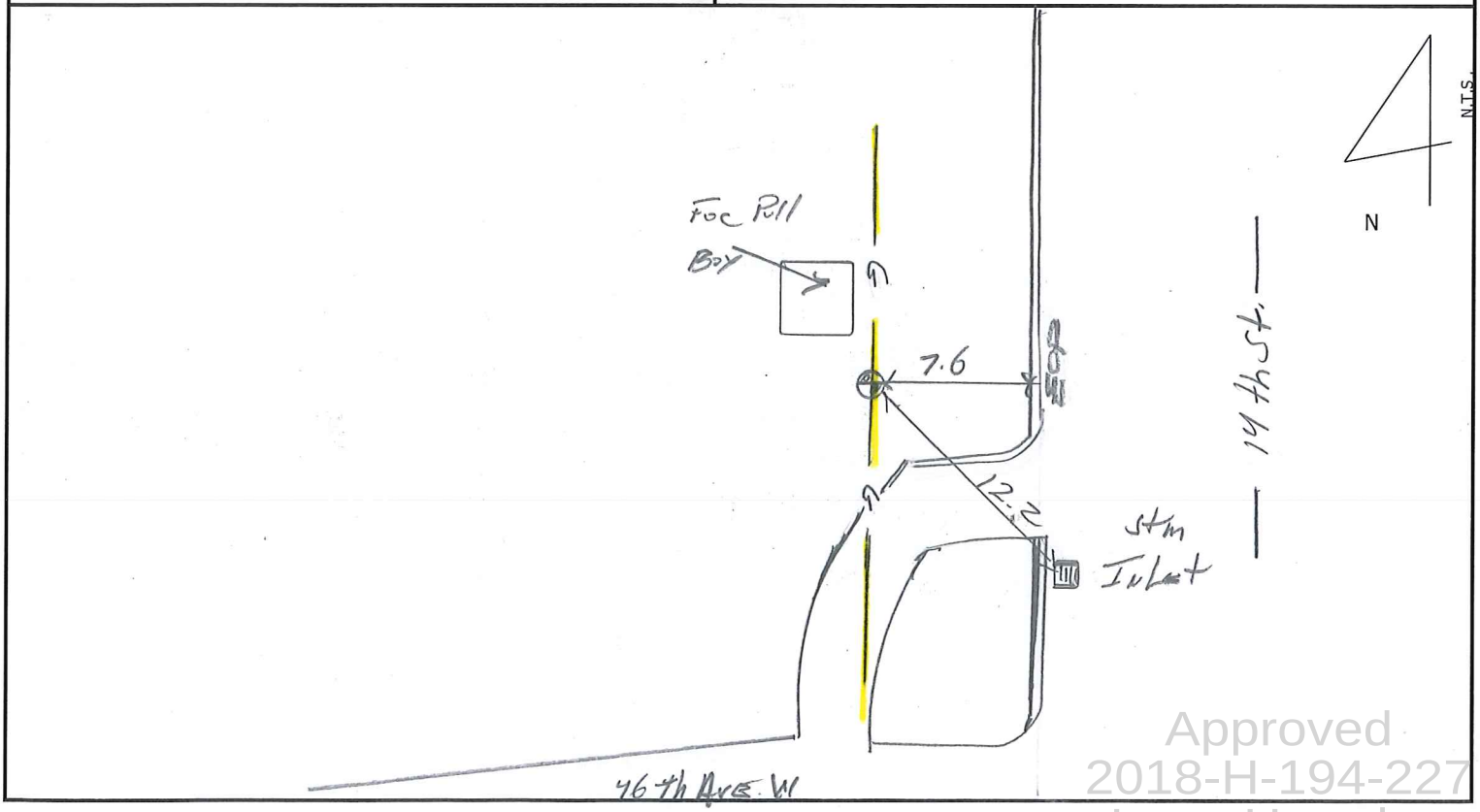


VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

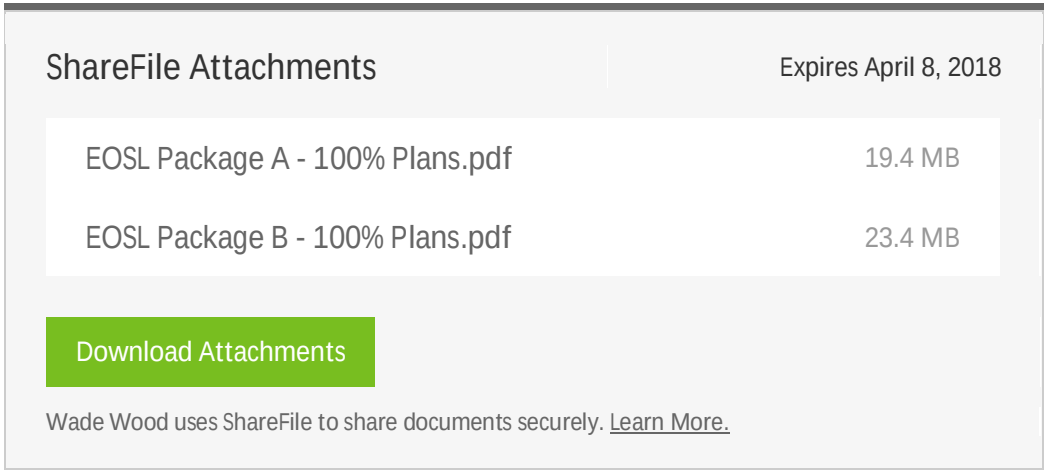

Orlando Ave FM
Legend
Exisitg FM Route
Lift Station 418
EXISTING 2" PE GAS MAIN
EXISTING 2" PE GAS MAIN
Manhole (POC)
Orlando Ave
Orlando Ave
Seminole St
Graveland St
Hwy 41
Lemonwood Ave
Temple Ave
Fruitland Ave
Melody Ln
Park Acres Dr
Park Cir
45
900 ft
N
Approved
2018-II-194-227
Leon Herndon
9/19/2018
Google earth
© 2016 Google

Bohmann, Lindsey

From: Wood, Wade
Sent: Tuesday, October 10, 2017 9:33 AM
To: cerrato.eng@verizon.net
Cc: Tondreault, Jamison; Bohmann, Lindsey
Subject: Manatee County EOSL Project
Attachments: Attachments.html

John-
I know some of our group has been in contact with you previously. We have finished our design on the aforementioned project and wanted to give you an opportunity to review and see if you have any concerns. Please feel free to reach out to us if you have any concerns.

Thanks,



W. Wade Wood III, P.E.
Kimley-Horn | 655 North Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813-635-5583 | Mobile: 321-299-2395
Connect with us: Twitter | LinkedIn | Facebook | Instagram

Bohmann, Lindsey

From: Cerrato Engineering <cerrato.eng@verizon.net>
Sent: Saturday, June 3, 2017 9:18 AM
To: Bohmann, Lindsey; 'Richard Dorio'
Cc: Hughes, Shelby; Tondreault, Jamison; 'Shanahan, Daniel J.'
Subject: RE: Manatee County Force Main Location

Lindsey,

Unfortunately we don't have as- built for this line.

I have included Dan Shanahan/PGS Sarasota Engineer in this email.

He may have asbuilts in his office

John D. Cerrato P.E
Cerrato Engineering
1312 Apollo Beach Blvd. Suite H
Apollo Beach, FL. 33572
Office (813)645-2700
Cell (813)714-9856

From: Bohmann, Lindsey [mailto:Lindsey.Bohmann@kimley-horn.com]
Sent: Friday, June 2, 2017 10:21 AM
To: Richard Dorio
Cc: 'Cerrato Engineering'; Hughes, Shelby; Tondreault, Jamison
Subject: RE: Manatee County Force Main Location

Good Morning Richard,

A few months ago you sent me the attached image of the TECO utilities located along Orlando Avenue in Manatee County. I am working on the design of the proposed force main and wanted to check with you to see if you know the approximate depth of these 2" gas lines.

Thank you for your help and if you have any questions please do not hesitate to contact us

Lindsey Bohmann
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | www.kimley-horn.com

Celebrating ten years as one of FORTUNE's 100 Best Companies to Work For

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From: Richard Dorio [mailto:rvdoriojr@verizon.net]
Sent: Friday, February 24, 2017 12:15 PM
To: Bohmann, Lindsey <Lindsey.Bohmann@kimley-horn.com>
Cc: 'Cerrato Engineering' <cerrato.eng@verizon.net>
Subject: RE: Manatee County Force Main Location

Mrs. Bohmann,

Attached are TECO PGS's markups for the force main Locations

Richard Dorio Jr
Cerrato Engineering
1312 Apollo Beach Blvd.
Apollo Beach, FL 33572
(813) 645-2700

From: Cerrato Engineering [mailto:cerrato.eng@verizon.net]
Sent: Friday, February 24, 2017 9:00 AM
To: 'Richard Dorio'
Subject: FW: Manatee County Force Main Location

John D. Cerrato P.E
Cerrato Engineering
1312 Apollo Beach Blvd. Suite H
Apollo Beach, FL. 33572
Office (813)645-2700
Cell (813)714-9856

From: Lindsey.Bohmann@kimley-horn.com [mailto:Lindsey.Bohmann@kimley-horn.com]
Sent: Thursday, February 23, 2017 7:36 AM
To: cerrato.eng@verizon.net
Subject: RE: Manatee County Force Main Location

Good Morning John,

Any progress with those force main files?

Thank you for all of your help,

Lindsey

Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | www.kimley-horn.com

Celebrating nine years as one of FORTUNE's 100 Best Companies to Work For

From: Cerrato Engineering [mailto:cerrato.eng@verizon.net]
Sent: Monday, February 20, 2017 2:06 PM
To: Bohmann, Lindsey <Lindsey.Bohmann@kimley-horn.com>
Cc: 'Shanahan, Daniel J.' <djshanahan@tecoenergy.com>
Subject: RE: Manatee County Force Main Location

Thanks

Expect to forward PGS disposition by tomorrow.

John D. Cerrato P.E
Cerrato Engineering
1312 Apollo Beach Blvd. Suite H
Apollo Beach, FL. 33572
Office (813)645-2700
Cell (813)714-9856

From: Lindsey.Bohmann@kimley-horn.com [mailto:Lindsey.Bohmann@kimley-horn.com]
Sent: Monday, February 20, 2017 1:14 PM
To: cerrato.eng@verizon.net
Subject: Manatee County Force Main Location

Hey John,

As mentioned here are some nearby addresses for the Manatee County force mains:

FM 15A
601 N Bay Blvd
Bradenton Beach, FL 34216

FM 8
402B Clark Dr
Holmes Beach, FL 34217

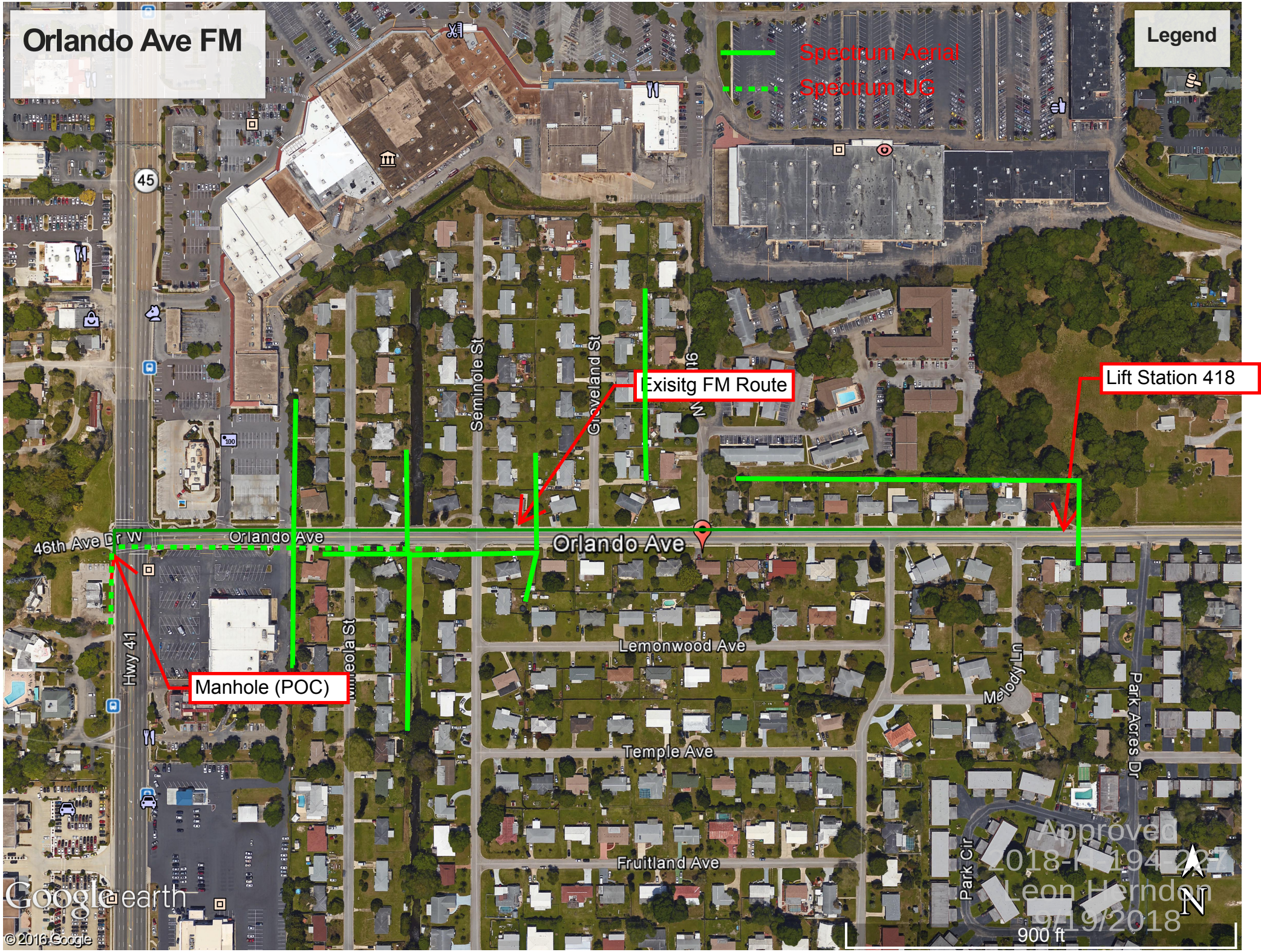
FM 28A
2311 57th Ave W
Bradenton, FL 34207

FM Orlando Ave
4573 14th St W
Bradenton, FL 34207

Thank you again and if you have any questions please give me a call.

Lindsey

Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | www.kimley-horn.com

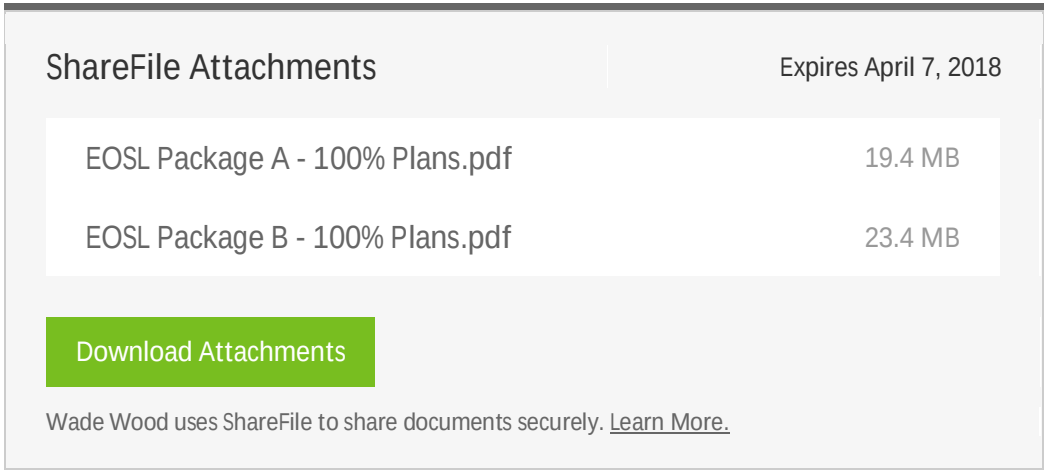

Orlando Ave FM
Legend
Spectrum Aerial
Spectrum UG
Exisitg FM Route
Lift Station 418
Manhole (POC)
Orlando Ave
Orlando Ave
46th Ave Dr W
Hwy 41
Seminole St
Groveland St
Lemonwood Ave
Temple Ave
Fruitland Ave
Melody Ln
Park Acres Dr
Park Cir
Approved
2018-1194
Leon Herndon
9/19/2018
900 ft
N
Google earth
© 2016 Google

Bohmann, Lindsey

From: Wood, Wade
Sent: Tuesday, October 10, 2017 8:18 AM
To: James.Cruzan@charter.com
Cc: Bohmann, Lindsey; Tondreault, Jamison
Subject: Manatee County EOSL Projects
Attachments: Attachments.html

Jim-
We have completed our design for the Manatee County. Attached are our 100% plans for review and comment. If you have any concerns, please feel free to reach out to us.

Thanks,



W. Wade Wood III, P.E.
Kimley-Horn | 655 North Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813-635-5583 | Mobile: 321-299-2395
Connect with us: Twitter | LinkedIn | Facebook | Instagram

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Bohmann, Lindsey

From: Cruzan, James L <James.Cruzan@charter.com>
Sent: Friday, February 17, 2017 3:52 PM
To: Bohmann, Lindsey
Subject: RE: Utility Notification Progress
Attachments: Orlando Ave Utilities.pdf; Port Manatee FM.pdf

Charter COMMUNICATIONS

Jim Cruzan | Field Engineer IV| 727-329-2846
5413 E SR 64 | Bradenton, FL 34208

From: Lindsey.Bohmann@kimley-horn.com [mailto:Lindsey.Bohmann@kimley-horn.com]
Sent: Tuesday, February 14, 2017 12:23 PM
To: Cruzan, James L
Subject: Utility Notification Progress

ShareFile Attachments

Title	Size
Force Main 15A Utilities.pdf	6.1 MB
Force Main 1C Utilities.pdf	8.8 MB
Force Main 28A Utlities.pdf	7.1 MB
Force Main 8 Utilities.pdf	6 MB
Orlando Ave Utilities.pdf	6.5 MB
Port Manatee FM Utilities.pdf	6 MB

Good Afternoon Jim,

Last week I sent you an email requesting that you specify the approximate location of any utilities owned or operated by your organization in the areas specified on the attached aerials. If possible, I would like to have the location of your utilities by the end of this week. Please get this information to me at your earliest convenience and let me know if you do not think that you could have this to me by the end of the week.

Thanks for your help, and if you have any additional questions, please do not hesitate to contact us.

Lindsey

Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | www.kimley-horn.com

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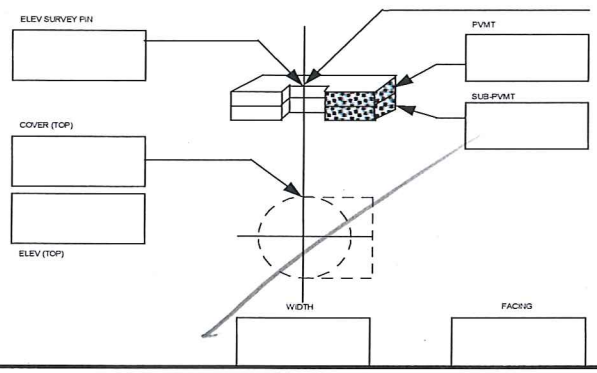
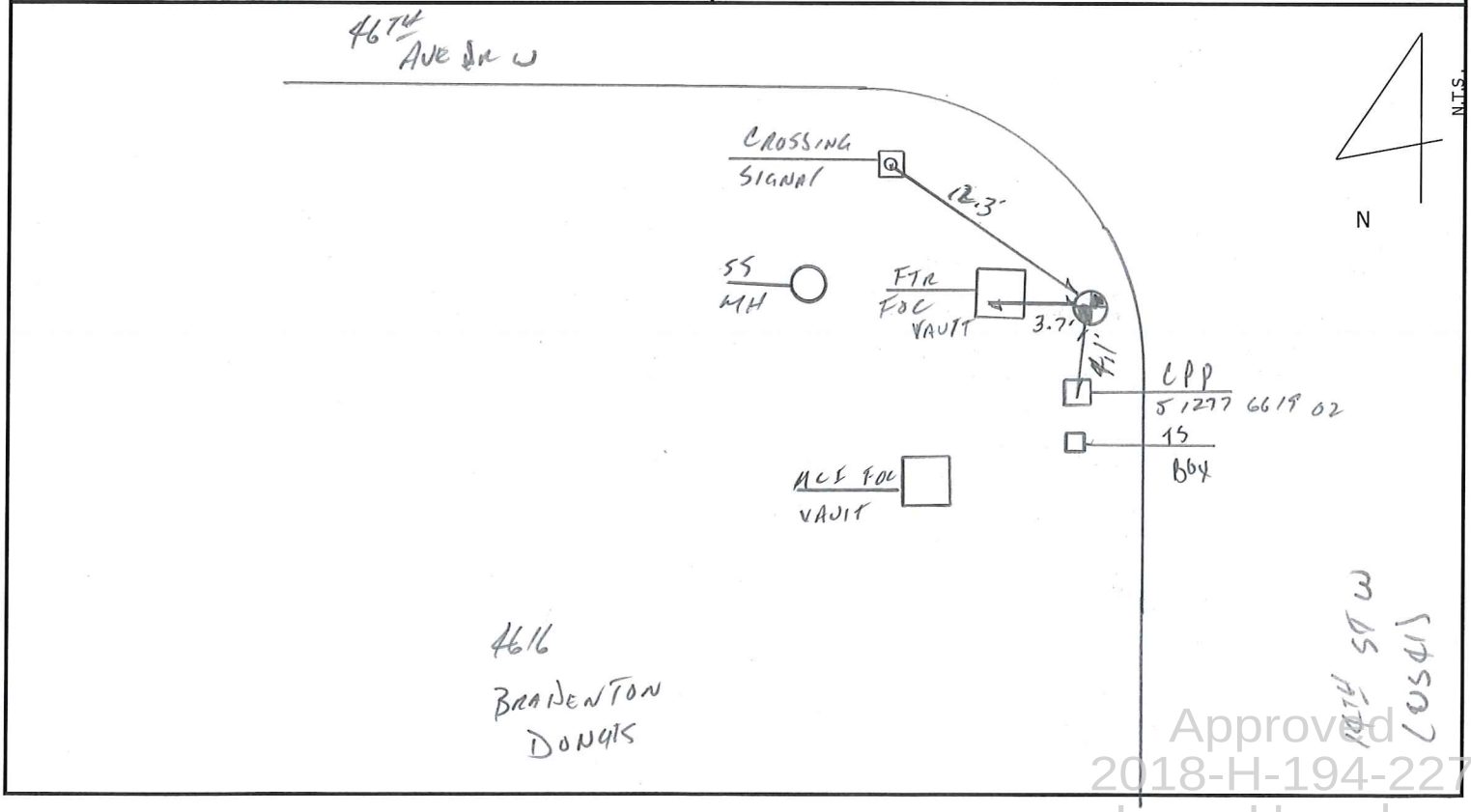
Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-063
Test Hole No.: 15

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** A.C. **COVER CHECKED BY:** J Coleman
REQUESTED BY: FDC	**FORM BY:** PS **ASSITED BY:** K.P
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NUMBER OF HOLES DUG:** **TODAY'S DATE:** 12/13/17
	INSTALLED: (HUB) PIN CHISX NAIL
	AT: CROWN or EDGE side of utility: E W S N
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**DIGITAL PHOTO** (Y) N No. _____
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**NOTES:** NO DETECTION ON WTR LINE 810 - GIR - NO
SIZE AS FOUND: **SIZE EXPECTED:**	
UTILTIY COLOR:	BOOK - OMNI 2 PG - 32
	VACUUMED: 5' AIR LANCED: 10'
SURVEY PIN LOCATED BY: FDC	THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.
STATION OFFSET: LT/RT	





Approved
2018-H-194-227
Leon Herndon
9/19/2018

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 8

PROJECT NAME: Orlando Ave FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

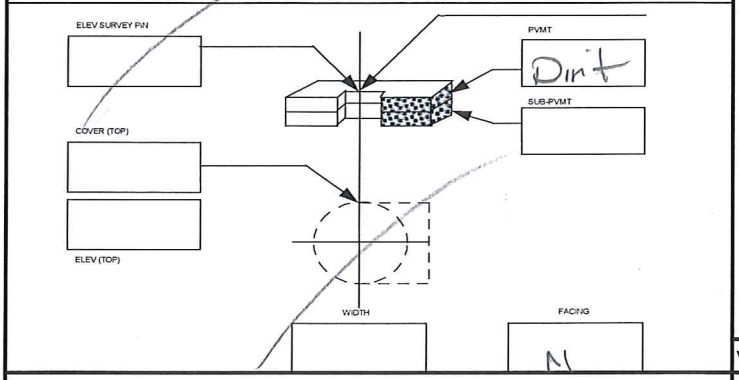
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION (EXPLORE) UNK N/A OTHER: _____

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: **SIZE EXPECTED:**

UTILTIY COLOR:



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By. : MG **COVER CHECKED BY:** JC

FORM BY: MG **ASSITED BY:** JC

NUMBER OF HOLES DUG: 3 **TODAY'S DATE:**

INSTALLED: HUB PIN CHISX NAIL

AT: CROWN or EDGE side of utility: E W S N

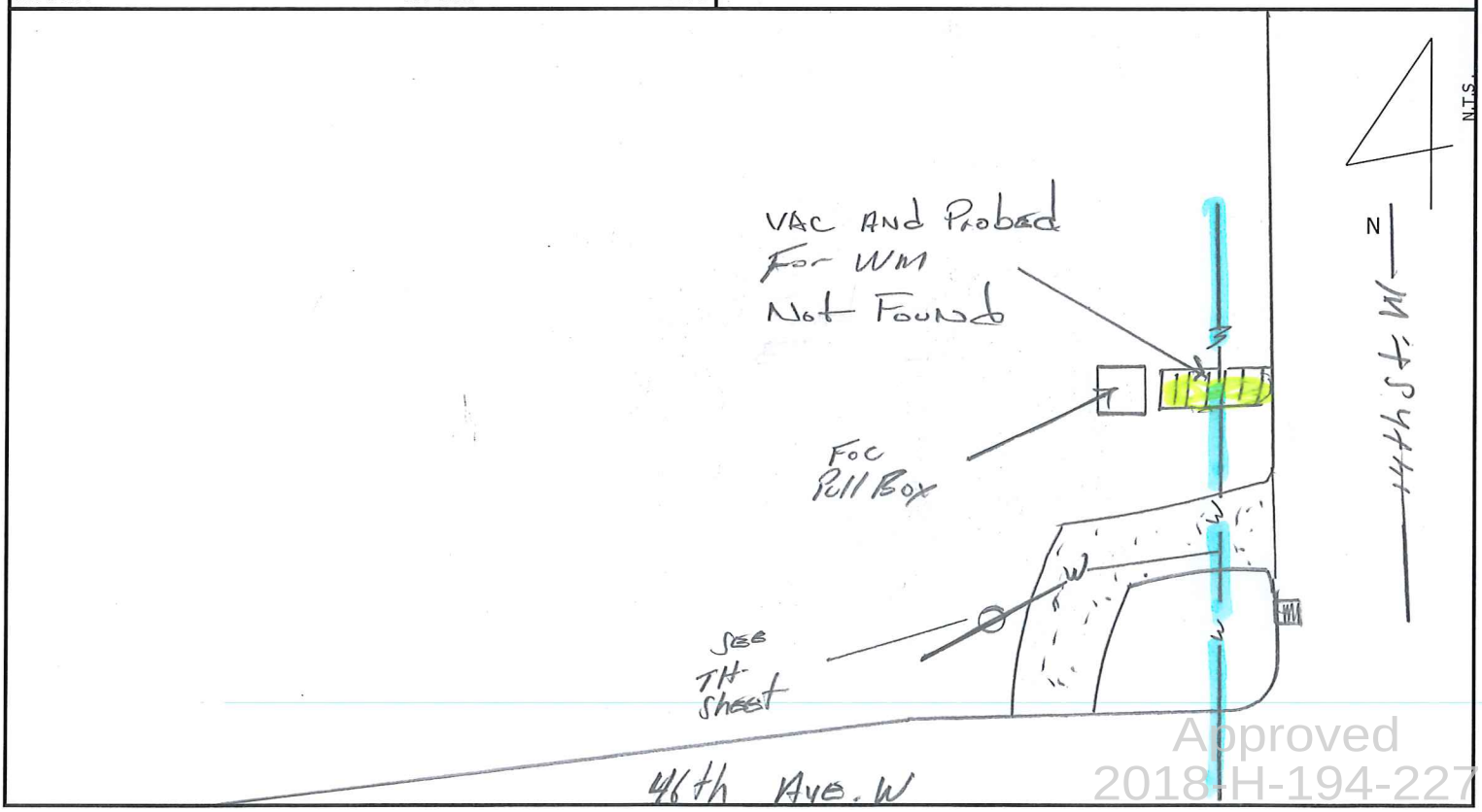
DIGITAL PHOTO Y N No. _____

NOTES:

VAC AND Probed Both sides of WM 1-Call Marks (Not Found.)
GPR Not Detecting - Bad Grd Conditions, shell, Hard Layers Will Take VAC. Some time To Locate

VACUUMED: 3' AIR LANCED: 10'

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.

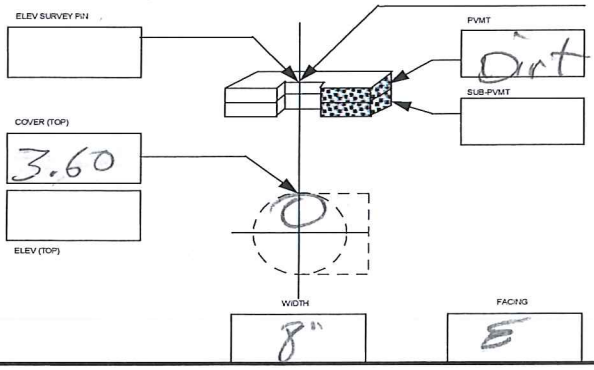


Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 7

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** MC **COVER CHECKED BY:** JC
REQUESTED BY: FDC	**FORM BY:** MC **ASSITED BY:** JC
REQUESTED UTILITY: (WATER) RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NUMBER OF HOLES DUG:** 1 **TODAY'S DATE:**
LOCATED UTILITY: (WATER) RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**INSTALLED:** (HUB) PIN CHISX NAIL **AT:** (CROWN) or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP (PVC) PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**DIGITAL PHOTO** (Y) N No. _____
SIZE AS FOUND: 8" **SIZE EXPECTED:** 8"	**NOTES:** FOUND 8" PVC W-LINE
UTILTIY COLOR: BLUE	

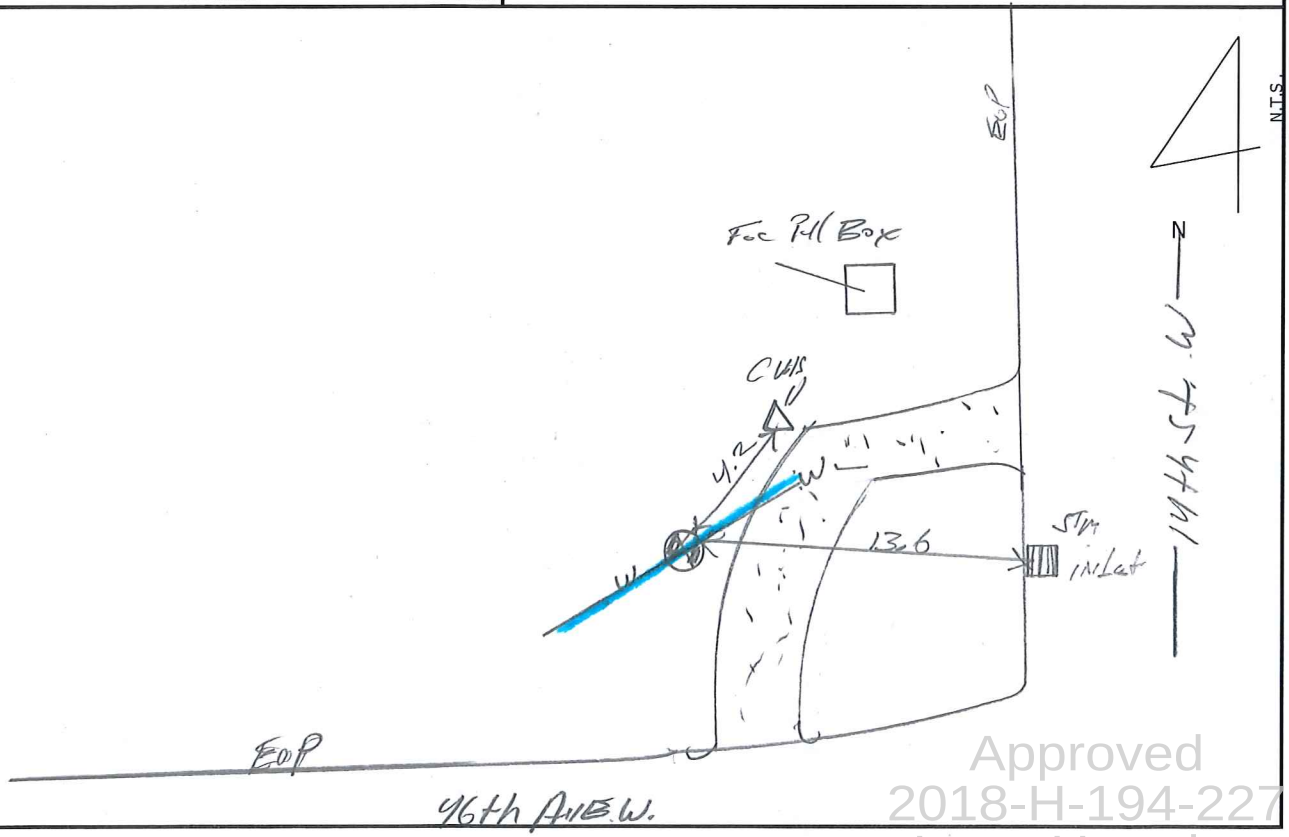


VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



Bohmann, Lindsey

From:	Kathy McMahon <kathy.mcmahon@mymanatee.org>
Sent:	Tuesday, February 14, 2017 11:15 AM
To:	Aaron Burkett; Bill Kersey; Chris Mowbray; Dave Branning; David Schofield; Ed Ference; Frank Conetta; Gerardo Traverso; Jim Stockwell; John Pari; Keith McMahen; Kenneth Kohn; Kenneth LaBarr; Michael Sturm; Mukunda Gopalakrishna; Peggy Hines; Robert Shankle; Ryan Beggy; Sage Kamiya; Scott May; Shea Shoun; Tom Gerstenberger; Vishal Kakkad
Cc:	Bohmann, Lindsey; Peggy Hines; Keith McMahen
Subject:	FW: Request for Utility Locations in Manatee County
Attachments:	Attachments.html

The following correspondence has been emailed to me. I am forwarding it on to your offices for review and/or comment. Please respond to Ms. Bohmann directly. I have uploaded a general map of our underground facilities and the corresponding record drawings/as-builts we have filed in our database to our FTP Site (https://www.mymanatee.org/uploader/). You will receive a separate email from "noreply" with instructions on how to retrieve them. If you do not receive it by the end of day, check your spam or junk mail folder in case it gets caught there. Should you have any questions or need further assistance, please contact me. Thank you.
https://www.mymanatee.org/uploader/?ShareToken=B4BF53833C037710C666FBF4DC9BC27254D1418D

Kathy McMahon
Manatee County Utility Records
4520 – 66th Street West
Bradenton, FL 34210
941-792-8811 #5002

From: Lindsey.Bohmann@kimley-horn.com [mailto:Lindsey.Bohmann@kimley-horn.com]
Sent: Wednesday, February 08, 2017 5:19 PM
To: Kathy McMahon
Subject: FW: Request for Utility Locations in Manatee County

ShareFile Attachments	
Title	Size
Force Main 15A Utilities.pdf	6.1 MB
Force Main 1C Utilities.pdf	8.8 MB
Force Main 28A Utlities.pdf	7.1 MB
Force Main 8 Utilities.pdf	6 MB
Orlando Ave Utilities.pdf	6.5 MB
Port Manatee FM.pdf	6 MB

Download Attachments

Lindsey Bohmann uses ShareFile to share documents securely. Learn More.

Hi Kathy,

Kimley-Horn and Associates, Inc. has been authorized by Manatee County to design several force main replacements. The new pipe diameter and location is described below and the proposed location can be seen in the attached aerials.
The general location for each force main:

1. Force main 1C- Approximately 2,500 feet of 6 inch force main from Lift Station 054 to a point of connection to the existing Force Main 5.
2. Force main 8- Approximately 1,400 feet of 6 inch force main from Lift Station 063 to a manhole at the intersection of Marina Drive and Clark Drive.
3. Force main 15A- Approximately 1,700 feet of 6 inch force main from Lift Station 067 to a manhole along North Bay Blvd.

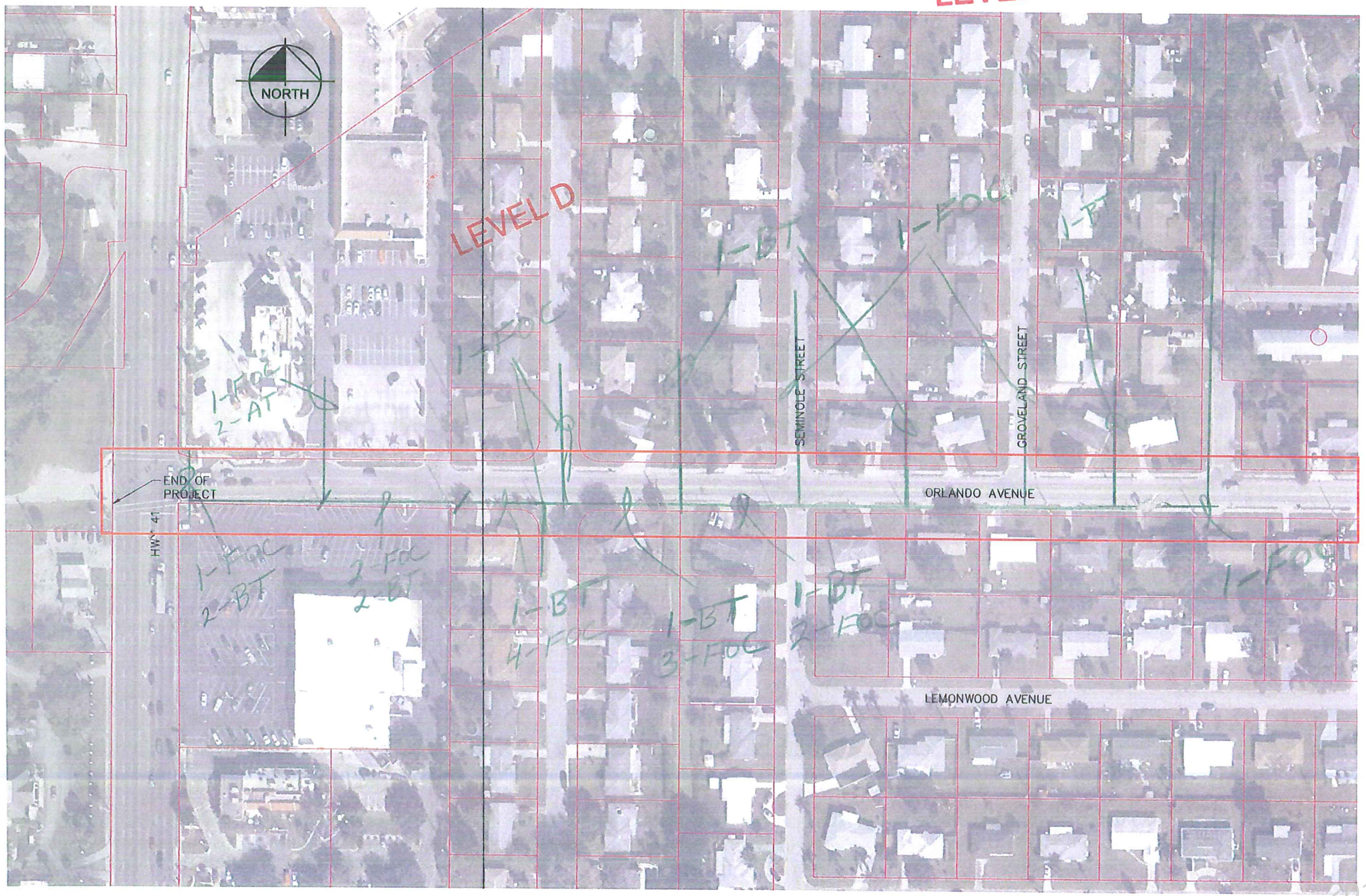
4. Force main 28A- Approximately 1,500 feet of 4 inch force main from the Lift Station 130 to a manhole north of the intersection of 57th Avenue West and 24th Street West. Additionally, approximately 275 feet of 4 inch force main from US Post Office Lift Station to a manhole south of 57th Avenue West along 20th Street West.
5. Orlando Avenue- Approximately 2,300 feet of 10 inch force main from Lift Station 26A to a manhole at the intersection of Orlando Avenue and US 41. Additionally, 215 feet of 3 inch force main from the Cortez Plaza Lift Station to a manhole off of 5th Street West.
6. Port Manatee- Approximately 2,000 feet of 4 inch force main from Lift Station 512 to a manhole near North Dock Street and Eastern Avenue.

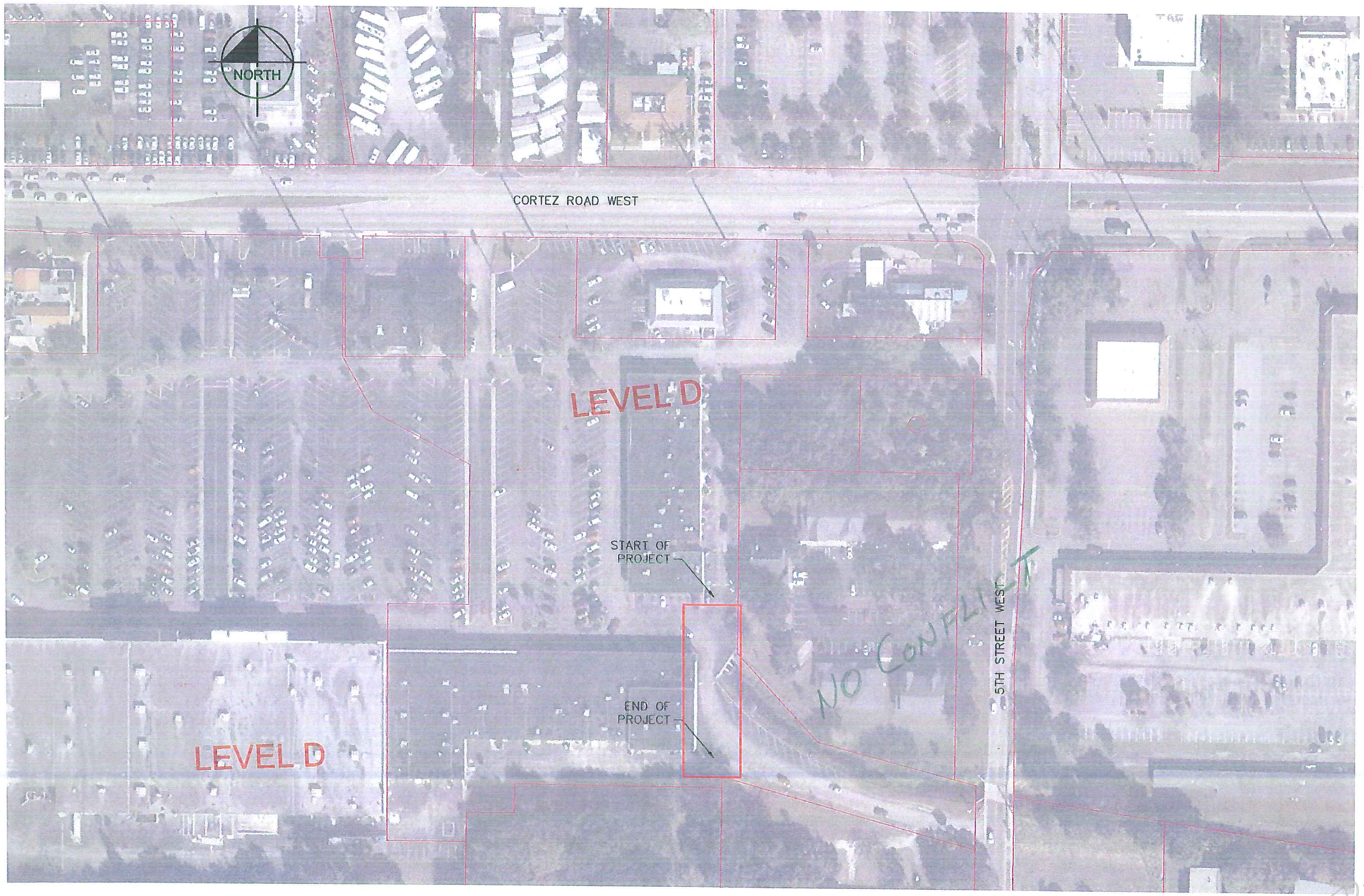
Kimley-Horn is requesting that you specify the approximate location of any utilities owned or operated by your organization in these areas. Please mark the approximate locations on the attached sheets and/or include as-builts and record drawings along with any service request forms or guidelines regarding resolution procedures in the event of a conflict.

Thanks for your help, and if you have any additional questions, please do not hesitate to contact us.

Lindsey

Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | Mobile: 772 713 9740 | www.kimley-horn.com



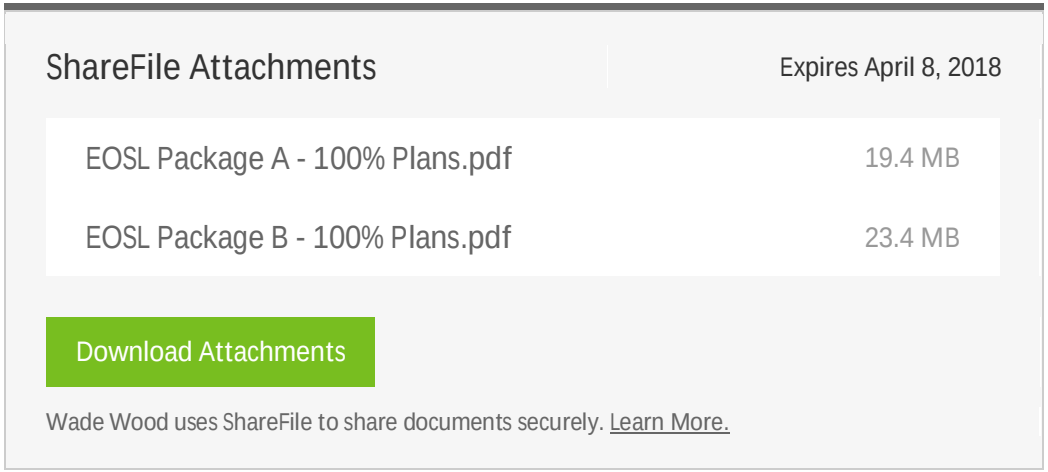


Bohmann, Lindsey

From: Wood, Wade
Sent: Tuesday, October 10, 2017 8:44 AM
To: Patti.Reid@ftr.com
Cc: Tondreault, Jamison; Bohmann, Lindsey
Subject: Manatee County EOSL Project
Attachments: Attachments.html

Patti-
I know we coordinated early on this the process, but we have finalized our plans, please see attached. We wanted to pass the final plans along to see if you have any comments or concerns. If so, please feel free to reach out.

Thanks,



W. Wade Wood III, P.E.
Kimley-Horn | 655 North Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813-635-5583 | Mobile: 321-299-2395
Connect with us: Twitter | LinkedIn | Facebook | Instagram

Celebrating 10 years as one of FORTUNE's 100 Best Companies to Work For

Bohmann, Lindsey

From: Reid, Patti <patti.reid@ftr.com>
Sent: Friday, March 17, 2017 12:41 PM
To: Bohmann, Lindsey
Subject: RE: ORLANDO AVE MARK UP COMPLETE.
Attachments: 20170317123230405.pdf

Mark-up complete.

Patti Reid
Engr SPEC-NTWK ENG&OPS
Frontier Communications
1701 Ringling Blvd
Sarasota Fl 34236
Ofc 941-906-6711
PATTI.REID@FTR.COM

WWW.FRONTIER.COM

Be strong enough to stand alone, smart enough to know when you need help, and brave enough to ask for it.

From: Lindsey.Bohmann@kimley-horn.com [mailto:Lindsey.Bohmann@kimley-horn.com]
Sent: Thursday, March 09, 2017 9:39 AM
To: Reid, Patti <patti.reid@ftr.com>
Subject: RE: FM-15 MARK UP COMPLETE.

Hi Patti,

Thank you for letting me know. I have attached new files that have the desired area boxed. Let me know if there are any more issues.

Thank you,
Lindsey

Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | www.kimley-horn.com

Celebrating nine years as one of FORTUNE's 100 Best Companies to Work For

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From: Reid, Patti [mailto:patti.reid@ftr.com]
Sent: Thursday, March 9, 2017 9:02 AM
To: Bohmann, Lindsey <Lindsey.Bohmann@kimley-horn.com>
Subject: RE: FM-15 MARK UP COMPLETE.

Lindsey

Got your voice mail. The others are a little confusing onto where you are working please check and bubble the area to be mark-up.

Patti Reid
Engr SPEC-NTWK ENG&OPS
Frontier Communications
1701 Ringling Blvd
Sarasota Fl 34236
Ofc 941-906-6711
PATTI.REID@FTR.COM

WWW.FRONTIER.COM

Be strong enough to stand alone, smart enough to know when you need help, and brave enough to ask for it.

From: Reid, Patti
Sent: Tuesday, March 07, 2017 1:39 PM
To: 'Lindsey.Bohmann@kimley-horn.com' <Lindsey.Bohmann@kimley-horn.com>
Subject: FM-15 MARK UP COMPLETE.

Mark-up complete.

Patti Reid
Engr SPEC-NTWK ENG&OPS
Frontier Communications
1701 Ringling Blvd
Sarasota Fl 34236
Ofc 941-906-6711
PATTI.REID@FTR.COM

WWW.FRONTIER.COM

Be strong enough to stand alone, smart enough to know when you need help, and brave enough to ask for it.

Bohmann, Lindsey

From: Bohmann, Lindsey
Sent: Tuesday, February 14, 2017 12:26 PM
To: patti.reid@ftr.com
Subject: Utility Notification Progress
Attachments: Attachments.html

ShareFile Attachments

Title	Size
Force Main 15A Utilities.pdf	6.1 MB
Force Main 1C Utilities.pdf	8.8 MB
Force Main 28A Utlities.pdf	7.1 MB
Force Main 8 Utilities.pdf	6 MB
Orlando Ave Utilities.pdf	6.5 MB
Port Manatee FM.pdf	6 MB

Download Attachments Lindsey Bohmann uses ShareFile to share documents securely. Learn More.

Good Afternoon Patti,

Last week I sent you an email requesting that you specify the approximate location of any utilities owned or operated by your organization in the areas specified on the attached aerials. If possible, I would like to have the location of your utilities by the end of this week. Please get this information to me at your earliest convenience and let me know if you do not think that you could have this to me by the end of the week.

Thanks for your help, and if you have any additional questions, please do not hesitate to contact us.

Lindsey

Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | Mobile: 772 713 9740 | www.kimley-horn.com

Celebrating nine years as one of FORTUNE’s 100 Best Companies to Work For

Bohmann, Lindsey

From: Bohmann, Lindsey
Sent: Wednesday, February 8, 2017 5:16 PM
To: patti.reid@ftr.com
Subject: Request for Utility Locations in Manatee County
Attachments: Attachments.html

ShareFile Attachments

Title	Size
Force Main 15A Utilities.pdf	6.1 MB
Force Main 1C Utilities.pdf	8.8 MB
Force Main 28A Utlities.pdf	7.1 MB
Force Main 8 Utilities.pdf	6 MB
Orlando Ave Utilities.pdf	6.5 MB
Port Manatee FM.pdf	6 MB

Download Attachments

Hi Patti,

Kimley-Horn and Associates, Inc. has been authorized by Manatee County to design several force main replacements. The new pipe diameter and location is described below and the proposed location can be seen in the attached aerials.

The general location for each force main:

1. Force main 1C- Approximately 2,500 feet of 6 inch force main from Lift Station 054 to a point of connection to the existing Force Main 5.
2. Force main 8- Approximately 1,400 feet of 6 inch force main from Lift Station 063 to a manhole at the intersection of Marina Drive and Clark Drive.
3. Force main 15A- Approximately 1,700 feet of 6 inch force main from Lift Station 067 to a manhole along North Bay Blvd.
4. Force main 28A- Approximately 1,500 feet of 4 inch force main from the Lift Station 130 to a manhole north of the intersection of 57th Avenue West and 24th Street West. Additionally, approximately 275 feet of 4 inch force main from US Post Office Lift Station to a manhole south of 57th Avenue West along 20th Street West.
5. Orlando Avenue- Approximately 2,300 feet of 10 inch force main from Lift Station 26A to a manhole at the intersection of Orlando Avenue and US 41. Additionally, 215 feet of 3 inch force main from the Cortez Plaza Lift Station to a manhole off of 5th Street West.

6. Port Manatee- Approximately 2,000 feet of 4 inch force main from Lift Station 512 to a manhole near North Dock Street and Eastern Avenue.

Kimley-Horn is requesting that you specify the approximate location of any utilities owned or operated by your organization in these areas. Please mark the approximate locations on the attached sheets and/or include as-builts and record drawings along with any service request forms or guidelines regarding resolution procedures in the event of a conflict.

Thanks for your help, and if you have any additional questions, please do not hesitate to contact us.

Lindsey

Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 | Mobile: 772 713 9740 | www.kimley-horn.com

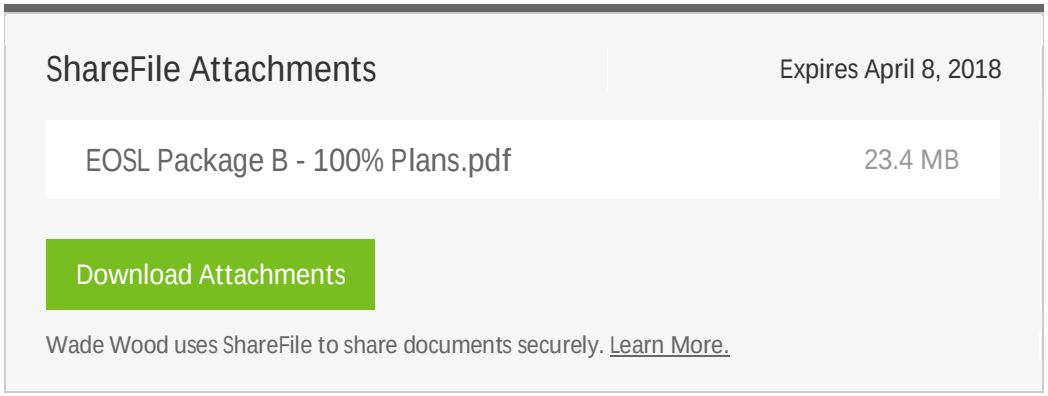
Celebrating nine years as one of FORTUNE's 100 Best Companies to Work For

Bohmann, Lindsey

From:	Wood, Wade
Sent:	Tuesday, October 10, 2017 9:43 AM
To:	danny.haskett@fibernetdirect.com
Cc:	Tondreault, Jamison; Bohmann, Lindsey
Subject:	Manatee County EOSL Projects
Attachments:	Attachments.html

Danny-
Some of our group had been in contact as we were starting our design. We have completed the design and should be going to construction early next year. We wanted to give you the chance to review the plans and see if you have any concerns. The only project that should be of concern is the Orlando Ave FM project. Please let us know if you have any questions.

Thanks,



W. Wade Wood III, P.E.
Kimley-Horn | 655 North Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813-635-5583 | Mobile: 321-299-2395
Connect with us: Twitter | LinkedIn | Facebook | Instagram

Celebrating 10 years as one of FORTUNE's 100 Best Companies to Work For

Bohmann, Lindsey

From:	Haskett, Danny <Danny.Haskett@FibernetDirect.com>
Sent:	Friday, February 10, 2017 1:55 PM
To:	Bohmann, Lindsey
Cc:	Williams, Shawn
Subject:	RE: Request for Utility Locations in Manatee County
Attachments:	FM Replacement on Orlando Ave-Bradenton-Location Map.pdf

Lindsey,

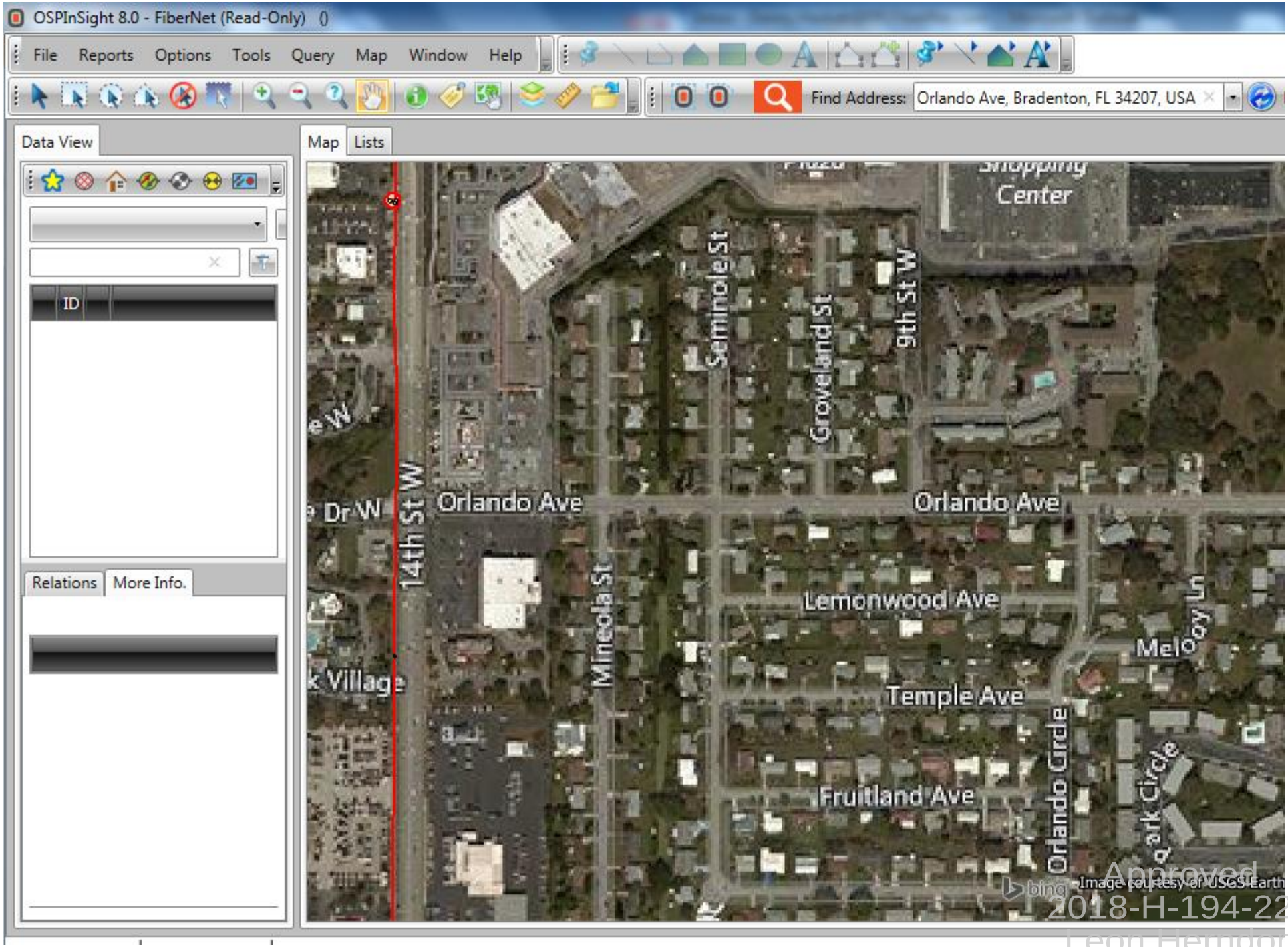
Fibernet Direct (formerly FPL FiberNet) has aerial fiber facilities, attached to FPL power poles, along the west side of US Highway 41 at Orlando Avenue. On the map below, the solid red line depicts our aerial fiber.

Since the proposed project is confined to Force Main replacements, it would seem that our aerial fiber would not be impacted. I will assume that our company will have no conflict unless I hear otherwise from you.

Please contact Sunshine State One-Call at 1-800-432-4770 or Fibernet Direct's Network Operation Center at 1-866-553-4237 at least 48 hours prior to digging near Fibernet Direct facilities. With this response, Fibernet Direct has satisfied your request for identification of our fiber optic facilities. Should you need anything more, please contact us and we will be glad to assist.

PLEASE NOTE OUR NEW NAME: Fibernet Direct

Regards, Danny



Danny Haskett | Associate Project Manager | 9250 W Flagler St Miami, FL 33174
O 305-552-2931 | **C** 786-246-7827 | Danny.Haskett@FibernetDirect.com | **FibernetDirect.com**

From: Lindsey.Bohmann@kimley-horn.com [mailto:Lindsey.Bohmann@kimley-horn.com]
Sent: Thursday, February 09, 2017 2:01 PM
To: Haskett, Danny
Subject: Request for Utility Locations in Manatee County

ShareFile Attachments

Title	Size
Orlando Ave Utilities.pdf	6.5 MB

Download Attachments Lindsey Bohmann uses ShareFile to share documents securely. Learn More.

Hi Danny,

Kimley-Horn and Associates, Inc. has been authorized by Manatee County to design several force main replacements. The Orlando Avenue force main is approximately 2,300 feet of 10 inch force main from Lift Station 26A to a manhole at the intersection of Orlando Avenue and US 41. Additionally, 215 feet of 3 inch force main from the Cortez Plaza Lift Station to a manhole off of 5th Street West. Please see the attached aerial showing the location of the work.

Kimley-Horn is requesting that you specify the approximate location of any utilities owned or operated by your organization in these areas. Please mark the approximate locations on the attached sheets and/or include as-builts and record drawings along with any service request forms or guidelines regarding resolution procedures in the event of a conflict.

Thanks for your help, and if you have any additional questions, please do not hesitate to contact us.

Lindsey

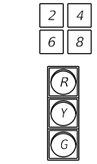
Lindsey Bohmann | Analyst
Kimley-Horn | 655 N Franklin Street, Suite 150, Tampa, FL 33602
Direct: 813 635 5550 **|** Mobile: 772 713 9740 **|** www.kimley-horn.com

Celebrating nine years as one of FORTUNE's 100 Best Companies to Work For

Below comments provided by District One Utility staff in Bartow

Date	Type	Comment
8/15/2018 8:39 AM	Review Comment	Please refer to the comments from the designer.
8/16/2018 11:46 AM	Review Comment	We are installing a Mast Arm in close proximity to the location of the existing Manhole. If the proposed Force Main is installed as shown in the plan, the Force Main will be within 1 foot of our proposed Mast Arm foundation (5 foot diameter), which will cause a conflict. We recommend connecting to the manhole from a different direction. Proposed Force Main should maintain a minimum of 6 feet of clearance from proposed Mast Arm foundation. See attached pdf for clarification.
8/14/2018 9:17 AM	Review Comment	This permit falls within the limits of FPID #433592-1 Sidewalk/Bike Lane

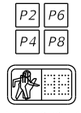
SIGNAL HEAD DETAILS



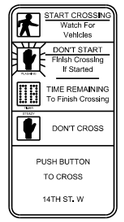
3-SECT., 1-WAY
10 AS
650-1-14

4-SECT., 1-WAY
4 AS
650-1-16

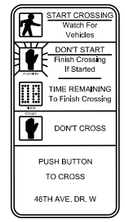
PEDESTRIAN SIGNAL HEAD & SIGN DETAILS



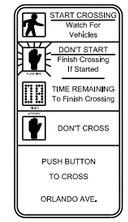
PED. SIGNAL
COUNT-DOWN
1-SECT., 1-WAY
8 AS
653-1-11



4 EA
FTP-68B-06



2 EA
FTP-68B-06



2 EA
FTP-68B-06

INTERNALLY ILLUMINATED STREET NAME SIGNS/ OVERHEAD STREET SIGNS

Ⓒ
1 EA
700-5-22

Ⓙ
1 EA
700-5-21

Ⓓ
1 EA
700-5-22

Ⓙ
1 EA
700-5-21

CONTROLLER TIMINGS

TIMING FUNCTION									
MOVEMENT NUMBER		1	2	3	4	5	6	7	8
DIRECTION		NL	ST	EL	WT	SL	NT	WL	ET
TIMING FUNCTION	MINIMUM GREEN	-	-	-	-	-	-	-	-
	EXTENSION	-	-	-	-	-	-	-	-
	MAXIMUM GREEN 1	-	-	-	-	-	-	-	-
	MAXIMUM GREEN 2	-	-	-	-	-	-	-	-
	YELLOW CLEARANCE	-	-	-	-	-	-	-	-
	ALL RED	-	-	-	-	-	-	-	-
	PEDESTRIAN WALK	-	-	-	-	-	-	-	-
	PED. CLEARANCE	-	-	-	-	-	-	-	-
	RECALL	-	*	-	-	-	*	-	-

* - MIN/MAX RECALL ON

VIDEO DETECTOR CONFIGURATION CHART

VIDEO DETECTOR	DETECTION ZONE	MOVEMENT
VD-2	V-2	2
	V-5	5
VD-4	V-7	7
	V-4	4
VD-6	V-1	1
	V-6	6
VD-8	V-8	8
	V-3	3

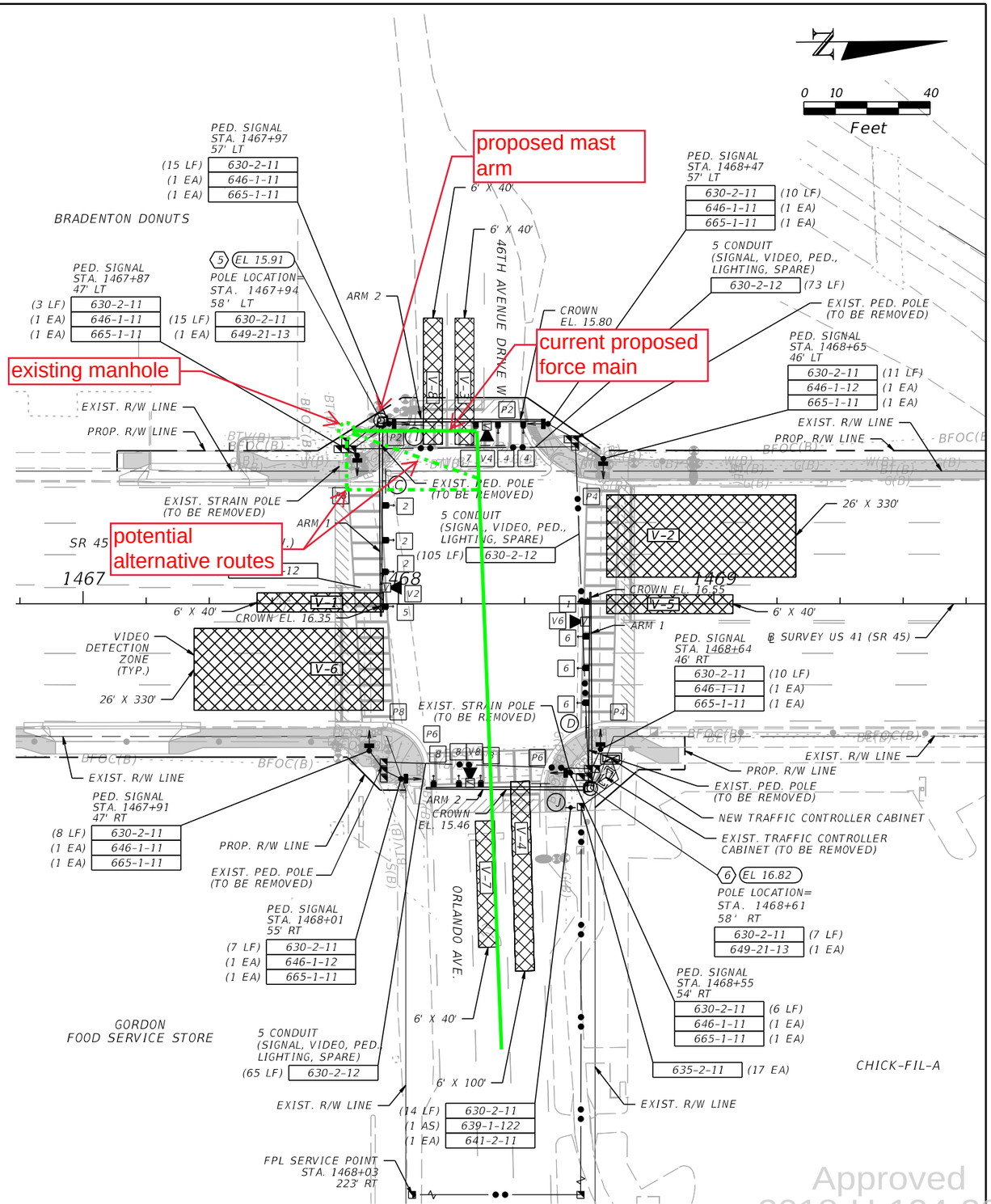
NOTES:
1. MAJOR STREET IS SR 45 (US 41 / 14TH STREET W.)
   MINOR STREET IS 46TH AVENUE DRIVE W. / ORLANDO AVE.
2. EXIST. SOP AND CONTROLLER TIMING TO REMAIN.
3. FLASHING OPERATION: YELLOW MOVEMENTS - 2, 6
   RED MOVEMENTS - ALL OTHERS
4. POSTED SPEED ON SR 45 (US 41 / 14TH ST. W.) - 45 MPH
   POSTED SPEED ON 46TH AVENUE DRIVE W. / ORLANDO AVE. - 25 MPH

TRAFFIC CONTROLLER CABINET ITEMS

632-7-1	(1 PI)
639-2-1	(213 LF)
660-4-11	(1 EA)
671-2-11	(1 EA)

REMOVAL PAY ITEMS

641-2-70	(2 EA)
646-1-60	(4 EA)
671-2-60	(1 EA)



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STEPHEN D. WILLIAMS, P.E.
P.E. LICENSE NUMBER 82274
SCALAR CONSULTING GROUP INC.
4152 W. BLUE HERON BOULEVARD, SUITE 119
RIVIERA BEACH, FLORIDA 33404
CERTIFICATE OF AUTHORIZATION NO. 29560

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 45	MANATEE	433592-1-52-01

SIGNALIZATION PLANS

SHEET NO. T-7

USER: Maria Missena 8/9/2018 3:34:22 PM P:\2016\SP16D1001 (US 41 - 69th to Cortez)\43359215201\signals\PLANSG03.DGN

Florida Department of Environmental Protection

Southwest District Office
13051 North Telecom Parkway, Suite 101
Temple Terrace, Florida 33637-0926

July 27, 2017

PERMITTEE:
Sia Mollanazar, P.E., Deputy Director – Engineering Section
Manatee County Public Works
1022 26th Ave. East
Bradenton, FL 34208
Sia.Mollanazar@Mymanatee.org

PERMIT NUMBER:	CS41-0182063-189-DWC/CG
ISSUE DATE:	July 27, 2017
EXPIRATION DATE:	July 26, 2022
COUNTY:	Manatee
PROJECT NAME:	Orlando Avenue Force Main Replacement
WWTF NAME:	Manatee County Southwest Regional
FACILITY ID:	FLA012619

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

Dear Mr. Mollanazar,

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our Office received the Notice on July 25, 2017.

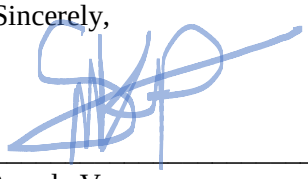
This is to advise you that the Department does not object to your use of this general permit for the following: ten-inch diameter force mains.

Please note the attached requirements apply to your use of this general permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation may subject the permittee to enforcement action and possible penalties.

If you have any questions, please contact Annemarie Hammond at 813-470-5908 or via email at Annemarie.Hammond@dep.state.fl.us.

Sincerely,



for Pamala Vazquez
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Copies furnished to:
W. Wade Wood, P.E., Kimley-Horn & Associates, Inc., Wade.Wood@kimley-horn.com
Kenneth Labarr, Manatee County Public Works Dept., Kenneth.Labarr@mymanatee.org
Jim Stockwell, P.E., Manatee County Public Works Dept., Jim.Stockwell@mymanatee.org
Annemarie Hammond, FDEP SWD, Annemarie.Hammond@dep.state.fl.us

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at: http://www.dep.state.fl.us/water/rulesprog.htm#ww *[62-4.540]*

2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. *[62-604.600(6)(b)1]*

3. This general permit cannot be revised, except to transfer the permit. *[62-604.600(6)(b)2]*

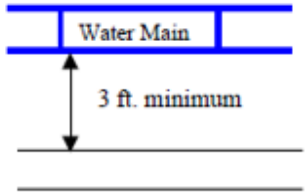
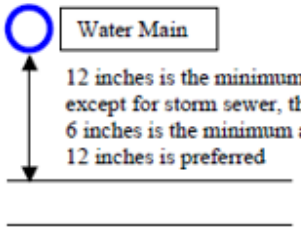
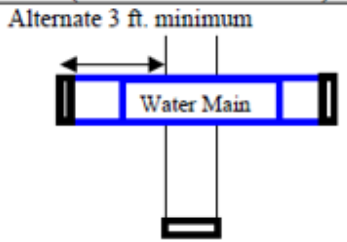
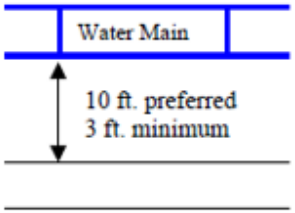
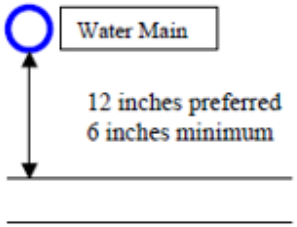
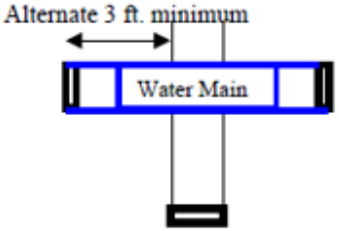
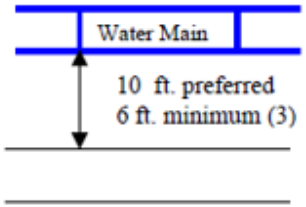
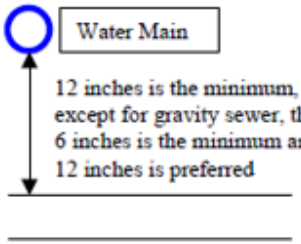
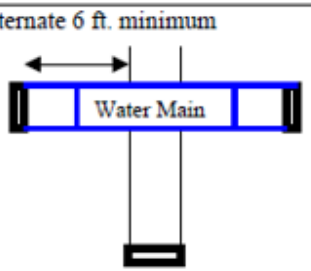
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. *[62-4.030]*

5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Southwest District Office Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: http://www.dep.state.fl.us/water/wastewater/forms.htm *[62-604.700(2)]*

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. *[62-604.700(3)]*

7. Abnormal events shall be reported to the Department's Southwest District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Southwest District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. *[62-604.550]*

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.
(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

APPENDIX B – GEOTECHNICAL REPORTS

Terracon GeoReport

Force Main 28A Replacement

Terracon Project No. HC165071

Prepared for:

Kimley-Horn and Associates, Inc.

Tampa, Florida

March 2, 2017

March 2, 2017

Terracon

Kimley-Horn and Associates, Inc.
655 North Franklin Street, Suite 150
Tampa, Florida 33602

Attn: Mr. Wade Wood III, P.E.
E: Wade.Wood@kimley-horn.com

Re: Proposed Geotechnical Engineering Services
Force Main 28A Replacement
Manatee County, Florida
Terracon Project No. HC165071

Dear Mr. Wood:

Terracon Consultants, Inc. (Terracon) is pleased to submit our Geotechnical Engineering Report for the above referenced project. This work was performed in accordance with our proposal number PHC165071 dated September 20, 2016. We trust that this report is responsive to your project needs. Please contact us if you have any questions or if we can be of further assistance.

We appreciate the opportunity to work with you on this project and look forward to providing additional Geotechnical Engineering and Construction Materials Testing services in the future.

Sincerely,
Terracon Consultants, Inc.

Sruthi Mantri, E.I.
Staff Engineer

JAMES M. JACKSON
LICENSE
No 77733
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

James M. Jackson, P.E.
Project Engineer
License No. 77733

3/2/17

REPORT TOPICS*

PROJECT DESCRIPTION

EXPECTED GEOTECHNICAL CONDITIONS

EXPLORATION AND TESTING PROCEDURES

GEOTECHNICAL MODEL

SEISMIC CONSIDERATIONS

GEOTECHNICAL OVERVIEW

RECOMMENDATIONS

GENERAL COMMENTS

ATTACHMENTS

- SITE LOCATION
- EXPLORATION PLAN
- EXPLORATION RESULTS (Boring Logs and Laboratory Data)
- SUPPORTING INFORMATION (General Notes and USCS, etc.)

***This is a paper rendition of a web-based Geotechnical Engineering Report.**

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed in the project planning stage. A period of collaboration has transpired since the project was initiated and our final understanding of the project conditions is as follows. Aspects of the project that are undefined or assumed at this point are highlighted as shown here in the following table.

Item	Description
Project location	57th Avenue West near the intersections of 24th Street West and 20th Street West in Bradenton, Manatee County, Florida (See **Exhibit 1: Site Location**)
Existing Improvements	Asphalt paved roadways with grassed shoulders
Proposed structure	The project will include replacement of the existing force main. We understand that approximately 1,900 lineal feet of 4 inch diameter PVC C900 DR 18 force main is to be installed by a combination of Horizontal Directional Drilling (HDD) to depths ranging from about 5 to 6 feet and cut-and-cover to depths ranging from about 4 to 5 feet.
Grading	We have assumed that site grades are to remain unchanged.
Estimated start of construction	November 2017

EXPECTED GEOTECHNICAL CONDITIONS

In order to develop a program of exploration that provides a geotechnical characterization sufficient for the planned construction we have developed an opinion of the geotechnical conditions expected. This opinion is based upon information available in the public domain as well as Terracon's historical records in the vicinity of the project site. This data review allows a prediction of the geotechnical conditions that will be encountered at the site, and it provides the understanding necessary to develop our scope of services for field exploration and laboratory testing. Our opinion is based upon this data alone, without the benefit of site-specific data. Therefore, the opinions stated in this section cannot be used for design, and must be confirmed with site-specific exploration.

Information Sources

Terracon has developed concepts for developing and managing subsurface characterization data, using GIS methods for the following information:

- Publically available information related to:
  - Topography – USGS Topographic Map for Bradenton, Florida, dated 1994
  - Soil Survey Maps – USDA Soil Survey of Manatee County, Florida, issued April 1983
  - Aerial Photographs (FDOT APLUS, UF PALMM, and Google Earth) – 1951, 1970, 1980, 1991, 1994, 1998, 2004, 2010, and 2016

- Terracon's Historic Information related to
  - Soil Borings (including laboratory test results)
  - Groundwater information
  - Geotechnical engineering reports

Expected Geotechnical Conditions

The results of our review of the above-listed data indicate that the site is relatively level and the shading on the USGS Topographic Map shows the site as built-up land (i.e. developed). The USDA Soil Survey shows the majority of the 24th Street West corridor is mapped with Soil Unit 6, *Broward Variant fine sand*, with the south being mapped with Soil Unit 38, *Palmetto sand.* Additionally, the survey indicates that the west half of the 20th Street West corridor is mapped with Soil Unit 13, *Chobee loamy fine sand*, and the east half is mapped with Soil Unit 50, *Wabasso fine sand*.

Unit 6, *Broward Variant fine sand*, is comprised of nearly level, poorly drained soil in flatwoods. The typical soil profile consists of fine sand to a depth of 34 inches, followed by **limestone** to a

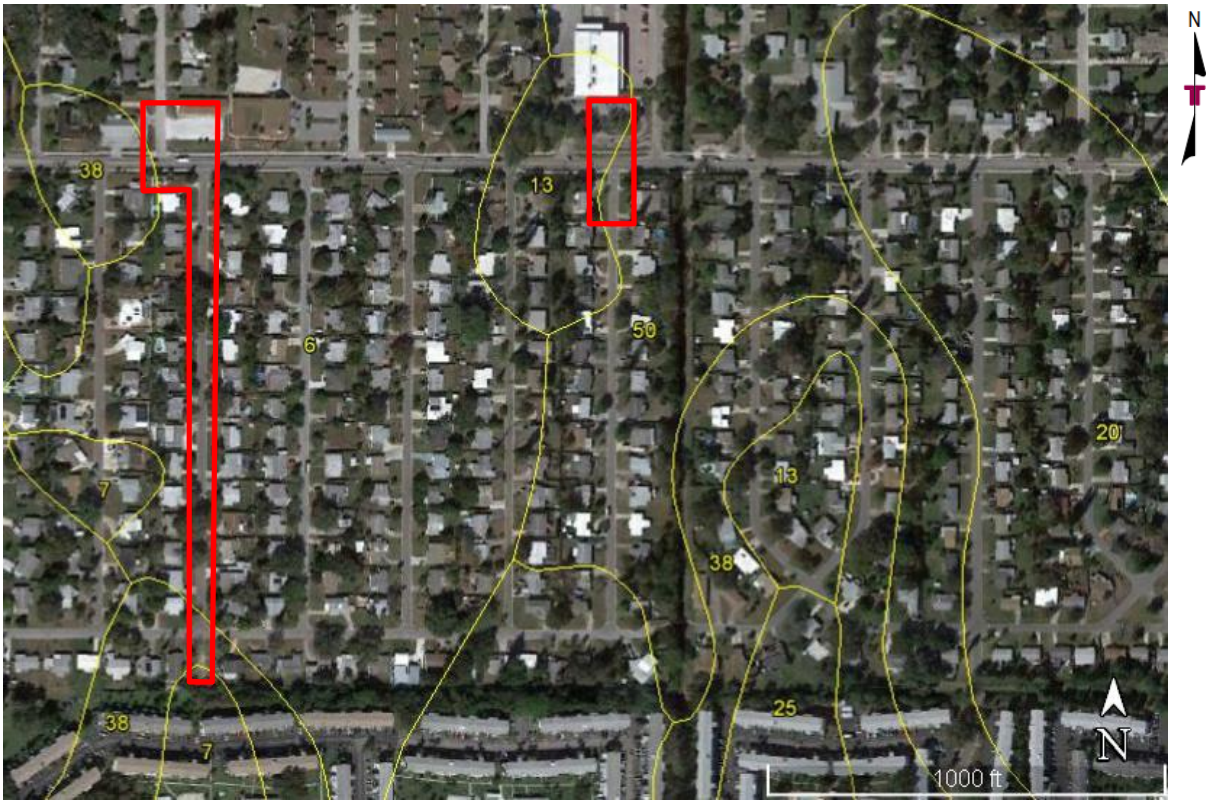
depth of 55 inches, and underlain by fine sand. Under natural (pre-development conditions, the Seasonal High Groundwater Table (SHGWT) is reported to lie at a depth of less than 10 inches for 1 to 4 months of the year.

Unit 13, *Chobee loamy fine sand*, is comprised of nearly level, very poorly drained soil that is in small to large depressions, poorly drained drainage ways, and on broad, low flats. The typical soil profile consists of loamy sand and sandy loam to a depth of 80 inches. Under natural (pre-development) conditions, the SHGWT is reported to lie at a depth of less than 10 inches for 6 to 9 months of the year.

Unit 38, *Palmetto sand*, is comprised of nearly level, poorly drained fine sand to a depth of 45 inches and underlain by sandy clay loam and sandy loam to a depth of 68 inches. Under natural (pre-development) conditions, the SHGWT is reported to lie at a depth of less than 10 inches bgs for 2 to 6 months of the year.

Unit 50, *Wabasso Variant fine sand*, is comprised of nearly-level, poorly-drained soil in areas of flatwoods. The typical soil profile consists of fine sand to a depth of 36 inches, followed by a **ledge of hard limestone** to a depth of 56 inches, and underlain by fine sand. Under natural (pre-development) conditions, the SHGWT is reported to lie at a depth of 10 to 40 inches for more than 5 months of the year.

The soil survey map is shown on the following page (Scale: 1” = 500’) and annotated to indicate areas with shallow limestone.



6 – Broward Variant fine sand
38 – Palmetto sand
13 – Chobee loamy fine sand
50 – Wabasso Variant fine sand
Areas (Broward and Wabasso) with shallow limestone.

Historical aerial photographs show the site as being undeveloped and covered with grassland and scattered trees until the early 1970s, when all of the existing roadways are in place. The surrounding residential and commercial structures are present by 1981, and the site remains relatively unchanged to the present day.

Additionally, based on Terracon's Historic Information for sites located approximately 1.8 miles north and 2 miles west of the site, we expect the borings to generally find loose to medium dense fine sands with varying amounts of silt to a depth of about 20 feet bgs and underlain by loose silty sand and medium stiff clay to a minimum depth of 30 feet bgs.

EXPLORATION AND TESTING PROCEDURES

Based on our understanding of the project as noted in **Project Understanding**, and as requested by you, we completed the following scope of services for field exploration and laboratory testing for this project.

Field Exploration

Our field exploration work included the drilling and sampling of exploratory soil borings consistent with the following schedule.

Number of Borings	Boring Depth (ft)	Planned Location
2	20	Force Main

Locations of soil borings are provided on our **Exploration Plan**. The locations were established in the field by Terracon's exploration team using a hand-held GPS unit. The accuracy of the exploration points is usually within 10 feet of the noted location. The ground surface elevations were estimated from the most recent USGS topographic maps, and the accuracy of the ground surface at each point is probably about 2 feet.

We advanced the soil borings with a track-mounted drill rig using a cutting head and stabilizing with the use of bentonite (drillers' mud). We obtained representative samples primarily by the split-barrel sampling procedure. In the split-barrel sampling procedure, a standard, 2-inch O.D., split-barrel sampling spoon is driven into the boring with a 140-pound rope-and-cathead operated SPT (Standard Penetration Test) hammer falling 30 inches. We recorded the number of blows required to advance the sampling spoon the last 12 inches of an 18-inch sampling interval as the standard penetration resistance value, N.

Our exploration team prepared field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and driller's interpretation of the subsurface conditions between samples. Groundwater observations were also recorded. The final boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in the laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned various laboratory tests to better understand the engineering properties of the various soil and rock strata as necessary for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216-10: Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422-63(2007)e2: Standard Test Method for Particle-Size Analysis of Soils

The laboratory testing program also included examination of soil samples by an engineer. Based on observation and laboratory test data, the engineer classified the soil samples in accordance with the Unified Soil Classification System (ASTM D2487).

GEOTECHNICAL MODEL

Subsurface conditions on the project site can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum	Material Description	Consistency/Density
1	20 feet	Poorly graded fine SAND with trace amounts of silt (SP, SP-SM)	Loose to dense

Conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in situ, the transition between materials may be gradual. Details for each of the borings can be found in **Exploration Results**. A discussion of field sampling and laboratory testing procedures and test results are presented in **Exploration and Testing Procedures**.

Groundwater

The boreholes were observed while drilling for the presence and level of groundwater. The water levels observed in the boreholes can be found in **Exploration Results**, and are summarized on the following page.

Boring number	Depth to groundwater while drilling, ft.
B-1	8
B-2	8

The groundwater measurements are influenced by the drilling process and ambient weather conditions which have been seasonably dry.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

SEISMIC CONSIDERATIONS

Florida is under the jurisdiction of its own building code as opposed to the International Building Code. Florida is generally regarded to be in a zone of low seismic risk. Therefore, we do not consider seismic effects to be a concern at this site.

GEOTECHNICAL OVERVIEW

In general, the borings found fine sands with trace to slight amounts of silt from the surface to the maximum borehole termination depth of 20 feet bgs. These materials are generally suitable for construction of the proposed structures following the **Recommendations** section of this report.

We recommend that Terracon be retained to evaluate the satisfactory preparation of the bearing material for the foundations, and floor slab subgrade soil.

RECOMMENDATIONS

General Overview

The contractor should anticipate saturated, loose, fine-grained sands which are prone to instability during excavation or HDD operations. However, possible areas with shallow, hard limestone could be encountered as indicated by the SCS mapping.

Lateral Earth Pressure Parameters

The soil parameters shown in the table below, based on an empirical correlation (ref: Florida Department of Transportation Soils and Foundations Handbook, 2017) with SPT blow counts (N-Values), should be assumed for the planning of HDD operations in the vicinity of the SPT borings.

Stratum	USCS Classification	SPT N-Values	Total Weight (pcf)	Submerged Weight (pcf)	Friction Angle (phi)	Cohesion (psf)	Coefficients		
							Active (Ka)	Passive (Kp)	At-Rest (K_0)
1, 2	SP, SP-SM	5 to 10	105	42.6	29	0	0.347	2.88	0.515
1, 2	SP, SP-SM	14 to 18	110	47.6	31	0	0.320	3.12	0.485
1, 2	SP, SP-SM	23 to 25	115	52.6	33	0	0.295	3.39	0.455
1, 2	SP, SP-SM	30 to 48	120	57.6	36	0	0.260	3.85	0.412

Estimated shear modulus values based on depth are also provided in the table below.

Boring No.	Depth (feet)	U.S.C.S.	Relative Density	Shear Modulus, G (psf)	
				Range	Average
B-1	0 - 8	SP	Loose	100,000 – 144,000	122,000
	8 – 20	SP-SM	Medium Dense to Dense	212,000 – 482,000	333,000
B-2	0 – 8	SP-SM	Loose to Medium Dense	100,000 – 222,000	161,000
	8 – 10	SP-SM	Dense	315,000	315,000
	10 – 20	SP-SM	Loose to Medium Dense	142,000 – 202,000	177,000

In estimating the shear modulus values, an empirical formula (Coduto, 2001) was used to relate the elastic modulus to both the N-value and soil type. Based on the granular nature of the site

soils, we assumed drained conditions and assigned Poisson's ratios of 0.1 for loose soils, 0.2 for medium dense soils, and 0.3 for dense soils (Rowe, 2000).

Pipe Installation Recommendations

- Any open trench (excavation) areas for placing and backfilling the pipe should be accomplished in the dry (i.e. not in saturated or submerged conditions). Dewatering to a depth of 2 feet below the bottom of all pipes should be performed prior to placement of bedding and backfill materials.
- Muck, or other organics, encountered in excavations should be removed in their entirety from beneath the pipe and for a minimum lateral distance of 5 feet from pipe/structure edges.
- Should the pipe trench bottom become unstable due to persistent moisture, hydrostatic pressure, or if organics are encountered, the bottom should be over-excavated a minimum of 12 inches (deep) and replaced with clean gravel (FDOT No. 57 Stone).
- Pipe backfill below the existing water level at the time of construction should consist of relatively clean sands or gravels, with a maximum of 15% passing the U.S. No. 200 sieve and no particle size larger than 1 inch in any dimension. Pipe backfill above the existing water level at the time of construction should consist of sands or gravels with particle sizes of less than 1 inch in any dimension, no more than 35 percent fines, and non-plastic (i.e. liquid limit less than 40 and plasticity index less than 10). The fill should be placed in the dry in lifts that do not exceed 12 inches in vertical measure. Each lift should be compacted to at least 95% of the Modified Proctor maximum dry density (ASTM D-1557). Backfill in pavement areas should be compacted to at least 98% density (ASTM D-1557).
- The soils encountered should generally meet the backfill gradation requirements of a maximum of 15% passing the U.S. No. 200. It should be noted that the encountered soils will be difficult to handle, place, and compact at moisture contents greater than +/- 2% of the optimum moisture content as determined from a Modified Proctor test.
- If pipe is to be installed beneath pavements, the pipe manufacturer's specifications for minimum depth of cover for the pipe should be consulted as applicable for pipe installed in SP, SP-SM, or SM (USCS soil classification) or A-3 and A-2-4 (AASHTO classification) soils compacted to 98% maximum dry density as determined by a Modified Proctor test.
- As a minimum, all temporary excavations should be sloped or braced as required by Occupational Health and Safety Administration (OSHA) regulations to provide stability and safe working conditions. Temporary excavations will probably be required during pipe installation operations. The utility contractor, by contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations including the current OSHA Excavation and Trench safety Standards.

Temporary Dewatering

Dewatering will be needed to facilitate earthwork and underground construction operations for this project. The necessity for dewatering will be dependent on the depth of excavation below existing grade and the groundwater levels at the time of construction. Actual dewatering means and methods should be left up to a contractor experienced in installation and operation of dewatering systems. The contractor should provide a dewatering plan for review and approval by the engineer prior to the installation of the dewatering systems.

Also, the dewatering plan should consider the potential impact of lowered groundwater (i.e. increased vertical stress on subsoils) on nearby, existing construction.

GENERAL COMMENTS

Our work is conducted with the understanding of the project as described in the proposal, and will incorporate collaboration with the design team prior to completing our services. Terracon has requested verification of all stated assumptions. Revision of our understanding to reflect actual conditions important to our work will be based on these verifications and will be reflected in the final report. The design team should collaborate with Terracon to confirm these assumptions. The design team should also collaborate with Terracon to prepare the final design plans and specifications. This facilitates the incorporation of our opinions related to implementation of our geotechnical recommendations.

Our analysis and opinions are based upon our understanding of the geotechnical conditions in the area, the data obtained from the site exploration performed and from our understanding of the project. Variations will occur between exploration point locations, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. So, Terracon should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

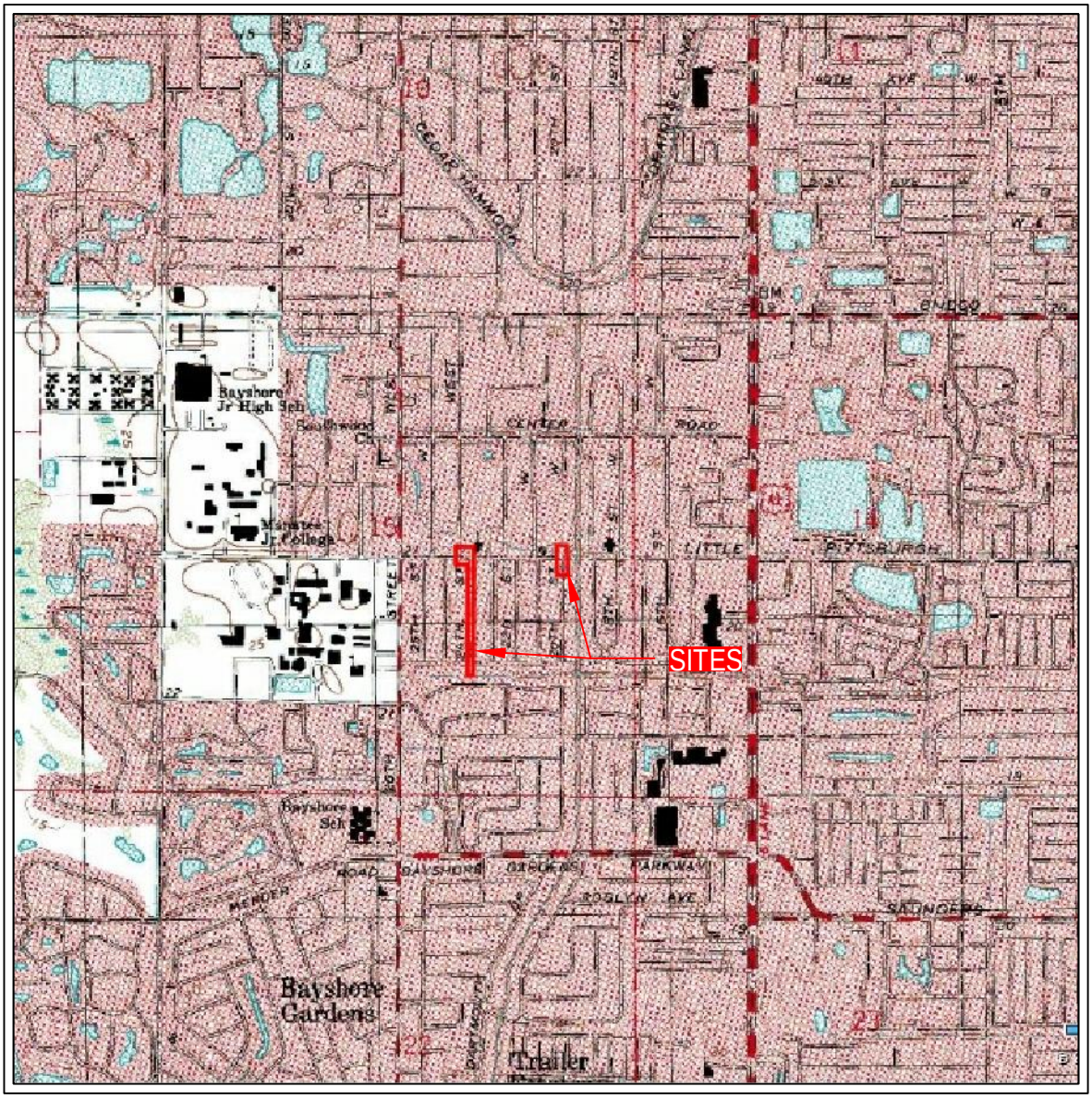
Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, and bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for that specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. In the event that changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be

considered valid unless we review the changes and either verify or modify our conclusions in writing.

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24 000

1 .5 0 KILOMETERS 1 2

1000 0 METERS 1000 2000

1 .5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL: 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

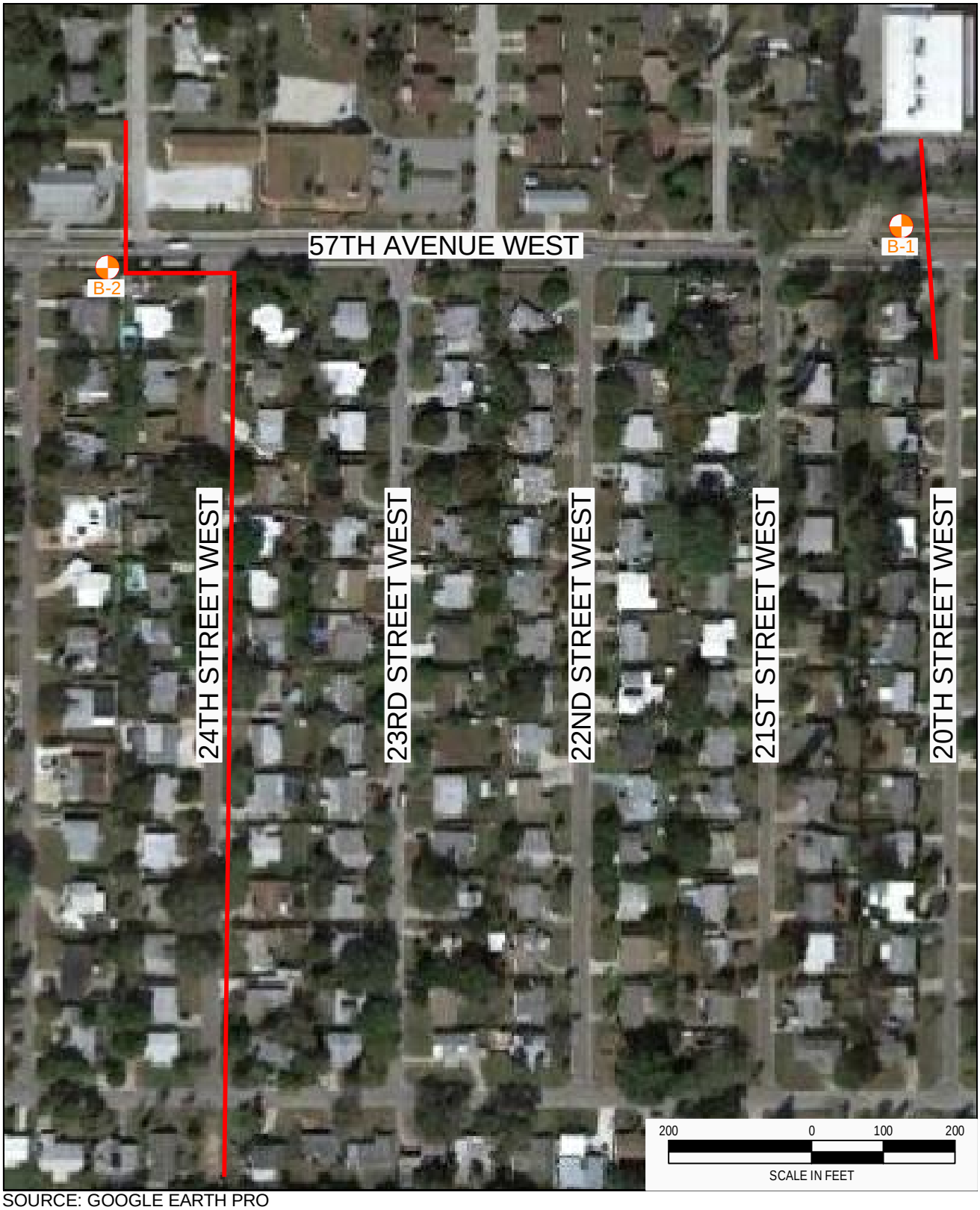
BRADENTON, FL

1994

7.5 MINUTE SERIES (TOPOGRAPHIC)

Project Mngr: JJ	Project No. HC165071	Terracon Consulting Engineers and Scientists	SITE LOCATION
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT
Checked By: JJ	File No. HC165071-1	PH. (941) 379-0621 FAX. (941) 379-5061	FORCE MAIN 28A REPLACEMENT
Approved By: DD	Date: 2-9-17		57TH AVENUE WEST AT 24TH STREET WEST AND 20TH STREET WEST
			MANATEE COUNTY, FLORIDA

EXHIBIT 1



SOURCE: GOOGLE EARTH PRO

LEGEND

B-1 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

APPROXIMATE ALIGNMENT OF FORCE MAIN REPLACEMENT

Project Mngr: JJ	Project No. HC165071	Terracon Consulting Engineers and Scientists	EXPLORATION PLAN
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT
Checked By: JJ	File No. HC165071-2	PH. (941) 379-0621 FAX. (941) 379-5061	FORCE MAIN 28A REPLACEMENT
Approved By: DD	Date: 2-9-17		57TH AVENUE WEST AT 24TH STREET WEST AND 20TH STREET WEST
			MANATEE COUNTY, FLORIDA

EXHIBIT 2

BORING LOG NO. B-1

PROJECT: Force Main 28A Replacement

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, FL

SITE: 57th Avenue West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.4404° Longitude: -82.5821°

DEPTH	GRAPHIC LOG	DESCRIPTION	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	PERCENT FINES
0		**POORLY GRADED SAND (SP)**, trace gravel, gray and borwn, loose					
5					2-2-3-4 N=5	8	4
					5-3-6-10 N=9		
8.0			▽				
		POORLY GRADED SAND WITH SILT (SP-SM), with shell fragments, gray and brown, medium dense to dense			4-9-16-20 N=25		
10					10-13-10-14 N=23		
					10-14-25-33 N=39		
15					4-4-13-26 N=17		
					21-23-25-35 N=48		
20					12-15-18-20 N=33	19	5
20.0		***Boring Terminated at 20 Feet***					

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand auger to 4', then Mud Rotary Drilling

Abandonment Method:
Boring backfilled with grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8 feet while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 1/31/2017 Boring Completed: 1/31/2017

Drill Rig: BR2500 Driller: JM

Project No.: HC165071

BORING LOG NO. B-2

PROJECT: Force Main 28A Replacement

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, FL

SITE: 57th Avenue West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.4403° Longitude: -82.5857°

DEPTH	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	PERCENT FINES
	POORLY GRADED SAND WITH SILT (SP-SM), with shell fragments, gray and brown, loose to dense						
						14	6
		5			3-2-3-3 N=5		
			▽		7-6-12-21 N=18		
					6-14-16-18 N=30		
		10			3-3-3-6 N=6		
					6-7-7-6 N=14		
		15			4-4-6-8 N=10		
					6-8-8-7 N=16		
20.0					7-9-7-8 N=16	21	5
	Boring Terminated at 20 Feet	20					

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand auger to 4', then Mud Rotary Drilling

Abandonment Method:
Boring backfilled with grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8 feet while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 1/31/2017 Boring Completed: 1/31/2017

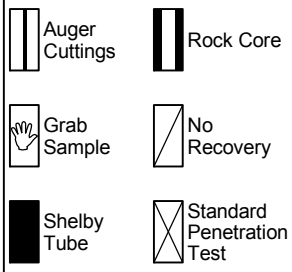
Drill Rig: BR2500 Driller: JM

Project No.: HC165071

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (psf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 500	0 - 1
Loose	4 - 9	Soft	500 to 1,000	2 - 4
Medium Dense	10 - 29	Medium Stiff	1,000 to 2,000	4 - 8
Dense	30 - 50	Stiff	2,000 to 4,000	8 - 15
Very Dense	> 50	Very Stiff	4,000 to 8,000	15 - 30
		Hard	> 8,000	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

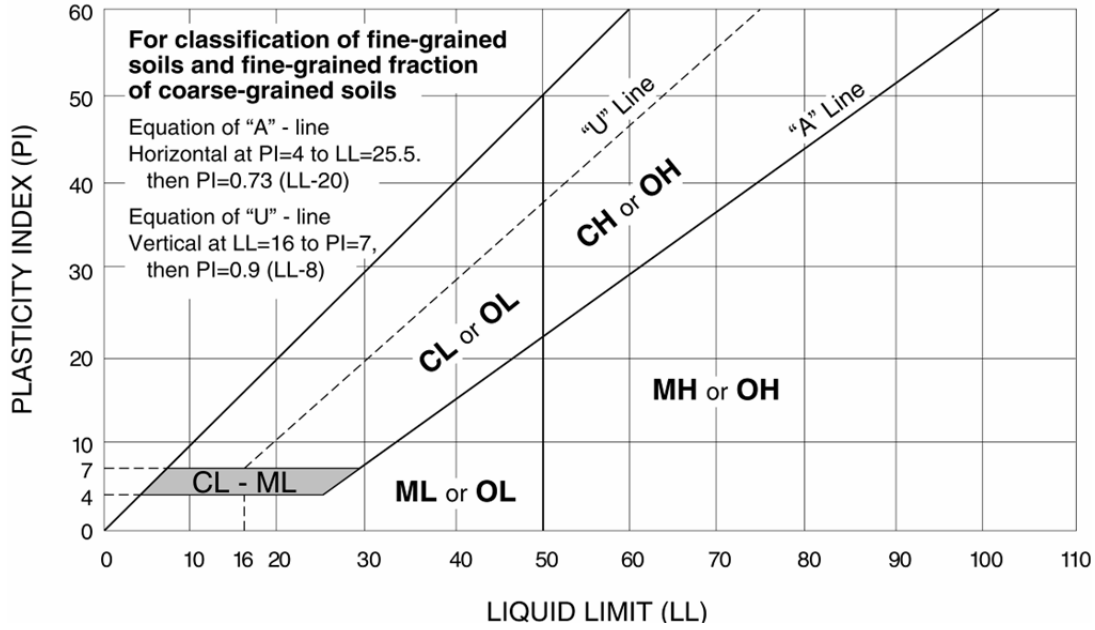
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Exhibit C-2

Terracon GeoReport

Port Manatee Force Main Replacement

Terracon Project No. HC165072

Prepared for:

Kimley-Horn and Associates, Inc.

Tampa, Florida

March 16, 2017

March 16, 2017

Terracon

Kimley-Horn and Associates, Inc.
655 North Franklin Street, Suite 150
Tampa, Florida 33602

Attn: Mr. Wade Wood III, P.E.
E: Wade.Wood@kimley-horn.com

Re: Proposed Geotechnical Engineering Services
Port Manatee Force Main Replacement
Manatee County, Florida
Terracon Project No. HC165072

Dear Mr. Wood:

Terracon Consultants, Inc. (Terracon) is pleased to submit our Geotechnical Engineering Report for the above referenced project. This work was performed in accordance with our proposal number PHC165072 dated September 20, 2016. We trust that this report is responsive to your project needs. Please contact us if you have any questions or if we can be of further assistance.

We appreciate the opportunity to work with you on this project and look forward to providing additional Geotechnical Engineering and Construction Materials Testing services in the future.

Sincerely,
Terracon Consultants, Inc.

Sruthi Mantri, E.I.
Staff Engineer

JAMES M. JACKSON LICENSED No 77733 STATE OF FLORIDA PROFESSIONAL ENGINEER

James M. Jackson, P.E.
Geotechnical Department Manager
FL License No 77733

3/16/17

REPORT TOPICS*

PROJECT DESCRIPTION

EXPECTED GEOTECHNICAL CONDITIONS

EXPLORATION AND TESTING PROCEDURES

GEOTECHNICAL MODEL

SEISMIC CONSIDERATIONS

GEOTECHNICAL OVERVIEW

RECOMMENDATIONS

GENERAL COMMENTS

ATTACHMENTS

- SITE LOCATION
- EXPLORATION PLAN
- EXPLORATION RESULTS (Boring Logs and Laboratory Data)
- SUPPORTING INFORMATION (General Notes and USCS, etc.)

***This is a paper rendition of a web-based Geotechnical Engineering Report.**

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed in the project planning stage. A period of collaboration has transpired since the project was initiated and our final understanding of the project conditions is as follows. Aspects of the project that are undefined or assumed at this point are highlighted as shown here in the following table.

Item	Description
Project location	Regal Cruise Way and Eastern Avenue in Palmetto, Manatee County, Florida (See **Exhibit 1: Site Location**)
Existing Improvements	Asphalt paved roadways
Proposed structure	The project will include replacement of the existing force main. We understand that a 4-inch diameter PVC C900 DR18 force main is to be installed for a length of 2,000 lineal feet by cut-and-cover. The planned depths of the piping will be approximately 4 to 5 feet below the existing ground surface.
Grading	We have assumed that site grades are to remain unchanged.
Estimated start of construction	November 2017

EXPECTED GEOTECHNICAL CONDITIONS

In order to develop a program of exploration that provides a geotechnical characterization sufficient for the planned construction we have developed an opinion of the geotechnical conditions expected. This opinion is based upon information available in the public domain as well as Terracon's historical records in the vicinity of the project site. This data review allows a prediction of the geotechnical conditions that will be encountered at the site, and it provides the understanding necessary to develop our scope of services for field exploration and laboratory testing. Our opinion is based upon this data alone, without the benefit of site-specific data. Therefore, the opinions stated in this section cannot be used for design, and must be confirmed with site-specific exploration.

Information Sources

Terracon has developed concepts for developing and managing subsurface characterization data, using GIS methods for the following information:

- Publically available information related to:
  - Topography – USGS Topographic Map for Cockroach Bay, Florida, dated 1981
  - Soil Survey Maps – USDA Soil Survey of Manatee County, Florida, issued April 1983
  - Aerial Photographs (FDOT APLUS, UF PALMM, and Google Earth)– 1938, 1948, 1957, 1967, 1973, 1984, 1991, 1994, 1998, 2002, 2007, 2012, and 2016

- Terracon's Historic Information related to
  - Soil Borings (including laboratory test results)
  - Groundwater information
  - Geotechnical engineering reports

Expected Geotechnical Conditions

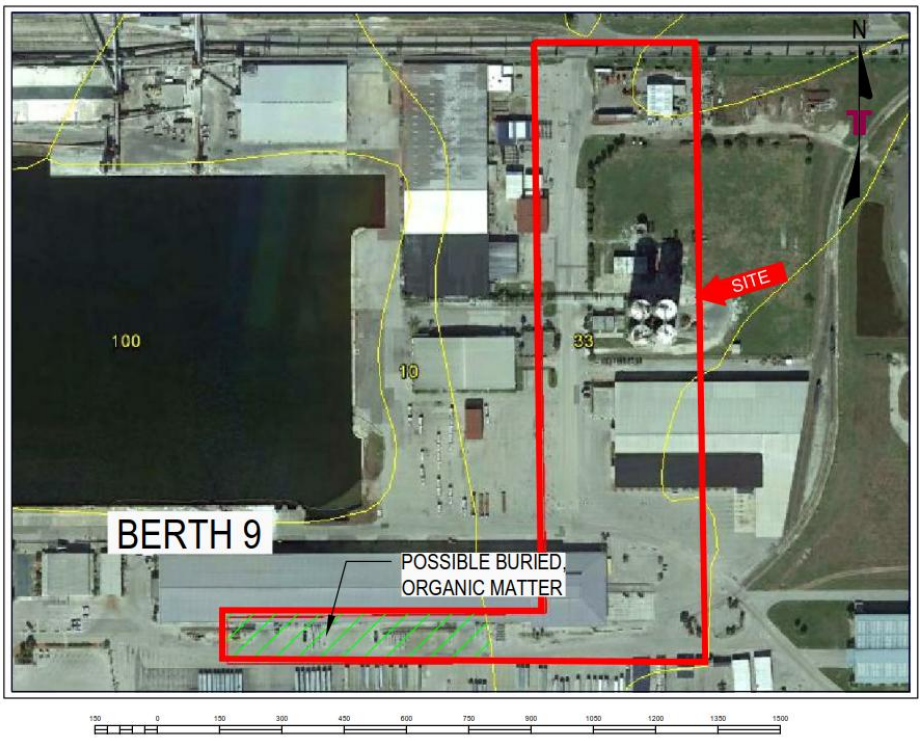
The results of our review of the above-listed data indicate that the site is relatively level and the shading on the USGS Topographic Map shows that site as built-up land (i.e. developed). The USDA Soil Survey shows the majority of the being site mapped with Soil Unit 33, *Myakka fine sand, tidal* with the southwest end of the site being mapped with Soil Unit 10, *Canaveral fine sand, organic substratum.*

Unit 33, *Myakka fine sand, tidal*, is comprised of nearly level, very poorly drained soil in high-lying tidal marshes between mangrove swamps and better drained upland soils. The typical soil profile consists of fine sand to a depth of 75 inches or more. Under natural (pre-development) conditions,

the Seasonal High Groundwater Table (SHGWT) is reported to lie at a depth of less than 10 inches below the existing surface (bgs) for most of the year and fluctuates with the tide.

Unit 10, Canaveral sand, organic substratum, is comprised of nearly level, moderately well drained to somewhat poorly drained soil consisting of sand and shells overlying **organic** material. The sand and shells have been dredged or excavated from water areas and deposited on tidal swamps or marshes. The fill material ranges from about 40 to 70 inches in thickness and is about 10 to 80 percent shells. The sand is fine to coarse with some lenses of clayey or loamy material. A layer of **muck** is generally found beneath the fill material. In most areas, this soil group is artificially drained with a SHGWT at a depth of about 30 to 60 inches. The SHGWT is dependent on the thickness of the fill material.

The soil survey map is shown on below (Scale: 1" = 500').



10 – Canaveral fine sand, organic substratum
33 – Myakka fine sand, tidal

Historical aerial photographs show the site as being undeveloped and covered with mangrove marsh until 1973, when the surrounding berths and Eastern Avenue first appear to be in place. Regal Cruise Way is apparent by 1987 and all of the surrounding structures are in place by 2002. The site remains generally unchanged from 2002 to the present day.

Based on Terracon's Historic Information for the adjacent Berth 9 rehabilitation project, we expect the proposed pipeline alignment to be underlain generally by fine sands with clay, silt and gravel

from the bottom of the asphalt pavement to depths of about 20 to 30 feet followed by very stiff silt and clay with seams of fine sand to a depth of about 100 feet below the existing ground surface (bgs). The ground surface elevation of this site ranges from approximately +7 ½ to +9 ½ feet-NAVD88 and the groundwater level, which is tidally influenced, is typically found at a depth ranging from about 7 and 9 feet bgs (0 to +½ feet-NAVD88) .

Additionally, during recent construction activity at Berth 9, which involved directional drilling soil anchors behind the bulkhead, 2 to 5-foot thick seams of very hard rock (chert) were found at depths ranging from about 15 to 25 feet bgs.

EXPLORATION AND TESTING PROCEDURES

Based on our understanding of the project as noted in **Project Understanding**, and as requested by you, we completed the following scope of services for field exploration and laboratory testing for this project.

Field Exploration

Our field exploration work included the drilling and sampling of exploratory soil borings consistent with the following schedule.

Number of Borings	Boring Depth (ft)	Planned Location
2	20	Force Main
3	10	Force Main

Locations of soil borings are provided on our **Exploration Plan**. The locations are limited to the planned HDD areas. The locations were established in the field by Terracon's exploration team using a hand-held GPS unit. The accuracy of the exploration points is usually within 10 feet of the noted location. The ground surface elevations were estimated from the most recent USGS topographic maps, and the accuracy of the ground surface at each point is probably about 2 feet.

We advanced the soil borings with a truck-mounted drill rig using a cutting head and stabilizing with the use of bentonite (drillers' mud). We obtained representative samples primarily by the split-barrel sampling procedure. In the split-barrel sampling procedure, a standard, 2-inch O.D., split-barrel sampling spoon is driven into the boring with a 140-pound automatic SPT (Standard Penetration Test) hammer falling 30 inches. We recorded the number of blows required to advance the sampling spoon the last 12 inches of an 18-inch sampling interval as the standard penetration resistance value, N.

Our exploration team prepared field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and driller's interpretation of the subsurface conditions between samples. Ground water observations were also recorded. The final boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in the laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned various laboratory tests to better understand the engineering properties of the various soil and rock strata as necessary for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216-10: Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422-63(2007)e2: Standard Test Method for Particle-Size Analysis of Soils
- ASTM D4318-10e1 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D2974-04: Standard Test Method for Organic Content

The laboratory testing program also included examination of soil samples by an engineer. Based on observation and test data, the engineer classified the soil samples in accordance with the Unified Soil Classification System (ASTM D2487).

GEOTECHNICAL MODEL

Subsurface conditions on the project site can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum	Material Description	Consistency/Density
P	3 to 3 ½ inches	Asphalt pavement	Not applicable
	6 inches	Sand-shell base course	
1	8 to 12 feet	Very silty SAND to sandy SILT (SM, ML)	Very loose to dense
2	6 feet	Lean clay (CL)	Stiff to very stiff
3	10 to 20 feet	Poorly graded fine SAND (SP)	Very loose to medium dense
4[1]	10 feet	Organic SAND with silt (SP-SM)	Loose

1. Only found in Boring B-4 at a depth of about 8 to 10 feet bgs.

Conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in situ, the transition between materials may be gradual. Details for each of the borings can be found in **Exploration Results**. A discussion of field sampling and laboratory testing procedures and test results are presented in **Exploration and Testing Procedures**.

An organic content of 8.1% was laboratory measured for a sample of the Stratum 4 material. Generally, soils with an organic content greater than 5% are not suitable for pipe backfill or bedding.

Groundwater

The boreholes were observed while drilling for the presence and level of groundwater. The water levels observed in the boreholes can be found in **Exploration Results**, and are summarized below.

Boring number	Depth to groundwater while drilling, ft.
B-1	7
B-2	6
B-3	6 ½
B-4	8 ½
B-5	8

The groundwater measurements are influenced by the drilling process, daily tides in the nearby Tampa Bay, and ambient weather conditions which have been seasonably dry.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

SEISMIC CONSIDERATIONS

Florida is under the jurisdiction of its own building code as opposed to the International Building Code. Florida is generally regarded to be in a zone of low seismic risk. Therefore, we do not consider seismic effects to be a concern at this site.

GEOTECHNICAL OVERVIEW

Soil with an organic content of about 8% by weight was found in Boring B-5 at depths ranging from about 8 to 10 feet bgs. The organic sand is somewhat compressible, with more than normal risk of pipe and structure settlement, due to potential for organic decay and therefore should be removed if encountered during pipe installation.

In addition to the organic sand, the borings found sandy silt and lean clay with the planned pipeline installation depth. These soils are generally suitable for support of the force main pipe. However, they will not meet the recommended gradation requirements for pipe backfill.

We recommend that Terracon be retained to evaluate the satisfactory preparation of the bearing material, and other earthwork aspects, of the pipeline installation.

RECOMMENDATIONS

Lateral Earth Pressure Parameters

The soil parameters shown in the table below, based on an empirical correlation (ref: Florida Department of Transportation Soils and Foundations Handbook, 2017) with SPT blow counts (N-Values), should be assumed for the planning of any below grade operations in the vicinity of the SPT borings.

Stratum	USCS Classification	SPT N-Values	Total Weight (pcf)	Submerged Weight (pcf)	Friction Angle (phi)	Cohesion (psf)	Coefficients		
							Active (Ka)	Passive (Kp)	At-Rest (K_0)
1	SM, ML	3	100	38	23	0	0.438	2.28	0.609
1	SM	13-20	110	43	30	0	0.333	3.00	0.500
1	SM	21-26	115	48	31	0	0.320	3.12	0.485
1	SM	33	120	53	33	0	0.295	3.39	0.455
1	SM	44	125	53	34	0	0.283	3.54	0.441
2	CL	10-20	120	53	0	1,000	1.000	1.00	1.000
3	SP	2-4	100	38	28	0	0.361	2.77	0.531
3,4	SP, SP-SM	5-10	105	38	29	0	0.347	2.88	0.515
3	SP	21-27	115	53	33	0	0.295	3.39	0.455

Pipe Installation Recommendations

- Any open trench (excavation) areas for placing and backfilling the pipe should be accomplished in the dry (i.e. not in saturated or submerged conditions). Dewatering to a depth of 2 feet below the bottom of all pipes should be performed prior to placement of bedding and backfill materials.
- Muck, or other organics, encountered in excavations should be removed in their entirety from beneath the pipe and for a minimum lateral distance of 5 feet from pipe/structure edges.
- Should the pipe trench bottom become unstable due to persistent moisture, hydrostatic pressure, or if organics are encountered, the bottom should be over-excavated a minimum of 12 inches (deep) and replaced with clean gravel (FDOT No. 57 Stone).
- Pipe backfill below the existing water level at the time of construction should consist of relatively clean sands or gravels, with a maximum of 15% passing the U.S. No. 200 sieve and no particle size larger than 1 inch in any dimension. Pipe backfill above the existing water level at the time of construction should consist of sands or gravels with particle sizes

of less than 1 inch in any dimension, no more than 35 percent fines, and non-plastic (i.e. liquid limit less than 40 and plasticity index less than 10). The fill should be placed in the dry in lifts that do not exceed 12 inches in vertical measure. Each lift should be compacted to at least 95% of the Modified Proctor maximum dry density (ASTM D-1557). Backfill in pavement areas should be compacted to at least 98% density (ASTM D-1557).

- The soils encountered generally do not meet the backfill gradation requirements of a maximum of 35% passing the U.S. No. 200 and will need to be replaced with suitable backfill meeting the gradation requirements previously described.
- If pipe is to be installed beneath pavements, the pipe manufacturer's specifications for minimum depth of cover for the pipe should be consulted as applicable for pipe installed in SP, SP-SM, or SM (USCS soil classification) or A-3 and A-2-4 (AASHTO classification) soils compacted to 98% maximum dry density as determined by a Modified Proctor test.
- As a minimum, all temporary excavations should be sloped or braced as required by Occupational Health and Safety Administration (OSHA) regulations to provide stability and safe working conditions. Temporary excavations will probably be required during pipe installation operations. The utility contractor, by contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations including the current OSHA Excavation and Trench safety Standards.

Temporary Dewatering

Dewatering will be needed to facilitate earthwork and underground construction operations for this project. The necessity for dewatering will be dependent on the depth of excavation below existing grade and the groundwater levels at the time of construction. Actual dewatering means and methods should be left up to a contractor experienced in installation and operation of dewatering systems. The contractor should provide a dewatering plan for review and approval by the engineer prior to the installation of the dewatering systems.

Also, the dewatering plan should consider the potential impact of lowered groundwater (i.e. increased vertical stress on subsoils) on nearby, existing construction.

GENERAL COMMENTS

Our work is conducted with the understanding of the project as described in the proposal, and will incorporate collaboration with the design team prior to completing our services. Terracon has requested verification of all stated assumptions. Revision of our understanding to reflect actual conditions important to our work will be based on these verifications and will be reflected in the final report. The design team should collaborate with Terracon to confirm these assumptions. The design team should also collaborate with Terracon to prepare the final design plans and specifications. This facilitates the incorporation of our opinions related to implementation of our geotechnical recommendations.

Our analysis and opinions are based upon our understanding of the geotechnical conditions in the area, the data obtained from the site exploration performed and from our understanding of the project. Variations will occur between exploration point locations, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. So, Terracon should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

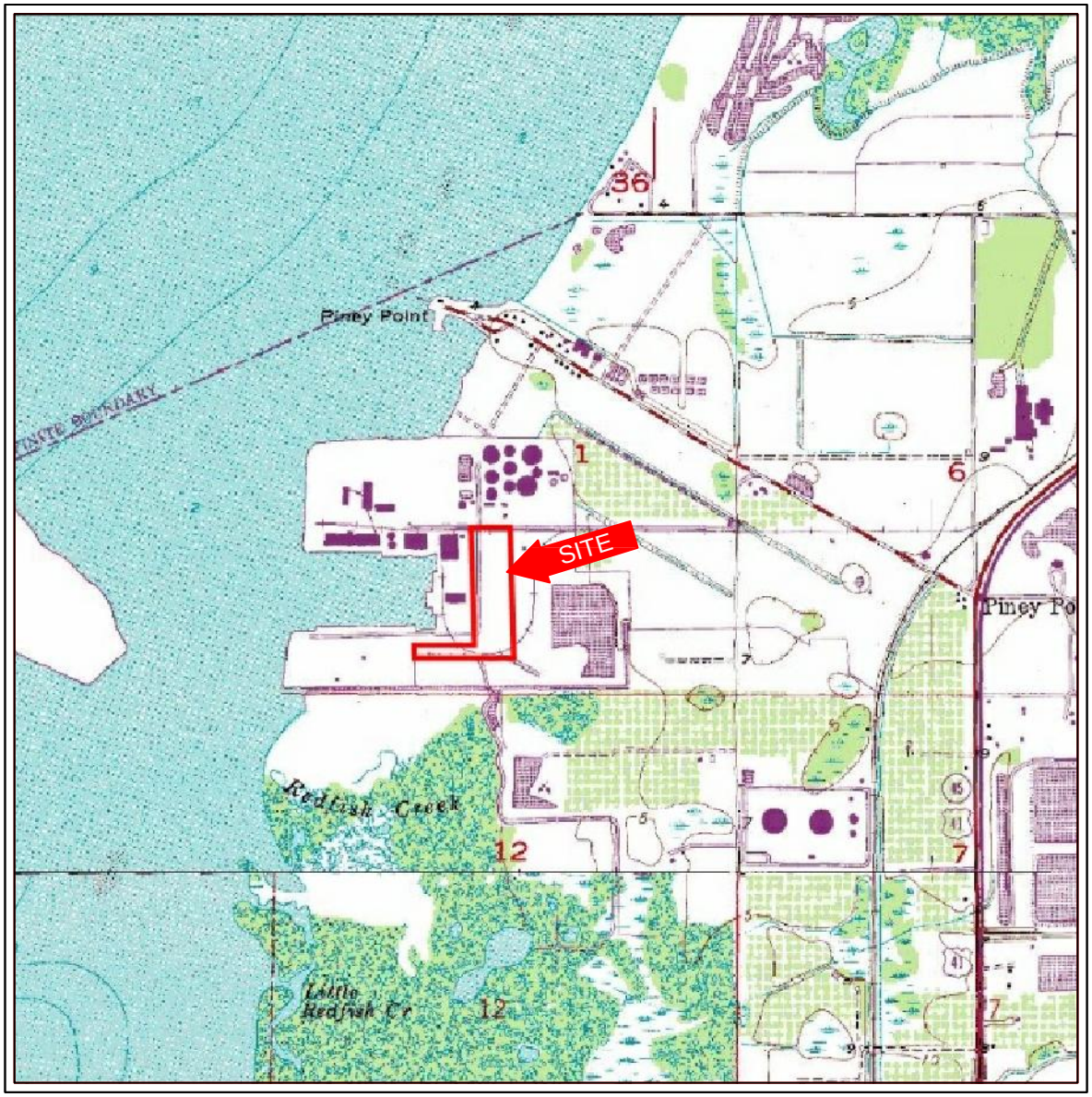
Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, and bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for that specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. In the event that changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be

considered valid unless we review the changes and either verify or modify our conclusions in writing.

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24 000

1 .5 0 KILOMETERS 1 2

1000 0 METERS 1000 2000

1 .5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL: 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

COCKROACH BAY, FL
1981
7.5 MINUTE SERIES (TOPOGRAPHIC)

Project Mngr: JJ	Project No. HC165072	Terracon Consulting Engineers and Scientists	SITE LOCATION
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT
Checked By: JJ	File No. HC165072-1	PH. (941) 379-0621 FAX. (941) 379-5061	PORT MANATEE FORCE MAIN REPLACEMENT
Approved By: DD	Date: 1-28-17		REGAL CRUISE WAY AND EASTERN AVENUE
			MANATEE COUNTY, FLORIDA

EXHIBIT 1

SOURCE: GOOGLE EARTH PRO

LEGEND

B-1 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

APPROXIMATE ALIGNMENT OF FORCE MAIN REPLACEMENT

APPROXIMATE ALIGNMENT OF FORCE MAIN TO REMAIN IN-PLACE

300 0 150 300

SCALE IN FEET

Project Mngr:	JJ
Drawn By:	DV
Checked By:	JJ
Approved By:	DD
Project No.	HC165072
Scale:	AS-SHOWN
File No.	HC165072-2
Date:	2-22-16

Terracon
Consulting Engineers and Scientists
8260 VICO COURT, UNIT B SARASOTA, FL 34240
PH. (941) 379-0621 FAX. (941) 379-5061

EXPLORATION PLAN

GEOTECHNICAL ENGINEERING REPORT

PORT MANATEE FORCE MAIN REPLACEMENT

REGAL CRUISE WAY AND EASTERN AVENUE

MANATEE COUNTY, FLORIDA

EXHIBIT 2

BORING LOG NO. B-1

PROJECT: Port Manatee Force Main Replacement

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Regal Cruise Way and Eastern Avenue
Palmetto, Florida

LOCATION See Exploration Plan

Latitude: 27.63558° Longitude: -82.55698°

GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT (%)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.8 **3" Asphalt, 6" Sand-shell base**								
	SANDY SILT (ML), trace shell, brown and gray, loose to medium dense				3-9-11-10 N=20				
		5			10-8-6-4 N=14				
			▽		2-2-1-1 N=3		51	25-23-2	77
	8.0 **POORLY GRADED SAND (SP)**, brown, loose				2-4-4-5 N=8				
	10.0 ***Boring Terminated at 10 Feet***	10							

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

Advancement Method:
Hand auger till 2', Mud Rotary Drilling - Below 2'

Abandonment Method:
Borings backfilled with cement grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 7' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/9/2017 Boring Completed: 2/9/2017

Drill Rig: BR-2500 Driller: JC

Project No.: HC165072

BORING LOG NO. B-2

PROJECT: Port Manatee Force Main Replacement

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Regal Cruise Way and Eastern Avenue
Palmetto, Florida

LOCATION See Exploration Plan

Latitude: 27.63489° Longitude: -82.55705°

GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT (%)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	3.5" Asphalt, 6" Sand-shell base								
	0.8 **LEAN CLAY (CL)**, trace shell and limestone, brown and gray, stiff to very stiff				5-5-6-6 N=11				
					4-4-6-6 N=10		31	28-20-8	57
		5	▽		10-8-12-11 N=20				
	6.0 **POORLY GRADED SAND (SP)**, brown and gray, medium dense				8-9-12-16 N=21				
					9-12-15-14 N=27				
	10.0 **POORLY GRADED SAND (SP)**, with limestone and shell, gray, loose	10			3-2-3-3 N=5				
					3-2-2-1 N=4				
		15			1-2-1-1 N=3				
					0-1-1-1 N=2				
	20.0				2-2-1-2 N=3				
	Boring Terminated at 20 Feet	20							

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

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Borings backfilled with cement grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 6' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/9/2017 Boring Completed: 2/9/2017

Drill Rig: BR-2500 Driller: JC

Project No.: HC165072

BORING LOG NO. B-3

PROJECT: Port Manatee Force Main Replacement

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Regal Cruise Way and Eastern Avenue
Palmetto, Florida

LOCATION See Exploration Plan

Latitude: 27.63347° Longitude: -82.55715°

GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT (%)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.8 **3" Asphalt, 6" Sand-shell Base**								
	SILTY SAND (SM), with shell and limestone, brown and gray, medium dense to dense				28-31-13-12 N=44				
					9-16-17-14 N=33				
	6.0	5			6-6-7-6 N=13		40		31
	POORLY GRADED SAND (SP), brown and gray, loose to medium dense		▽		5-3-3-4 N=6				
	10.0				5-6-4-2 N=10				
	Boring Terminated at 10 Feet	10							

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

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Borings backfilled with cement grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 6.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/9/2017 Boring Completed: 2/9/2017

Drill Rig: BR-2500 Driller: JC

Project No.: HC165072

BORING LOG NO. B-4

PROJECT: Port Manatee Force Main Replacement

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Regal Cruise Way and Eastern Avenue
Palmetto, Florida

LOCATION See Exploration Plan

Latitude: 27.63207° Longitude: -82.5588°

GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT (%)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SILTY SAND (SM), with limestone fragments, brown and gray, medium dense				39-12-10-11 N=22				
					9-9-9-14 N=18				
		5			8-10-11-12 N=21				
					11-10-9-4 N=19				
	8.0 **ORGANIC SAND with silt (SP-SM)**, dark brown, loose		▽		3-3-4-5 N=7	8.1	41		5
	10.0 ***Boring Terminated at 10 Feet***	10							

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

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Borings backfilled with cement grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/9/2017 Boring Completed: 2/9/2017

Drill Rig: BR-2500 Driller: JC

Project No.: HC165072

BORING LOG NO. B-5

PROJECT: Port Manatee Force Main Replacement

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Regal Cruise Way and Eastern Avenue
Palmetto, Florida

LOCATION See Exploration Plan

Latitude: 27.63206° Longitude: -82.55792°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT (%)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8		**3" Asphalt, 6" Sand-shell base**								
		SILTY SAND (SM), trace shell, trace cemented sand, brown and gray, very loose to medium dense				7-10-11-10 N=21				
						10-11-15-15 N=26				
			5			8-8-9-8 N=17		18		26
				▽		6-6-7-6 N=13				
						5-1-2-5 N=3				
12.0			10			7-9-8-34 N=17				
		POORLY GRADED SAND (SP), with limestone and shell, gray, very loose to medium dense				8-5-5-5 N=10				
			15			4-3-2-1 N=5				
						1-2-1-2 N=3				
						1-2-4-9 N=6				
20.0			20							
		Boring Terminated at 20 Feet								

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

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Borings backfilled with cement grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/9/2017 Boring Completed: 2/9/2017

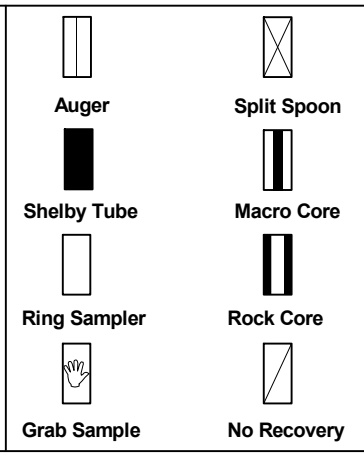
Drill Rig: BR-2500 Driller: JC

Project No.: HC165072

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, psf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42
			Hard	> 8,000	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

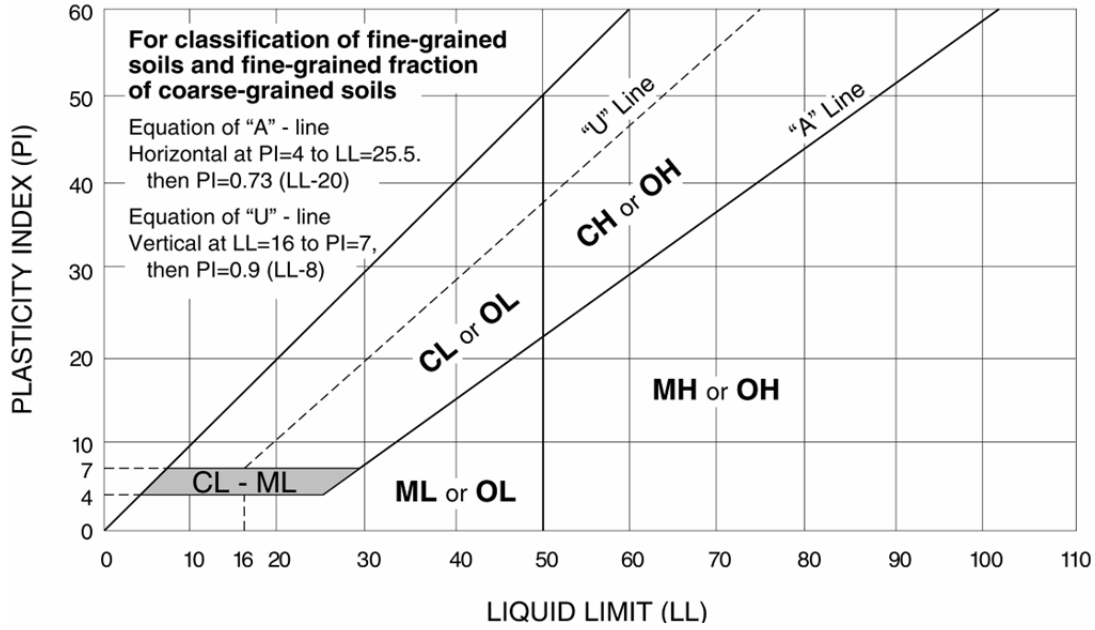
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



DESCRIPTION OF ROCK PROPERTIES

WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, PSI (MPa)**
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft (50 – 300 mm)
Moderate	8 in – 2 ft (200 – 600 mm)	**Medium**	1 ft – 3 ft (300 – 900 mm)
Wide	2 ft – 6 ft (600 mm – 2.0 m)	**Thick**	3 ft – 10 ft (900 mm – 3 m)
Very Wide	6 ft – 20 ft (2.0 – 6 m)	**Massive**	> 10 ft (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0 degree angle.

ROCK QUALITY DESIGNATION (RQD*)	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

*The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements

Terracon GeoReport

Orlando Avenue Force Main Replacement

Terracon Project No. HC165070

Prepared for:

Kimley-Horn and Associates, Inc.

Tampa, Florida

March 6, 2017

March 6, 2017

Terracon

Kimley-Horn and Associates, Inc.
655 North Franklin Street, Suite 150
Tampa, Florida 33602

Attn: Mr. Wade Wood III, P.E.
E: Wade.Wood@kimley-horn.com

Re: Proposed Geotechnical Engineering Services
Orlando Avenue Force Main Replacement
Manatee County, Florida
Terracon Project No. HC165070

Dear Mr. Wood:

Terracon Consultants, Inc. (Terracon) is pleased to submit our Geotechnical Engineering Report for the above referenced project. This work was performed in accordance with our proposal number PHC165070 dated September 20, 2016. We trust that this report is responsive to your project needs. Please contact us if you have any questions or if we can be of further assistance.

We appreciate the opportunity to work with you on this project and look forward to providing additional Geotechnical Engineering and Construction Materials Testing services in the future.

Sincerely,
Terracon Consultants, Inc.

Sruthi Mantri, E.I.
Staff Engineer

JAMES M. JACKSON LICENSE No 77733 STATE OF FLORIDA PROFESSIONAL ENGINEER

James M. Jackson, P.E.
Project Engineer
FL License No. 77733

3/6/17

REPORT TOPICS*

PROJECT DESCRIPTION

EXPECTED GEOTECHNICAL CONDITIONS

EXPLORATION AND TESTING PROCEDURES

GEOTECHNICAL MODEL

SEISMIC CONSIDERATIONS

GEOTECHNICAL OVERVIEW

RECOMMENDATIONS

GENERAL COMMENTS

ATTACHMENTS

- SITE LOCATION
- EXPLORATION PLAN
- EXPLORATION RESULTS (Boring Logs and Laboratory Data)
- SUPPORTING INFORMATION (General Notes and USCS, etc.)

***This is a paper rendition of a web-based Geotechnical Engineering Report.**

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed in the project planning stage. A period of collaboration has transpired since the project was initiated and our final understanding of the project conditions is as follows. Aspects of the project that are undefined or assumed at this point are highlighted as shown here in the following table.

Item	Description
Project location	The project is located along Orlando Avenue near the intersection of 14th Street West and at an entrance to a strip shopping center from 5th Street West in Bradenton, Manatee County, Florida (See **Exhibit 1: Site Location**)
Existing Improvements	Asphalt paved roadways with grassed shoulders
Proposed structure	The project will include replacement of the existing 10-inch diameter force main. We understand that approximately 2,500 lineal feet of 10-inch diameter PVC C900 DR 18 force main is to be installed by a combination of Horizontal Directional Drilling (HDD) to depths ranging from about 15 to 20 feet and cut-and-cover to depths ranging from about 4 to 5 feet.
Grading	We have assumed that site grades are to remain unchanged.
Estimated start of construction	November 2017

EXPECTED GEOTECHNICAL CONDITIONS

In order to develop a program of exploration that provides a geotechnical characterization sufficient for the planned construction we have developed an opinion of the geotechnical conditions expected. This opinion is based upon information available in the public domain as well as Terracon's historical records in the vicinity of the project site. This data review allows a prediction of the geotechnical conditions that will be encountered at the site, and it provides the understanding necessary to develop our scope of services for field exploration and laboratory testing. Our opinion is based upon this data alone, without the benefit of site-specific data. Therefore, the opinions stated in this section cannot be used for design, and must be confirmed with site-specific exploration.

Information Sources

Terracon has developed concepts for developing and managing subsurface characterization data, using GIS methods for the following information:

- Publically available information related to:
  - Topography – USGS Topographic Map for Bradenton, Florida, dated 1994
  - Soil Survey Maps – USDA Soil Survey of Manatee County, Florida, issued April 1983
  - Aerial Photographs (FDOT APLUS, UF PALMM, and Google Earth)– 1950, 1957, 1973, 1980, 1991 ,1994 ,1998 ,2003 ,2007 ,2012 , and 2016

- Terracon's Historic Information related to
  - Soil Borings (including laboratory test results)
  - Groundwater information
  - Geotechnical engineering reports

Expected Geotechnical Conditions

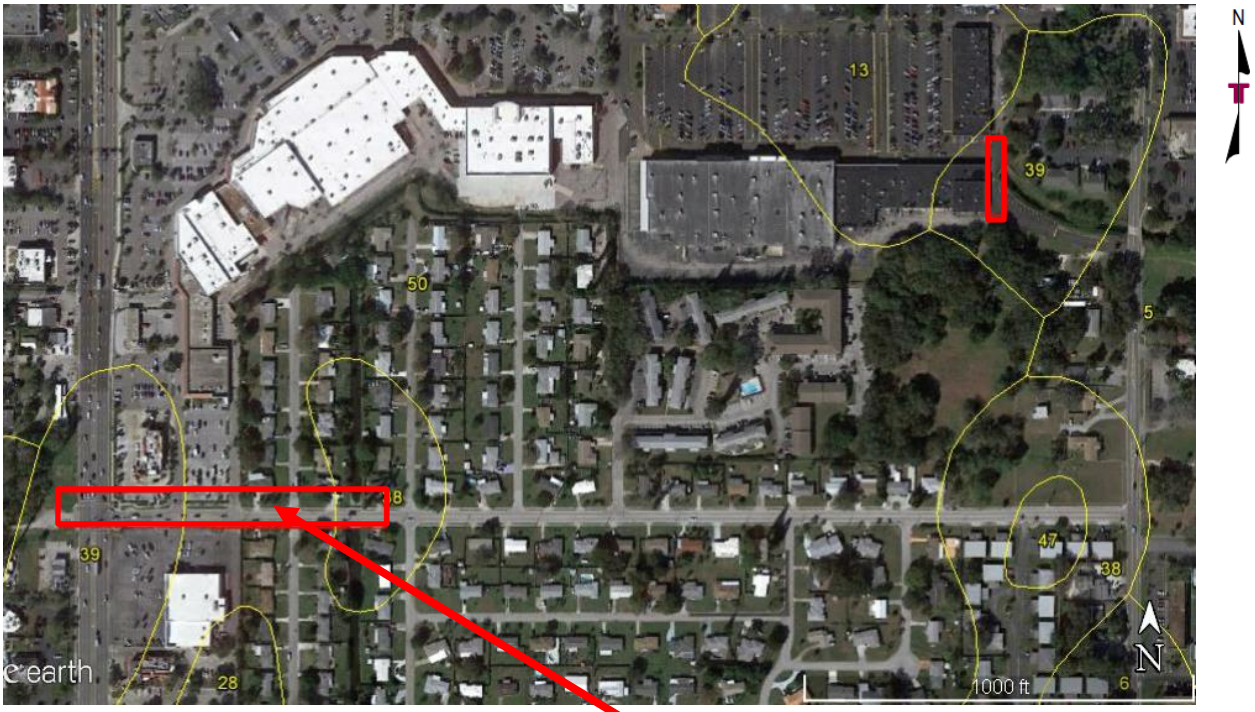
The results of our review of the above-listed data indicate that the site is relatively level and the shading on the USGS Topographic Map shows the site as built-up land (i.e. developed). The USDA Soil Survey shows the Orlando Avenue corridor being mapped with Soil Unit 39, *Parkwood Variant Complex* in the western third, Soil Unit 50, *Wabasso Variant fine sand* in the middle, and Soil Unit 38, *Palmetto fine sand* in the eastern third. Additionally, the survey indicates the portion of the site along 5th Street West is mapped with Soil Unit 38, *Palmetto fine sand*.

Unit 38, *Palmetto sand*, is comprised of nearly level, poorly drained fine sand to a depth of 45 inches and underlain by sandy clay loam and sandy loam to a depth of 68 inches. Under natural

(pre-development) conditions, the SHGWT is reported to lie at a depth of less than 10 inches bgs for 2 to 6 months of the year.

Unit 39, Parkwood variant complex, is comprised of nearly level, poorly drained and very poorly drained soils on cabbage palm hammocks, in drainage ways, and around the edges of ponds. The typical soil profile consists of loamy fine sand and sandy loam to a depth of 37 inches and underlain by soft **limestone** to a depth of 80 inches. Under natural (pre-development) conditions, the SHGWT is reported to lie at a depth of less than 10 inches bgs for 2 to 4 months of the year.

Unit 50, *Wabasso Variant fine sand*, is comprised of nearly-level, poorly-drained soil in areas of flatwoods. The typical soil profile consists of fine sand to a depth of 36 inches, followed by a **ledge of hard limestone** to a depth of 56 inches, and underlain by fine sand. Under natural (pre-development) conditions, the SHGWT is reported to lie at a depth of 10 to 40 inches for more than 5 months of the year. The soil survey map is shown below (Scale: 1" = 500').



38 – Palmetto sand
39 – Parkwood Variant complex
50 – Wabasso Variant fine sand

Historical aerial photographs show the sites as row crop farm land by 1950. Orlando Avenue portion of the site appears to be in place with surrounding residential structures by 1957 and the

portion of the site along 5th Street West appears to be cleared with all of the surrounding structures in place by 1973. The sites remain generally unchanged from 1973 to the present day.

Additionally, based on Terracon's Historic Information for a site located approximately 0.3 miles northeast of the sites, we expect the borings to find loose to medium dense fine sands to a depth of about 15 feet bgs and underlain by very stiff to hard clay to a minimum depth of 20 feet bgs.

EXPLORATION AND TESTING PROCEDURES

Based on our understanding of the project as noted in **Project Understanding**, and as requested by you, we completed the following scope of services for field exploration and laboratory testing for this project.

Field Exploration

Our field exploration work included the drilling and sampling of exploratory soil borings consistent with the following schedule.

Number of Borings	Boring Depth (ft)	Planned Location
6	40	Force Main

Locations of soil borings are provided on our **Exploration Plan**. The locations are limited to the planned HDD areas. The locations were established in the field by Terracon's exploration team using a hand-held GPS unit. The accuracy of the exploration points is usually within 10 feet of the noted location. The ground surface elevations were estimated from the most recent USGS topographic maps, and the accuracy of the ground surface at each point is probably about 2 feet.

We advanced the soil borings with a track-mounted drill rig using a cutting head and stabilizing with the use of bentonite (drillers' mud). We obtained representative samples primarily by the split-barrel sampling procedure. In the split-barrel sampling procedure, a standard, 2-inch O.D., split-barrel sampling spoon is driven into the boring with a 140-pound rope and cathead operated SPT (Standard Penetration Test) hammer falling 30 inches. We recorded the number of blows required to advance the sampling spoon the middle 12 inches of a 24-inch sampling interval as the standard penetration resistance value, N.

Our exploration team prepared field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and the driller's interpretation of the subsurface conditions between samples. Ground water observations were also recorded. The final boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in the laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned various laboratory tests to better understand the engineering properties of the various soil and rock strata as necessary for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216-10: Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422-63(2007)e2: Standard Test Method for Particle-Size Analysis of Soils
- ASTM D4318-10e1 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

The laboratory testing program also included examination of soil samples by an engineer. Based on observation and test data, the engineer classified the soil samples in accordance with the Unified Soil Classification System (ASTM D2487).

GEOTECHNICAL MODEL

Subsurface conditions on the project site can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum	Material Description	Consistency/Density
P	2 to 3 inches	Asphalt pavement	Not applicable
	6 to 8 inches	Sand-shell base course	
1	10 to 18 feet	Poorly graded SAND with varying amounts of silt (SP, SP-SM)	Loose to dense
2	14 to 18	Silty SAND (SM)	Medium dense to very dense
3	13½ to 40 feet	CLAY (CH)	Soft to hard
4	10 to 40 feet	LIMESTONE	Very hard

Conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in situ, the transition between materials may be gradual. Details for each of the borings can be found in **Exploration Results**. A discussion of field sampling and laboratory testing procedures and test results are presented in **Exploration and Testing Procedures**.

Groundwater

The boreholes were observed while drilling for the presence and level of groundwater. The water levels observed in the boreholes can be found in **Exploration Results**, and are summarized below.

Boring number	Depth to groundwater while drilling, ft.
B-1	3 ½
B-2	3 ½
B-3	7
B-4	4
B-5	Not encountered
B-6	Not encountered

The groundwater measurements are influenced by the drilling process and ambient weather conditions which have been seasonably dry.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

SEISMIC CONSIDERATIONS

Florida is under the jurisdiction of its own building code as opposed to the International Building Code. Florida is generally regarded to be in a zone of low seismic risk. Therefore, we do not consider seismic effects to be a concern at this site.

GEOTECHNICAL OVERVIEW

In general, the borings found fine sands with varying amounts of silt from the surface to a depth of about 18 feet underlain by clay and limestone to the maximum borehole termination depth of 40 feet bgs. These materials are generally suitable for construction of the proposed structures following the **Recommendations** section of this report.

We recommend that Terracon be retained to evaluate the satisfactory preparation of the bearing material, as well as other earthwork aspects, for the cut-and-cover pipeline installation.

RECOMMENDATIONS

General Overview

The contractor should anticipate the following subsoil conditions during HDD operations:

- Saturated, loose, fine-grained sands which are prone to instability during excavation or directional drilling.
- Very hard drilling at the locations and depths where SPT blow counts were 50 or more within a 6-inch interval sampling interval.

Lateral Earth Pressure Parameters

The soil parameters shown in the table below, based on an empirical correlation (ref: Florida Department of Transportation Soils and Foundations Handbook, 2017) with SPT blow counts (N-Values), should be assumed for the planning of HDD operations in the vicinity of the SPT borings.

Stratum	USCS Classification	SPT N-Values	Total Weight (pcf)	Submerged Weight (pcf)	Friction Angle (phi)	Cohesion (psf)	Coefficients		
							Active (Ka)	Passive (Kp)	At-Rest (K_0)
1	SP, SP-SM	2 to 4	100	38	28	0	0.361	2.77	0.531
1	SP, SP-SM	5 to 10	105	43	29	0	0.347	2.88	0.515
1	SP, SP-SM	12 to 18	110	48	31	0	0.320	3.12	0.485
1	SP, SP-SM	23 to 27	115	53	34	0	0.283	3.54	0.441
1	SP, SP-SM	35 to 55	120	58	37	0	0.249	4.02	0.398
2	SM	28	110	48	33	0	0.295	3.39	0.455
2	SM	50	115	53	35	0	0.271	3.69	0.426
3	CH	3 to 9	115	53	0	750	1.000	1.00	1.000
3	CH	12 to 16	120	58	0	1500	1.000	1.00	1.000
3	CH	19 to 26	125	63	0	2500	1.000	1.00	1.000
3	CH	>30	125	63	0	3750	1.000	1.00	1.000
4	Limestone	35	135	73	0	8000	1.000	1.00	1.000
4	Limestone	>50	135	73	0	15000	1.000	1.00	1.000

Estimated shear modulus values based on depth are also provided in the table below.

Boring No.	Depth (feet)	U.S.C.S.	Relative Density	Average Shear Modulus, G (psf)		
				Range		Average
B-1 and B-2	0-4	SP-SM	Loose	100,000	100,000	100,000
	4-6	SP-SM	Medium Dense	222,000	222,000	222,000
	6-10	SP-SM	Loose	89,000	212,000	119,750
	10-14	SP-SM	Medium Dense	162,000	312,000	242,000
	14-18	SP-SM	Very Loose to Loose	67,000	100,000	80,750
	18-27	CH	Soft to very stiff	29,000	81,000	57,000
	27-33	LS	Very Hard	417,000	417,000	417,000
	33-38	CH	Very stiff to hard	93,000	185,000	138,600
	38-40	LS	Very Hard	417,000	417,000	417,000
B-3 and B-4	0-4	SP-SM	Loose	100,000	100,000	100,000
	4-10	SP-SM	Loose to dense	133,000	546,000	282,167
	10-18	SP-SM	Loose to medium dense	100,000	282,000	155,625
	18-30	CH	Soft to very stiff	33,000	93,000	59,909
	30-35	LS	Very Hard	417,000	417,000	417,000
	35-40	CH	Very stiff to hard	65,000	249,000	149,000
B-5 and B-6	0-4	SP-SM	Loose	100,000	100,000	100,000
	4-8	SP-SM	Medium dense to dense	272,000	371,000	324,250
	8-16	LS	Very Hard	417,000	417,000	417,000
	16-30	CH	Very stiff to hard	73,000	177,000	108,077
	30-40	LS	Very hard	417,000	417,000	417,000

In estimating the shear modulus values, an empirical formula (Coduto, 2001) was used to relate the elastic modulus to both N-value and soil type. For the granular soils, we assumed drained conditions and assigned Poisson's ratios of 0.1 for loose soils, 0.2 for medium dense soils, and 0.3 for dense soils (Rowe, 2000). For the clay and limestone layers, we assumed undrained conditions and assigned a Poisson's ratio of 0.5 (Rowe, 2000).

Pipe Installation Recommendations

- Any open trench (excavation) areas for placing and backfilling the pipe should be accomplished in the dry (i.e. not in saturated or submerged conditions). Dewatering to a depth of 2 feet below the bottom of all pipes should be performed prior to placement of bedding and backfill materials.

- Muck, or other organics, encountered in excavations should be removed in their entirety from beneath the pipe and for a minimum lateral distance of 5 feet from pipe/structure edges.
- Should the pipe trench bottom become unstable due to persistent moisture, hydrostatic pressure, or if organics are encountered, the bottom should be over-excavated a minimum of 12 inches (deep) and replaced with clean gravel (FDOT No. 57 Stone).
- Pipe backfill below the existing water level at the time of construction should consist of relatively clean sands or gravels, with a maximum of 15% passing the U.S. No. 200 sieve and no particle size larger than 1 inch in any dimension. Pipe backfill above the existing water level at the time of construction should consist of sands or gravels with particle sizes of less than 1 inch in any dimension, no more than 35 percent fines, and non-plastic (i.e. liquid limit less than 40 and plasticity index less than 10). The fill should be placed in the dry in lifts that do not exceed 12 inches in vertical measure. Each lift should be compacted to at least 95% of the Modified Proctor maximum dry density (ASTM D-1557). Backfill in pavement areas should be compacted to at least 98% density (ASTM D-1557).
- The Stratum 1 soils should generally meet the backfill gradation requirement of a maximum of 15% passing the U.S. No. 200 sieve. The Stratum 2 soils should generally meet the backfill gradation requirement of a maximum of 35% passing the U.S. No.200 sieve. It should be noted that the Stratum 2 soils will be difficult to handle, place, and compact at moisture contents greater than +/- 2% of the optimum moisture content as determined from a Modified Proctor test.
- If pipe is to be installed beneath pavements, the pipe manufacturer's specifications for minimum depth of cover for the pipe should be consulted as applicable for pipe installed in SP, SP-SM, or SM (USCS soil classification) or A-3 and A-2-4 (AASHTO classification) soils compacted to 98% maximum dry density as determined by a Modified Proctor test.
- As a minimum, all temporary excavations should be sloped or braced as required by Occupational Health and Safety Administration (OSHA) regulations to provide stability and safe working conditions. Temporary excavations will probably be required during pipe installation operations. The utility contractor, by contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations including the current OSHA Excavation and Trench safety Standards.

Temporary Dewatering

Dewatering will be needed to facilitate earthwork and underground construction operations for this project. The necessity for dewatering will be dependent on the depth of excavation below existing grade and the groundwater levels at the time of construction. Actual dewatering means and methods should be left up to a contractor experienced in installation and operation of

dewatering systems. The contractor should provide a dewatering plan for review and approval by the engineer prior to the installation of the dewatering systems.

Also, the dewatering plan should consider the potential impact of lowered groundwater (i.e. increased vertical stress on subsoils) on nearby, existing construction.

GENERAL COMMENTS

Our work is conducted with the understanding of the project as described in the proposal, and will incorporate collaboration with the design team prior to completing our services. Terracon has requested verification of all stated assumptions. Revision of our understanding to reflect actual conditions important to our work will be based on these verifications and will be reflected in the final report. The design team should collaborate with Terracon to confirm these assumptions. The design team should also collaborate with Terracon to prepare the final design plans and specifications. This facilitates the incorporation of our opinions related to implementation of our geotechnical recommendations.

Our analysis and opinions are based upon our understanding of the geotechnical conditions in the area, the data obtained from the site exploration performed and from our understanding of the project. Variations will occur between exploration point locations, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. So, Terracon should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

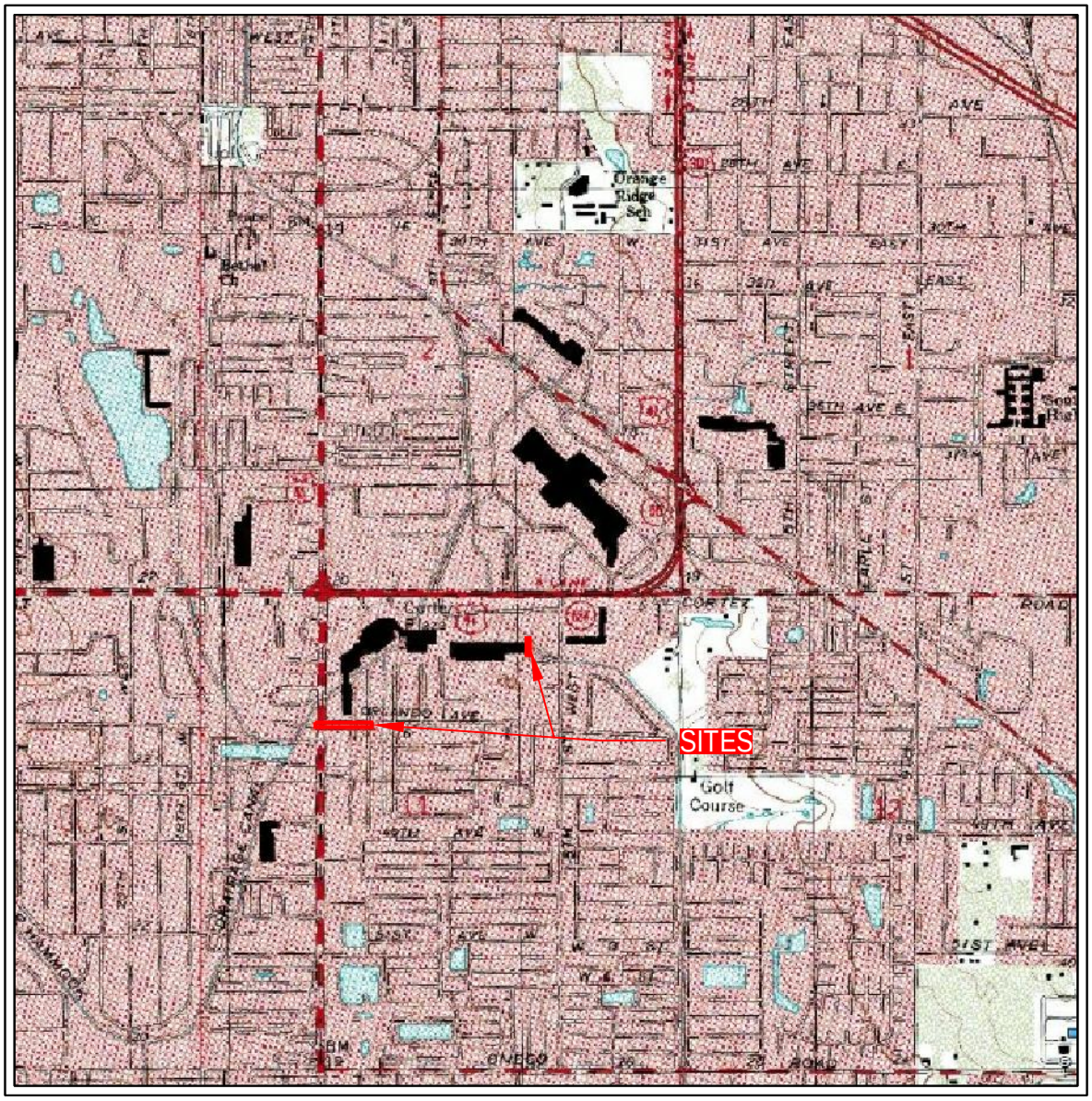
Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, and bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for that specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. In the event that changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be

considered valid unless we review the changes and either verify or modify our conclusions in writing.

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24 000

1 .5 0 KILOMETERS 1 2

1000 0 METERS 1000 2000

1 .5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL: 5 FEET

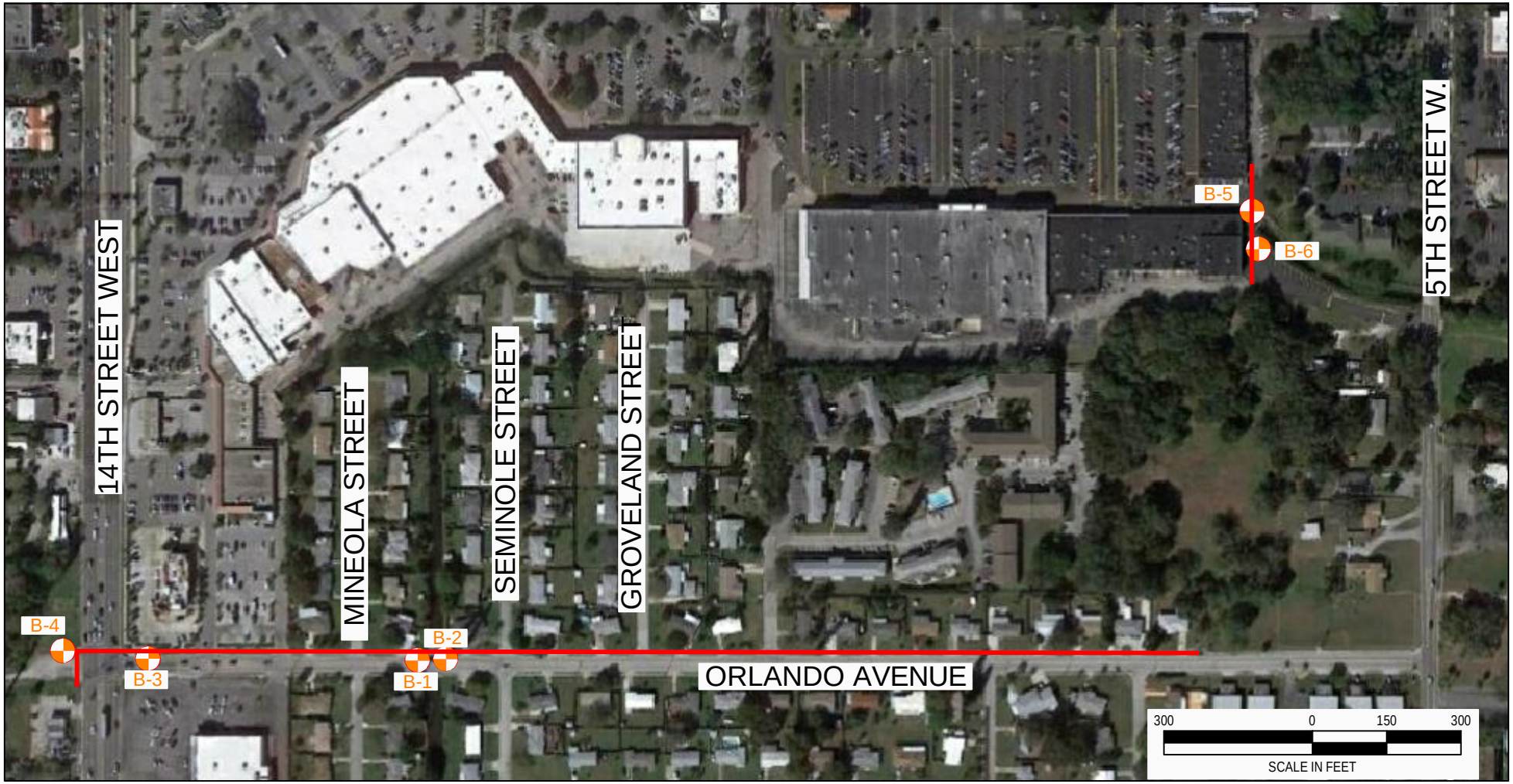
NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

BRADENTON, FL
1994
7.5 MINUTE SERIES (TOPOGRAPHIC)

Project Mngr: JJ	Project No. HC165070	Terracon Consulting Engineers and Scientists	SITE LOCATION
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT
Checked By: JJ	File No. HC165070-1	PH. (941) 379-0621 FAX. (941) 379-5061	ORLANDO AVENUE FORCE MAIN REPLACEMENT
Approved By: DD	Date: 2-9-17		ORLANDO AVENUE MANATEE COUNTY, FLORIDA

EXHIBIT 1



SOURCE: GOOGLE EARTH PRO

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LEGEND

B-1 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

APPROXIMATE ALIGNMENT OF FORCE MAIN REPLACEMENT

Project Mngr:	JJ
Drawn By:	DV
Checked By:	JJ
Approved By:	DD

Project No.	HC165070
Scale:	AS-SHOWN
File No.	HC165070-2
Date:	2-9-17

Terracon
Consulting Engineers and Scientists
8260 VICO COURT, UNIT B SARASOTA, FL 34240
PH. (941) 379-0621 FAX. (941) 379-5061

EXPLORATION PLAN

GEOTECHNICAL ENGINEERING REPORT

ORLANDO AVENUE FORCE MAIN REPLACEMENT

ORLANDO AVENUE

MANATEE COUNTY, FLORIDA

EXHIBIT

2

BORING LOG NO. B-1

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exploration Plan

Latitude: 27.45841° Longitude: -82.5734°

DEPTH	GRAPHIC LOG	DESCRIPTION	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8		**PAVEMENT**, 2" Asphalt, 8" Shell Base						
		POORLY GRADED SAND WITH SILT (SP-SM), brown and gray, loose to medium dense	▽					
					7-9-9-11 N=18	22		9
					7-3-1-1 N=4			
					2-2-2-4 N=4			
					6-10-13-16 N=23			
					4-7-11-8 N=18	23		8
					3-3-2-1 N=5			
					WH-1-1-2 N=2			
18.0					1-2-1-2 N=3			
		CLAY (CH), gray, soft to stiff			4-5-7-8 N=12			
					3-5-7-8 N=12			
					3-5-7-10 N=12			
27.0					8-22-50/3"			
		LIMESTONE, gray, very hard			50/0"			
32.0					50/1"			
		CLAY (CH), gray, very stiff to hard			14-17-20-30 N=37			
					8-10-13-22 N=23			
38.0					10-11-20-18 N=31			
		LIMESTONE, gray, very hard			50/0"			
40.0		***Boring Terminated at 40 Feet***						

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand Auger till 4', Mud Rotary Drilling - Below 4'

Abandonment Method:
Boring backfilled with cement grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WH indicates sampler advanced due to the weight of the hammer

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 3.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/10/2017 Boring Completed: 2/10/2017

Drill Rig: BR-2500 Driller: SK

Project No.: HC165070

BORING LOG NO. B-2

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exploration Plan

Latitude: 27.4584° Longitude: -82.57323°

DEPTH	GRAPHIC LOG		WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8		**PAVEMENT**, 3" Asphalt, 6" Shell Base						
		POORLY GRADED SAND WITH SILT (SP-SM), brown and gray, loose to medium dense	▽					
5					6-8-10-12 N=18			
					9-9-8-5 N=17	20		10
					2-2-2-2 N=4			
10					3-5-7-10 N=12			
					11-13-14-8 N=27			
15					3-2-2-2 N=4			
18.0					1-1-1-1 N=2			
		CLAY (CH), gray, soft to very stiff			2-1-3-4 N=4			
20					4-6-8-9 N=14			
					6-7-9-11 N=16			
25					1-2-5-5 N=7			
27.0					4-8-50/5"			
		LIMESTONE, gray, very hard			50/0"			
30					22-50/1"			
					50/1"			
34.0								
		CLAY (CH), gray, very stiff to hard			6-8-11-15 N=19			
35					11-17-25-43 N=42			
38.0								
		LIMESTONE, gray, very hard			50/0"			
40.0								
40		***Boring Terminated at 40 Feet***						

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand Auger till 4', Mud Rotary Drilling - Below 4'

Abandonment Method:
Boring backfilled with cement grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 3.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/10/2017 Boring Completed: 2/10/2017

Drill Rig: BR-2500 Driller: SK

Project No.: HC165070

BORING LOG NO. B-3

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exploration Plan

Latitude: 27.45842° Longitude: -82.57506°

DEPTH	GRAPHIC LOG	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8		**PAVEMENT**, 3" Asphalt, 6" Shell Base							
2.0		**POORLY GRADED SAND (SP)**, trace shell, brown							
4.0		**SILTY SAND (SM)**, brown and gray					14		37
		POORLY GRADAED SAND WITH SILT (SP-SM), brown and gray, medium dense	5			4-7-8-13 N=15			
				▽		8-9-12-15 N=21			
						20-17-22-15 N=39			
			10			2-3-5-6 N=8			
						8-11-13-19 N=24			
			15			3-7-9-10 N=16			
18.0						6-4-6-5 N=10			
		CLAY (CH), gray, soft to hard				3-2-2-4 N=4			
			20			4-4-5-7 N=9			
						5-6-7-9 N=13			
			25			3-3-5-7 N=8			
						8-8-11-14 N=19			
29.0						50/5"	30	95-61-34	79
		LIMESTONE, gray, very hard	30			50/0"			
32.0									
		CLAY (CH), gray, very stiff to hard				9-16-15-15 N=31			
			35			3-4-8-14 N=12			
						13-15-15-22 N=30			
39.5						28-32-26-50/3" N=58			
40.0		**LIMESTONE**, gray, very hard	40						
		Boring Terminated at 40 Feet							

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand Auger till 4', Mud Rotary Drilling - Below 4'

Abandonment Method:
Boring backfilled with cement grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 7' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/10/2017 Boring Completed: 2/10/2017

Drill Rig: BR-2500 Driller: SK

Project No.: HC165070

BORING LOG NO. B-4

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exploration Plan

Latitude: 27.45846° Longitude: -82.5756°

DEPTH	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	POORLY GRADED SAND (SP), trace shell, brown and gray, loose to very dense		▽					
		5			3-5-8-12 N=13			
					14-25-30-28 N=55			
		10			6-4-4-5 N=8	22		4
					5-4-4-3 N=8			
					5-6-4-3 N=10			
		15			2-2-3-2 N=5			
18.0					4-3-3-3 N=6			
	CLAY (CH), gray, medium stiff to stiff				2-3-2-4 N=5			
		20			4-5-7-8 N=12			
					3-4-4-5 N=8			
		25			3-3-3-6 N=6			
					7-9-10-10 N=19			
30.0					4-6-9-10 N=15			
	LIMESTONE, gray, very hard	30			50/4"			
					10-50/1"			
36.0		35			50/0"			
	CLAY (CH), gray, hard				8-16-16-20 N=32			
40.0					6-11-24-19 N=35			
	Boring Terminated at 40 Feet	40						

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand Auger till 4', Mud Rotary Drilling - Below 4'

Abandonment Method:
Boring backfilled with cement grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 4' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/10/2017 Boring Completed: 2/10/2017

Drill Rig: BR-2500 Driller: SK

Project No.: HC165070

BORING LOG NO. B-5

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exploration Plan

Latitude: 27.46087° Longitude: -82.5682°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8		**PAVEMENT**, 3" Asphalt, 6" Shell Base							
		POORLY GRADED SAND (SP), trace shell and limestone, brown and gray, dense							
						2-20-15-16 N=35			
			5			14-12-11-7 N=23			
						9-13-23-18 N=36			
10.0			10			8-50/4"			
		LIMESTONE, gray, very hard							
12.0						16-10-16-50/1" N=26			
13.5		**CLAY (CH)**, gray, stiff				50/1"			
		LIMESTONE, gray, very hard	15						
16.0						6-6-8-21 N=14	33	111-31-80	90
		CLAY (CH), dark gray to gray, very stiff to hard				8-10-11-13 N=21			
			20			4-6-8-12 N=14			
						10-11-12-11 N=23			
			25			3-6-10-14 N=16			
						12-12-14-13 N=26			
28.0						50/1"			
		LIMESTONE, gray, very hard	30			4-5-30-50/4" N=35			
						50/4"			
						50/0"			
			35			50/0"			
						50/0"			
40.0			40						
		Boring Terminated at 40 Feet							

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand Auger till 4', Mud Rotary Drilling - Below 4'

Abandonment Method:
Boring backfilled with cement grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater was not encountered

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/10/2017 Boring Completed: 2/10/2017

Drill Rig: BR-2500 Driller: SK

Project No.: HC165070

BORING LOG NO. B-6

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exploration Plan

Latitude: 27.46067° Longitude: -82.56817°

DEPTH		FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	**PAVEMENT**, 3" Asphalt, 7" Shell Base				
	POORLY GRADED SAND (SP), trace shell and limestone, brown and gray, medium dense to very dense	8-11-14-28 N=25			
6.0		50/3"			
	LIMESTONE, gray, very hard	50/2"			
10.0					
	SILTY SAND (SM), gray, medium dense to very dense	5-5-23-12 N=28	17		20
14.0		6-7-50/4"			
15.5	**CLAY (CH)**, dark gray to gray, very stiff to hard	6-8-13-50/3" N=21			
	LIMESTONE, gray, very hard	50/0"			
18.0					
	CLAY (CH), dark gray, very stiff to hard	17-40-50/3"			
		8-9-11-13 N=20			
		8-9-11-15 N=20			
		7-11-15-18 N=26			
		9-11-14-16 N=25			
		7-9-21-38 N=30			
30.0	**LIMESTONE**, gray, very hard	50/5"			
		50/1"			
		50/5"			
38.0		50/2"			
	CLAY (CH), dark gray, very stiff to hard	3-25-23-25 N=48			
40.0	***Boring Terminated at 40 Feet***				

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

Hammer Type: Rope and Cathead

Advancement Method:
Hand Auger till 4', Mud Rotary Drilling - Below 4'

Abandonment Method:
Boring backfilled with cement grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Grounwater was not encountered

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 2/10/2017 Boring Completed: 2/10/2017

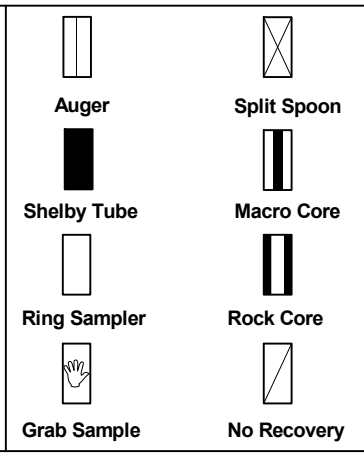
Drill Rig: BR-2500 Driller: SK

Project No.: HC165070

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, psf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42
			Hard	> 8,000	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

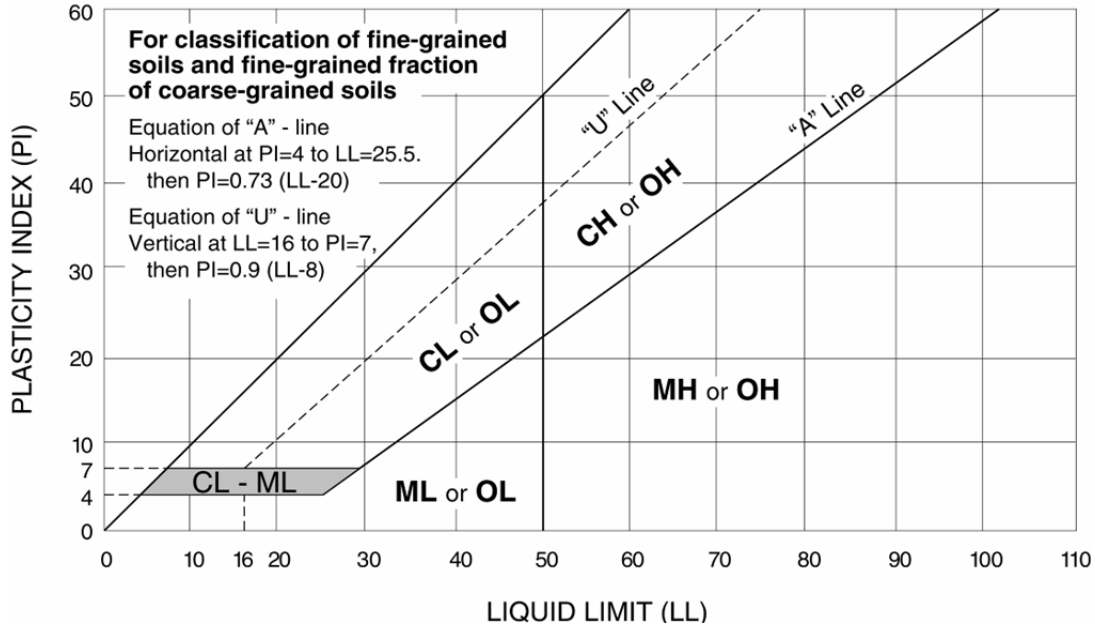
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



DESCRIPTION OF ROCK PROPERTIES

WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, PSI (MPa)**
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft (50 – 300 mm)
Moderate	8 in – 2 ft (200 – 600 mm)	**Medium**	1 ft – 3 ft (300 – 900 mm)
Wide	2 ft – 6 ft (600 mm – 2.0 m)	**Thick**	3 ft – 10 ft (900 mm – 3 m)
Very Wide	6 ft – 20 ft (2.0 – 6 m)	**Massive**	> 10 ft (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0 degree angle.

ROCK QUALITY DESIGNATION (RQD*)	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

*The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements

June 8, 2017

Kimley-Horn and Associates, Inc.
655 North Franklin Street, Suite 150
Tampa, Florida 33602

Attn: Mr. Wade Wood III, P.E.
E: Wade.Wood@kimley-horn.com

Re: Supplemental Geotechnical Engineering Services
Orlando Avenue Force Main Replacement
Manatee County, Florida
Terracon Project Number: HC165070, Addendum No. 1

Dear Mr. Wood:

Terracon Consultants, Inc. (Terracon) is pleased to provide Addendum No. 1 to our report dated March 6, 2017. This addendum provides the results of the supplemental laboratory corrosion series testing results from five (5) hand auger borings at your requested locations. The locations of the borings are indicated on the *Boring Location Plan* as Exhibit A-1.

Field Exploration

The subsurface conditions were explored in May 2017 with five (5) hand auger borings to a maximum depth of about 6 feet bgs.

Subsurface Conditions

Based on the results of the borings, subsurface conditions can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description
1	5 to 6 feet	Fine SAND with trace to slight amounts of silt and shell fragments (SP)

Corrosion Series Testing Results

Five (5) soil samples from varying depths of the five (5) borings were transported to Palm Beach Laboratories, Inc. for Florida Department of Transportation (FDOT) corrosion series testing (pH, resistivity, sulfate content, and chloride content). The results of the corrosion series tests, along with their environmental classification based on Table 1.3.2-1 of the FDOT Structures Design Guidelines (January 2017), are summarized below.

The corrosion series test results can be seen in their entirety in Appendix B.

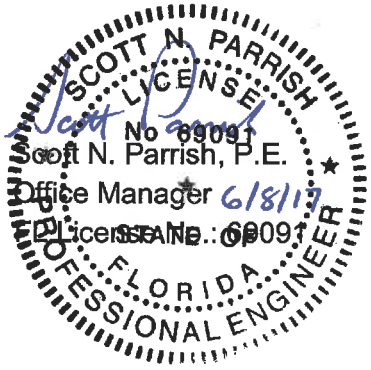
Boring	Depth (ft.)	pH	Resistivity (ohms-cm)	Chloride Content (mg/kg)	Sulfate Content (mg/kg)	Environmental Classification	
						Steel	Concrete
AB-1	4.2 to 5.0	8.0	5,810	4.9	8.7	Slightly aggressive	Slightly aggressive
AB-2	4.0 to 6.0	8.2	7,120	5.3	8.0	Slightly aggressive	Slightly aggressive
AB-3	4.0 to 6.0	8.4	7,050	2.8	8.2	Slightly aggressive	Slightly aggressive
AB-4	0.0 to 1.5	7.5	9,330	4.3	10.8	Slightly aggressive	Slightly aggressive
AB-5	2.0 to 4.0	8.0	7,910	137.0	4.5	Slightly aggressive	Slightly aggressive

Our original report should be consulted for all other geotechnical recommendations and limitations associated with this project. We appreciate the opportunity to continue to be of service during this phase of the project. If you have any questions, please contact the undersigned at 941-379-0621.

Sincerely,
Terracon Consultants, Inc.

Sruthi M

Sruthi Mantri, E.I.
Staff Engineer

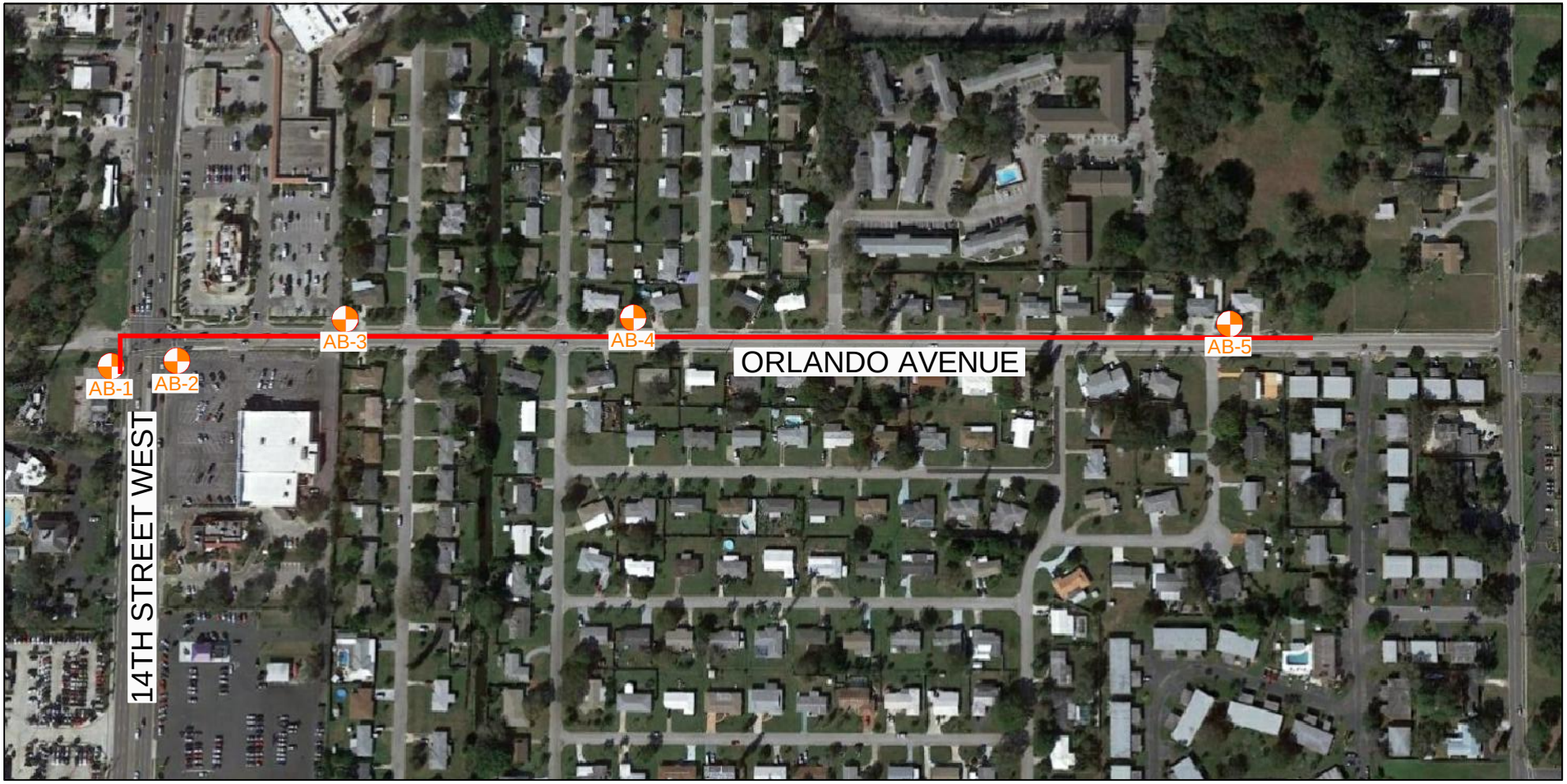


Scott N. Parrish, P.E.
Office Manager 6/8/17
License No.: 69091

Attachments: Appendix A – Field Exploration
Exhibit A-1 – Boring Location Plan
Exhibits A-2 & A-6 – Boring Logs

Appendix B – Corrosion Series Test Results

APPENDIX A
FIELD EXPLORATION



SOURCE: GOOGLE EARTH PRO

300 0 150 300

SCALE IN FEET

LEGEND

AB-1 APPROXIMATE LOCATION OF HAND AUGER BORING

APPROXIMATE ALIGNMENT OF FORCE MAIN REPLACEMENT

Project Mngr:	JJ
Drawn By:	SM
Checked By:	JJ
Approved By:	DD

Project No.	HC165070
Scale:	AS-SHOWN
File No.	HC165070-2
Date:	6-6-2017

Terracon
Consulting Engineers and Scientists
8260 VICO COURT, UNIT B SARASOTA, FL 34240
PH. (941) 379-0621 FAX. (941) 379-5061

EXPLORATION PLAN

GEOTECHNICAL ENGINEERING REPORT

ORLANDO AVENUE FORCE MAIN REPLACEMENT- ADDENDUM 1

ORLANDO AVENUE

MANATEE COUNTY, FLORIDA

EXHIBIT

A-1

BORING LOG NO. AB-1

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exhibit A-1

Latitude: 27.458276° Longitude: -82.575583°

GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
		POORLY GRADED SAND (SP), trace silt and shell fragments, dark brown			
	3.0	**POORLY GRADED SAND (SP)**, trace silt and shell fragments, light brown			
	4.2	**POORLY GRADED SAND (SP)**, trace silt and shell fragments, dark gray			
	5.0	***Boring Terminated at 5 Feet***	5		

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

Advancement Method:
Hand Auger

Abandonment Method:
Boring backfilled with cement grout upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 5/16/2017 | Boring Completed: 5/16/2017

Drill Rig: | Driller: SK

Project No.: HC165070 | Exhibit: A-2

BORING LOG NO. AB-2

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exhibit A-1

Latitude: 27.458267° Longitude: -82.575162°

GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
		POORLY GRADED SAND (SP), trace gravel and shell fragments, dark brown			
	4.0				
		POORLY GRADED SAND (SP), trace gravel and shell fragments, gray	5		
	6.0				
		Boring Terminated at 6 Feet			

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

Advancement Method:
Hand Auger

Abandonment Method:
Boring backfilled with cement grout upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 5/16/2017	Boring Completed: 5/16/2017
Drill Rig:	Driller: SK
Project No.: HC165070	Exhibit: A-3

BORING LOG NO. AB-3

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exhibit A-1

Latitude: 27.458434° Longitude: -82.574159°

GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
		POORLY GRADED SAND (SP), dark brown			
	4.0				
		POORLY GRADED SAND (SP), trace silt, gray	5		
	6.0				
		Boring Terminated at 6 Feet			

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

Advancement Method:
Hand Auger

Abandonment Method:
Boring backfilled with cement grout upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 5/16/2017	Boring Completed: 5/16/2017
Drill Rig:	Driller: SK
Project No.: HC165070	Exhibit: A-4

BORING LOG NO. AB-4

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exhibit A-1

Latitude: 27.45844° Longitude: -82.572402°

GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
		POORLY GRADED SAND (SP), trace shell gragments, drak gray			
	1.5	**POORLY GRADED SAND (SP)**, trace shell gragments, light brown			
	3.3	**POORLY GRADED SAND (SP)**, trace shell gragments, dark brown			
	5.0	***Boring Terminated at 5 Feet***	5		

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

Advancement Method:
Hand Auger

Abandonment Method:
Boring backfilled with cement grout upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 5/16/2017 | Boring Completed: 5/16/2017

Drill Rig: | Driller: SK

Project No.: HC165070 | Exhibit: A-5

BORING LOG NO. AB-5

PROJECT: Orlando Avenue Force Main

CLIENT: Kimley-Horn and Associates, Inc.
Tampa, Florida

SITE: Orlando Avenue
Manatee County, Florida

LOCATION See Exhibit A-1

Latitude: 27.458444° Longitude: -82.568836°

GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
		POORLY GRADED SAND (SP), trace shell gragments, dark gray			
	2.0	**POORLY GRADED SAND (SP)**, trace shell gragments, brown			
	4.0	**POORLY GRADED SAND (SP)**, trace shell gragments, dark brown	5		
	6.0	***Boring Terminated at 6 Feet***			

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

Advancement Method:
Hand Auger

Abandonment Method:
Boring backfilled with cement grout upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 5/16/2017 | Boring Completed: 5/16/2017

Drill Rig: | Driller: SK

Project No.: HC165070 | Exhibit: A-6

APPENDIX B
CORROSION SERIES TEST RESULTS

Palm Beach Environmental Laboratories Inc.

Sruthi Mantri
Terracon-Sarasota
Sarasota, FL 34240
(702) 499-0021
LOG #: 0015532

May 31, 2017

Enclosed is the laboratory report for your project. All results meet the requirements of the NELAC standards.

Please note the following:

(1) The samples were received as stated on the chain of custody, correctly labeled and at the proper temperature unless otherwise noted. The results contained in this report relate only to the items tested or to the samples as received by the laboratory.

(2) This report may not be reproduced except in full, without the written approval of the laboratory. Any anomalies are noted in the case narrative.

(3) Results for all solid matrices are reported in dry weight unless otherwise noted.

(4) Results for all liquid matrices are analyzed as received in the laboratory unless otherwise noted.

(5) Samples are disposed of within 30 days of their receipt by the laboratory.

(6) A statement of Qualifiers is available upon request.

(7) Certain analyses are subcontracted to outside NELAC certified laboratories and are designated on your report.

(8) Precision & Accuracy will be provided when clients require a measure of estimated uncertainty.

(9) The issuance of the final Certificate of Analysis takes precedence over any previous Preliminary Report Preliminary Data should not be used for regular purposes. Authorized signature(s) is provided on final report only

Please contact me if you have any questions or concerns regarding this report.

Sincerely,

Pamela Shore
QA Officer

Palm Beach Environmental Laboratories Inc.

CERTIFICATE OF ANALYSIS

Terracon-Sarasota
8620 Vico Court, Unit B
Sarasota, FL 34240

ATTN: Sruthi Mantri
PHONE: (702) 499-0021 **FAX:** .

LOG #: 0015532
COC#: 1286
REPORTED: 5/31/2017 5:30:08PM
PROJECT #: HC165070
PROJECT: Orlando Avenue

Description: AB-1 (50"-60")
Matrix: Soil
Lab ID: 0015532-01
Sampled By: Client
Sampled: 05/16/17 00:00
Received: 05/19/17 10:15

pH

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	pH	8.0	JEE	S.U.	EPA 9045C	1	0.10	0.30	05/25/17	05/25/17	SL

Resistivity

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	Resistivity	5810	JEE	ohms*cm	ASTM-D1125	1	1.0	3.0	05/25/17	05/25/17	SL

SM4500CL-B

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
16887-00-6	Chloride	4.9	JEE, I	mg/kg	EPA 300.0	1	2.8	8.4	05/24/17	05/25/17	SL

Sulfate

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
148-08-798	Sulfate as SO4	8.7	JEE	mg/kg	EPA 9056	1	2.8	8.4	05/24/17	05/25/17	SL

Palm Beach Environmental Laboratories Inc.

CERTIFICATE OF ANALYSIS

Terracon-Sarasota
8620 Vico Court, Unit B
Sarasota, FL 34240

ATTN: Sruthi Mantri
PHONE: (702) 499-0021 **FAX:** .

LOG #: 0015532
COC#: 1286
REPORTED: 5/31/2017 5:30:08PM
PROJECT #: HC165070
PROJECT: Orlando Avenue

Description: AB-2 (4-6')
Matrix: Soil
Lab ID: 0015532-02
Sampled By: Client
Sampled: 05/16/17 00:00
Received: 05/19/17 10:15

pH

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	pH	8.2	JEE	S.U.	EPA 9045C	1	0.10	0.30	05/25/17	05/25/17	SL

Resistivity

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	Resistivity	7120	JEE	ohms*cm	ASTM-D1125	1	1.0	3.0	05/25/17	05/25/17	SL

SM4500CL-B

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
16887-00-6	Chloride	5.3	JEE, I	mg/kg	EPA 300.0	1	2.8	8.4	05/24/17	05/25/17	SL

Sulfate

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
148-08-798	Sulfate as SO4	8.0	JEE, I	mg/kg	EPA 9056	1	2.8	8.4	05/24/17	05/25/17	SL

Palm Beach Environmental Laboratories Inc.

CERTIFICATE OF ANALYSIS

Terracon-Sarasota
8620 Vico Court, Unit B
Sarasota, FL 34240
ATTN: Sruthi Mantri
PHONE: (702) 499-0021 **FAX:** .

LOG #: 0015532
COC#: 1286
REPORTED: 5/31/2017 5:30:08PM
PROJECT #: HC165070
PROJECT: Orlando Avenue

Description: AB-3 (4-6')
Matrix: Soil
Lab ID: 0015532-03
Sampled By: Client
Sampled: 05/16/17 00:00
Received: 05/19/17 10:15

pH

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	**pH**	**8.4**	JEE	S.U.	EPA 9045C	1	0.10	0.30	05/25/17	05/25/17	SL

Resistivity

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	**Resistivity**	**7050**	JEE	ohms*cm	ASTM-D1125	1	1.0	3.0	05/25/17	05/25/17	SL

SM4500CL-B

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
16887-00-6	Chloride	2.8	JEE, U	mg/kg	EPA 300.0	1	2.8	8.4	05/24/17	05/25/17	SL

Sulfate

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
148-08-798	**Sulfate as SO4**	**8.2**	JEE, I	mg/kg	EPA 9056	1	2.8	8.4	05/24/17	05/25/17	SL

Palm Beach Environmental Laboratories Inc.

CERTIFICATE OF ANALYSIS

Terracon-Sarasota
8620 Vico Court, Unit B
Sarasota, FL 34240
ATTN: Sruthi Mantri
PHONE: (702) 499-0021 **FAX:** .

LOG #: 0015532
COC#: 1286
REPORTED: 5/31/2017 5:30:08PM
PROJECT #: HC165070
PROJECT: Orlando Avenue

Description: AB-4 (0-18")
Matrix: Soil
Lab ID: 0015532-04
Sampled By: Client
Sampled: 05/16/17 00:00
Received: 05/19/17 10:15

pH

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	pH	7.5	JEE	S.U.	EPA 9045C	1	0.10	0.30	05/25/17	05/25/17	SL

Resistivity

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	Resistivity	9330	JEE	ohms*cm	ASTM-D1125	1	1.0	3.0	05/25/17	05/25/17	SL

SM4500CL-B

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
16887-00-6	Chloride	4.3	JEE, I	mg/kg	EPA 300.0	1	2.8	8.4	05/24/17	05/25/17	SL

Sulfate

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
148-08-798	Sulfate as SO4	10.8	JEE	mg/kg	EPA 9056	1	2.8	8.4	05/24/17	05/25/17	SL

Palm Beach Environmental Laboratories Inc.

CERTIFICATE OF ANALYSIS

Terracon-Sarasota
8620 Vico Court, Unit B
Sarasota, FL 34240
ATTN: Sruthi Mantri
PHONE: (702) 499-0021 **FAX:** .

LOG #: 0015532
COC#: 1286
REPORTED: 5/31/2017 5:30:08PM
PROJECT #: HC165070
PROJECT: Orlando Avenue

Description: AB-5 (2-4''')
Matrix: Soil
Lab ID: 0015532-05
Sampled By: Client
Sampled: 05/16/17 00:00
Received: 05/19/17 10:15

pH

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	pH	8.0	JEE	S.U.	EPA 9045C	1	0.10	0.30	05/25/17	05/25/17	SL

Resistivity

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
NA	Resistivity	7910	JEE	ohms*cm	ASTM-D1125	1	1.0	3.0	05/25/17	05/25/17	SL

SM4500CL-B

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
16887-00-6	Chloride	137.0	JEE	mg/kg	EPA 300.0	1	2.8	8.4	05/24/17	05/25/17	SL

Sulfate

CAS #	Parameter	Results	Q	Units	Method	DF	MDL	PQL	Extraction Date	Analysis Date	Analyst
148-08-798	Sulfate as SO4	4.5	JEE, I	mg/kg	EPA 9056	1	2.8	8.4	05/24/17	05/25/17	SL

Notes and Definitions

U	Analyte included in the analysis, but not detected
I	The reported value is between the laboratory Method Detection Limit & the laboratory Practical Quantitation Limit
JEE	Analysis performed by Florida Environmental Cert#E86006 1460 W McNabb Road Ft. Lauderdale FL 33309

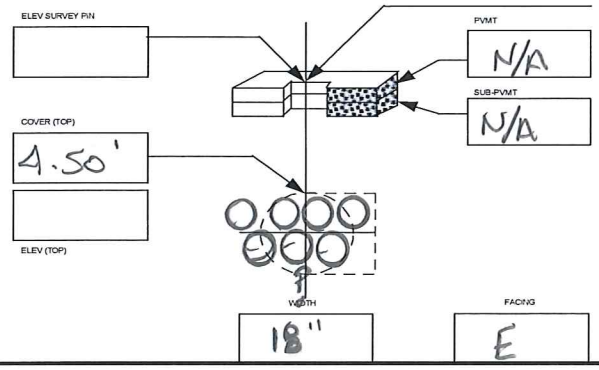
APPENDIX C – SUE REPORTS

Omni Communications
Subsurface Utility Engineering

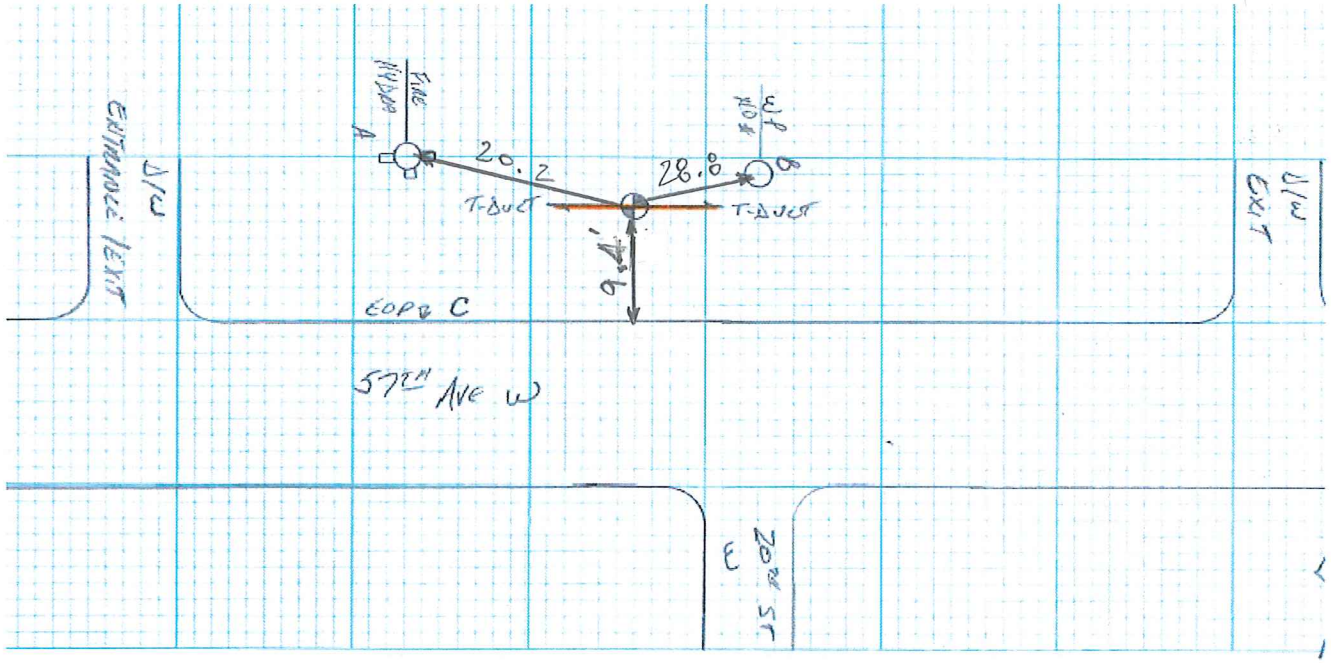
VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-062
Test Hole No.:

PROJECT NAME: Forcemain 28A Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: Locating Designating	**Cover Estab By. :** PD **COVER CHECKED BY:** AC
REQUESTED BY: FDC	**FORM BY:** PD **ASSITED BY:** AC
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**NUMBER OF HOLES DUG:** **TODAY'S DATE:**
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**INSTALLED:** HUB PIN CHISX NAIL **AT:** CROWN or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER	**DIGITAL PHOTO** Y N No.
SIZE AS FOUND: **SIZE EXPECTED:**	**NOTES:** FOUND MULTIPLE 4" BT DUCT @ 4.50'
UTILTIY COLOR:	



VACUUMED: AIR LANCED:	
SURVEY PIN LOCATED BY: FDC	THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.
STATION OFFSET: LT/RT	



Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-027
Test Hole No.: 1

PROJECT NAME: Port of Manatee FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

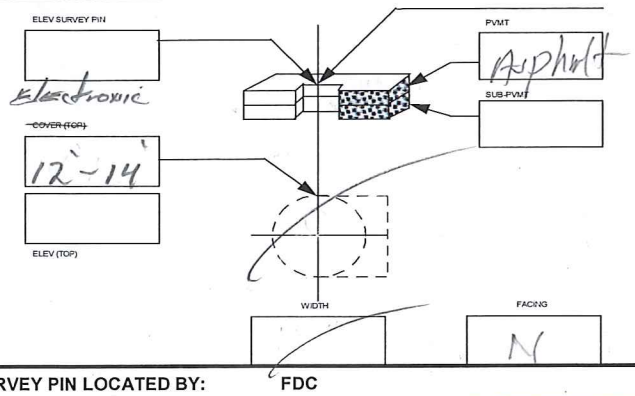
REQUESTED UTILITY: WATER RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: OIL LINE

LOCATED UTILITY: WATER RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION (EXPLORE) UNK N/A OTHER: ~~OIL LINE~~

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP
TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: / **SIZE EXPECTED:** 30"

UTILTIY COLOR:



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By. : JC **COVER CHECKED BY:** ML

FORM BY: MN **ASSITED BY:** ML

NUMBER OF HOLES DUG: 2 **TODAY'S DATE:** 5-24-17

INSTALLED: HUB PIN CHISX (NAIL)

AT: (CROWN) or EDGE side of utility: E W S N

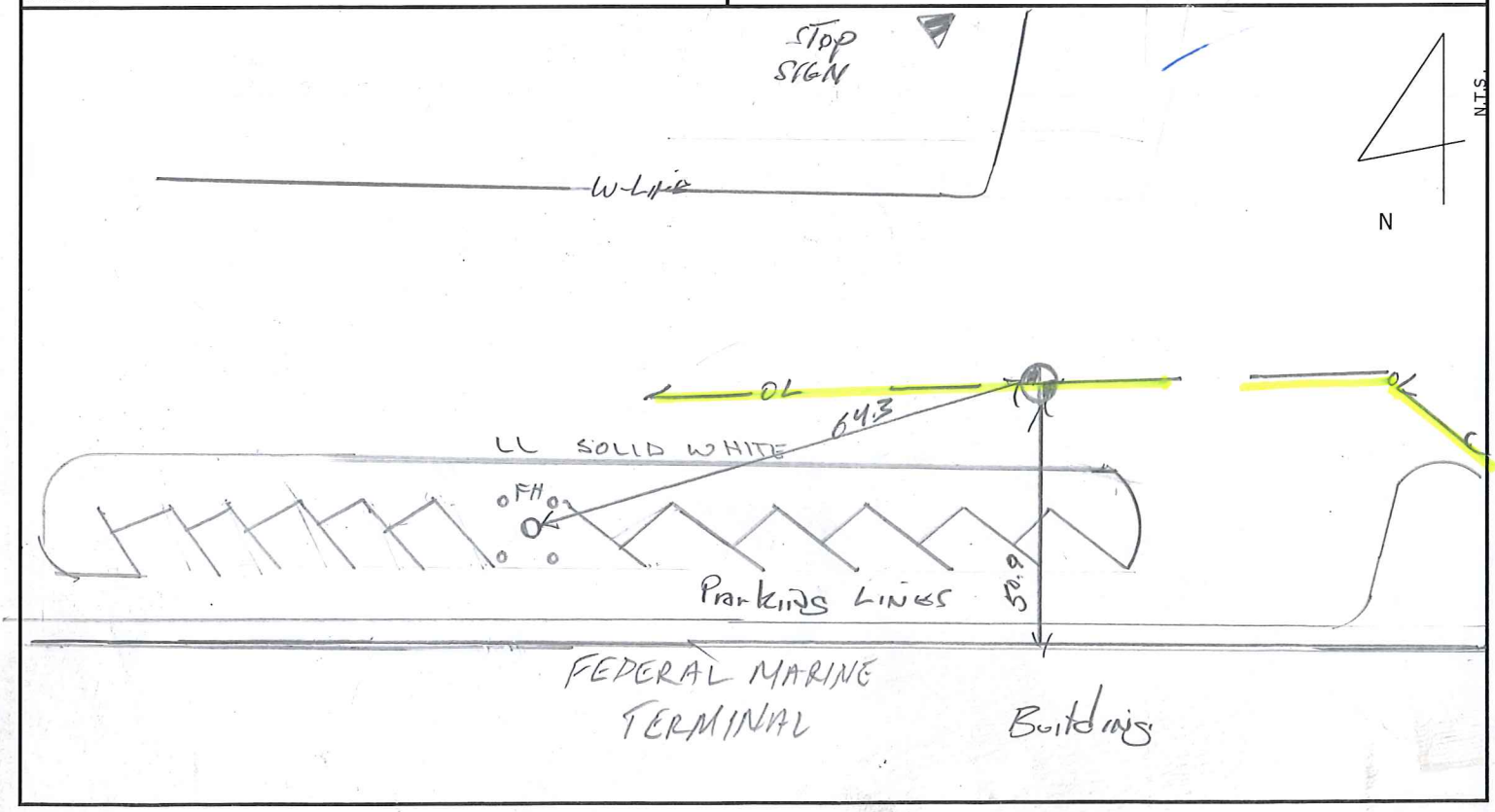
DIGITAL PHOTO (Y) N No. _____

NOTES:
NO UTILITY DETECTED
VAC 8 FT
LANCE 10 FT
FPL
Electronic Depth Readings
12'-14' Deep.

NOTE!
HOLE DUG PER BILL

VACUUMED: 8' AIR LANCED: 10'

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.

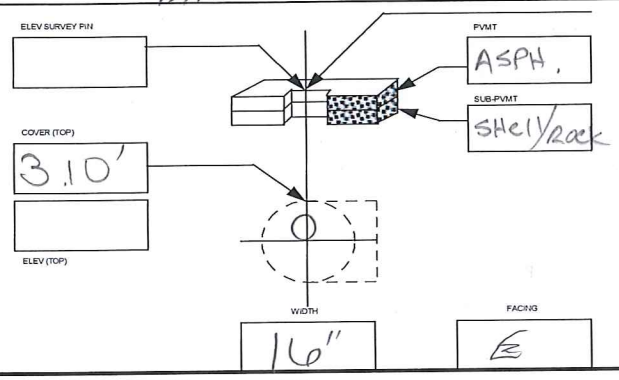


Omni Communications
Subsurface Utility Engineering

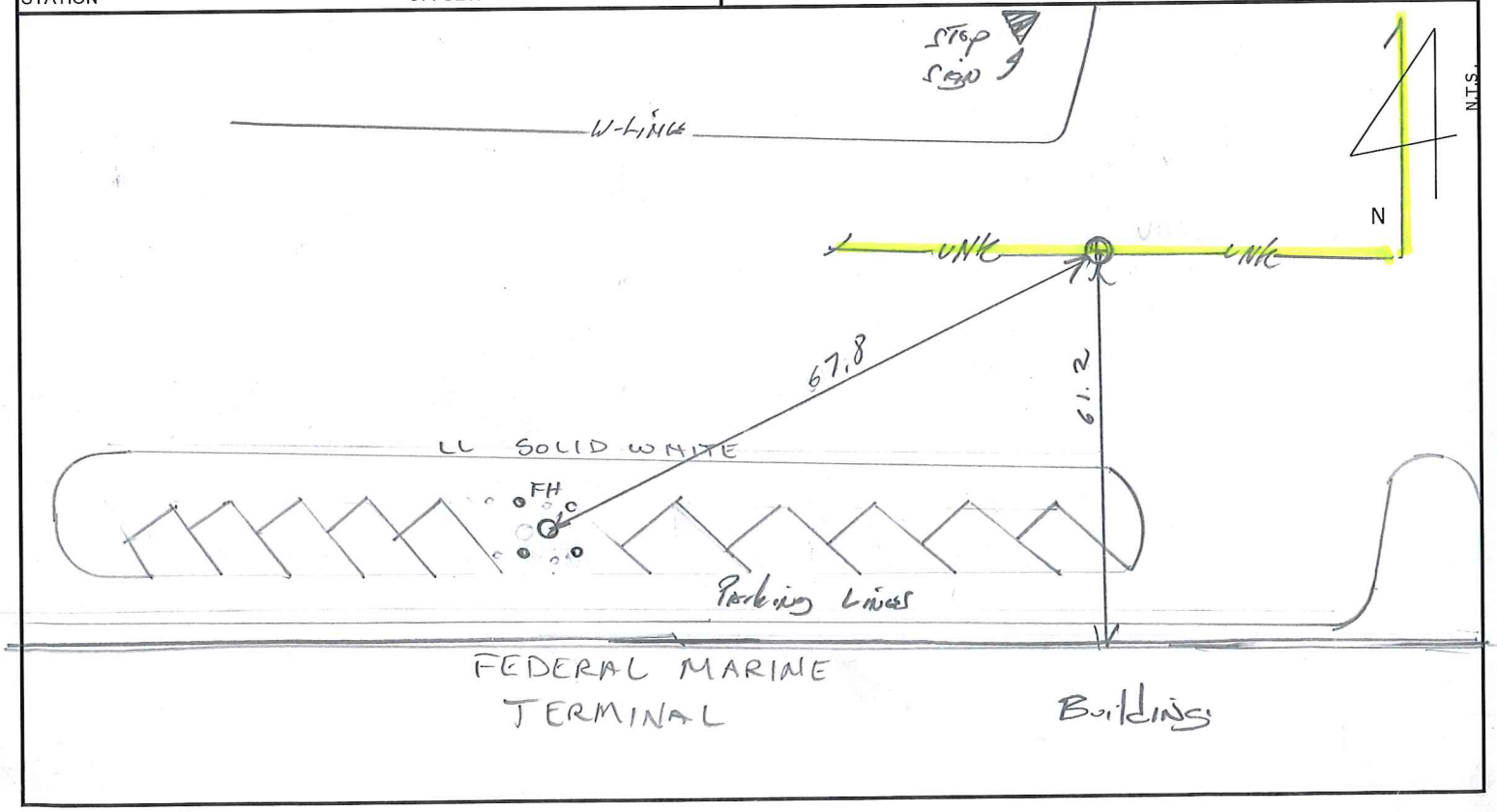
VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-027
Test Hole No.: 2

PROJECT NAME: Port of Manatee FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** JL **COVER CHECKED BY:** ML
REQUESTED BY: FDC	**FORM BY:** MH **ASSITED BY:** ML
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: OIL LINE	**NUMBER OF HOLES DUG:** **TODAY'S DATE:** 5-24-17
	INSTALLED: HUB PIN CHISX (NAIL)
	AT: CROWN or EDGE side of utility: E W S N
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE (UNK) N/A OTHER: _____	**DIGITAL PHOTO** (Y) N No. _____
MATERIAL AS FOUND: DIP CIP (STL) W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**NOTES:** FND 16" STL. PIPE Pass - Oil LINE Not FPL's
SIZE AS FOUND: 16" **SIZE EXPECTED:** UNK	
UTILTIY COLOR: BLK	



	VACUUMED: AIR LANCED:
SURVEY PIN LOCATED BY: FDC	THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.
STATION OFFSET: LT/RT	



5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-027
Test Hole No.: 3

PROJECT NAME: Port of Manatee FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

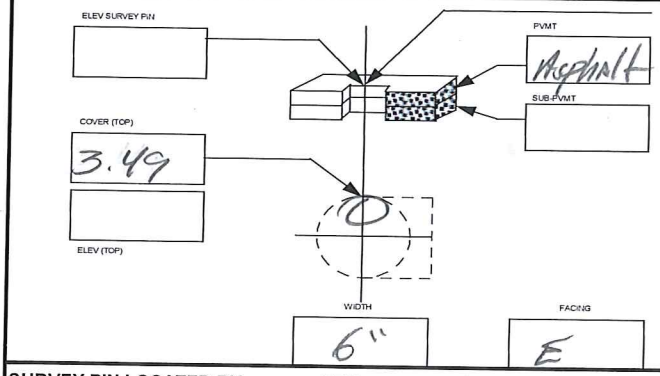
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE (UNK) N/A OTHER: _____

LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE (UNK) N/A OTHER: _____

MATERIAL AS FOUND: DIP CIP (STL) W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: 6" **SIZE EXPECTED:** UNK

UTILTIY COLOR:



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By.: ML **COVER CHECKED BY:** JC

FORM BY: ML **ASSISTED BY:** JC

NUMBER OF HOLES DUG: 1 **TODAY'S DATE:**

INSTALLED: HUB PIN CHISX (NAIL)

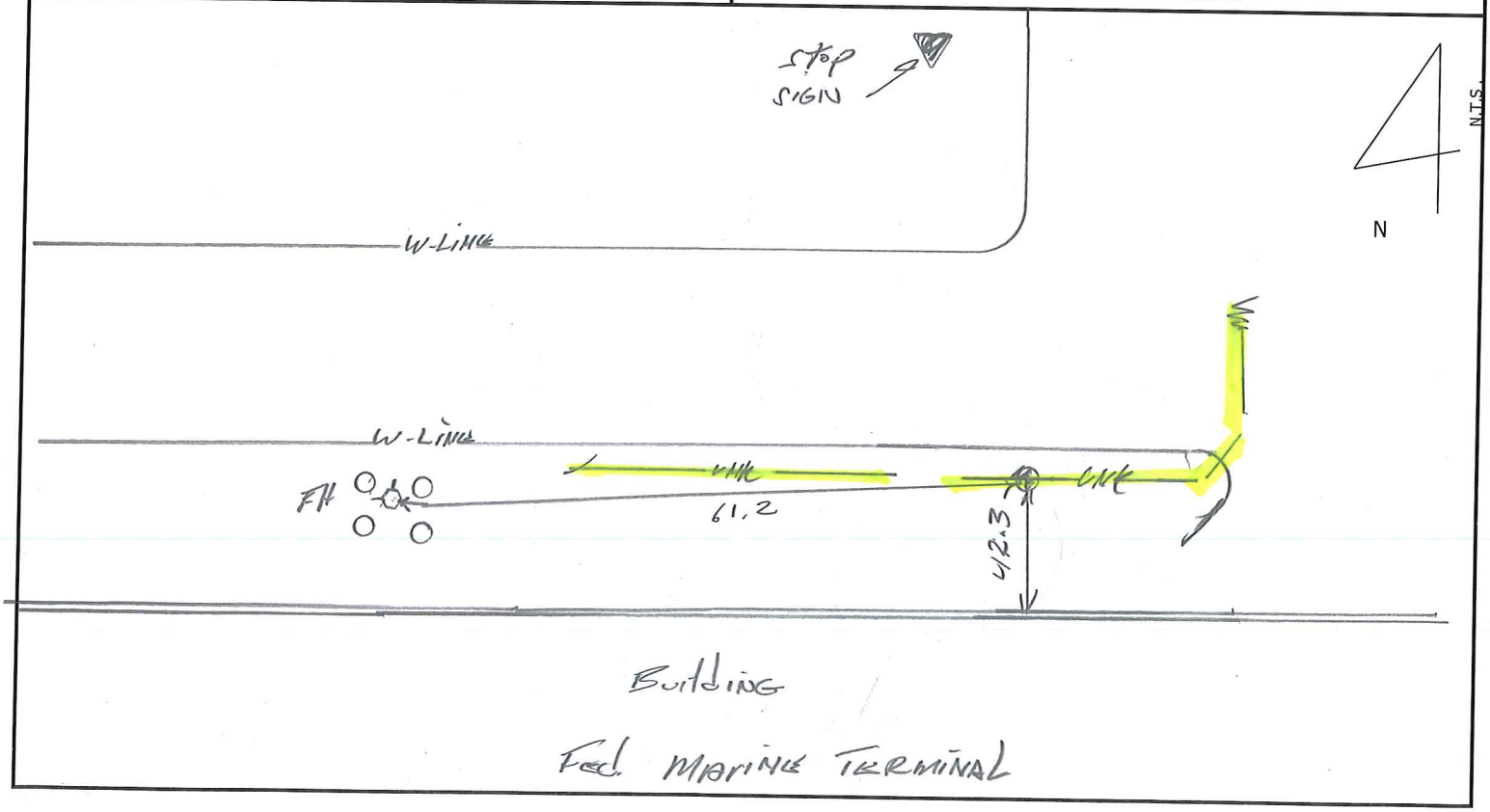
AT: (CROWN) or EDGE side of utility: E W S N

DIGITAL PHOTO (Y) N No. _____

NOTES: Found 6" STL UNK LINE Rusty Poor Condition

VACUUMED: AIR LANCED:

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



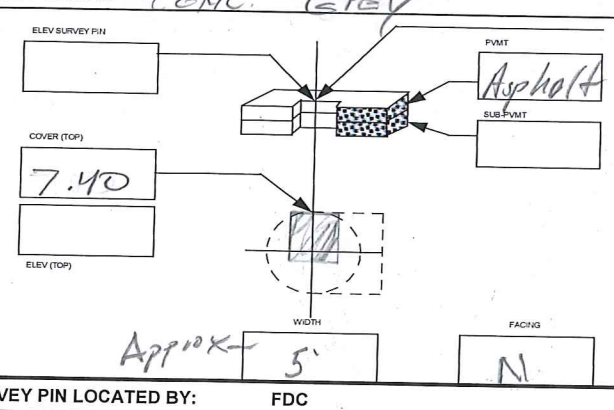
5/23/2017

Omni Communications
Subsurface Utility Engineering

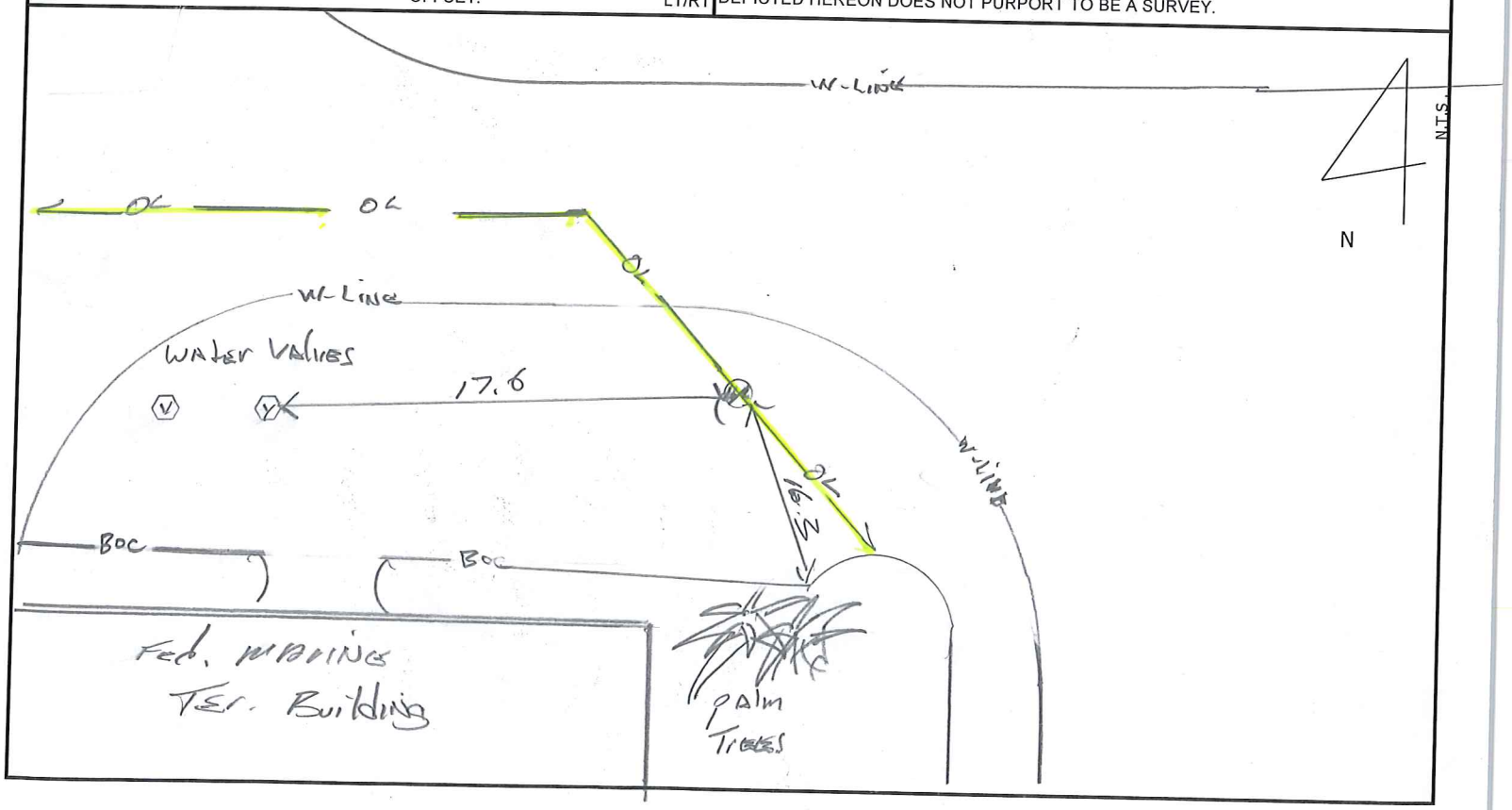
VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-027
Test Hole No.: 4

PROJECT NAME: Port of Manatee FM Replacement	**FPID:** WORK ORDER No
JOB TYPE: (Locating) Designating	**Cover Estab By.:** MC **COVER CHECKED BY:** JC
REQUESTED BY: FDC	**FORM BY:** MC **ASSITED BY:** JC
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: OIL LINE	**NUMBER OF HOLES DUG:** 1 **TODAY'S DATE:**
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: OIL LINE	**INSTALLED:** HUB PIN CHISX (NAIL) **AT:** (CROWN) or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA (CONC) ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**DIGITAL PHOTO** (Y) N No. _____
SIZE AS FOUND: APPROX 5" **SIZE EXPECTED:** 5" CON-CAP	**NOTES:** FOUND TOP CONC. CAP ON OIL LINE
UTILTIY COLOR: CONC. - GREY	



SURVEY PIN LOCATED BY: FDC	VACUUMED: AIR LANCED:
STATION OFFSET: LT/RT	THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-027
Test Hole No.: 5

PROJECT NAME: Port of Manatee FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

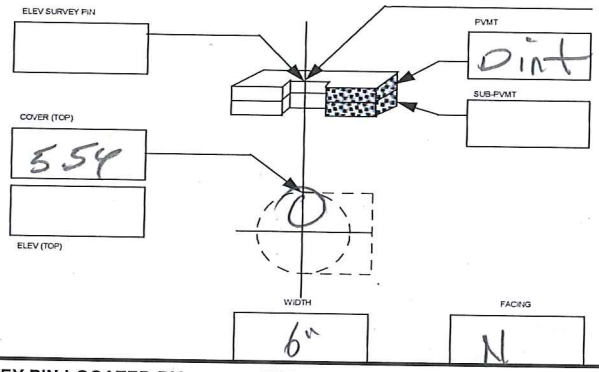
REQUESTED UTILITY: WATER RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: Oil Line

LOCATED UTILITY: WATER RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: Oil Line

MATERIAL AS FOUND: DIP CIP (STL) W/STL EXY/STL CMP VXCP
TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: **SIZE EXPECTED:**

UTILTIY COLOR:



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By.: ML **COVER CHECKED BY:** JC

FORM BY: ML **ASSITED BY:** JC

NUMBER OF HOLES DUG: **TODAY'S DATE:**

INSTALLED: (HUB) PIN CHISX NAIL

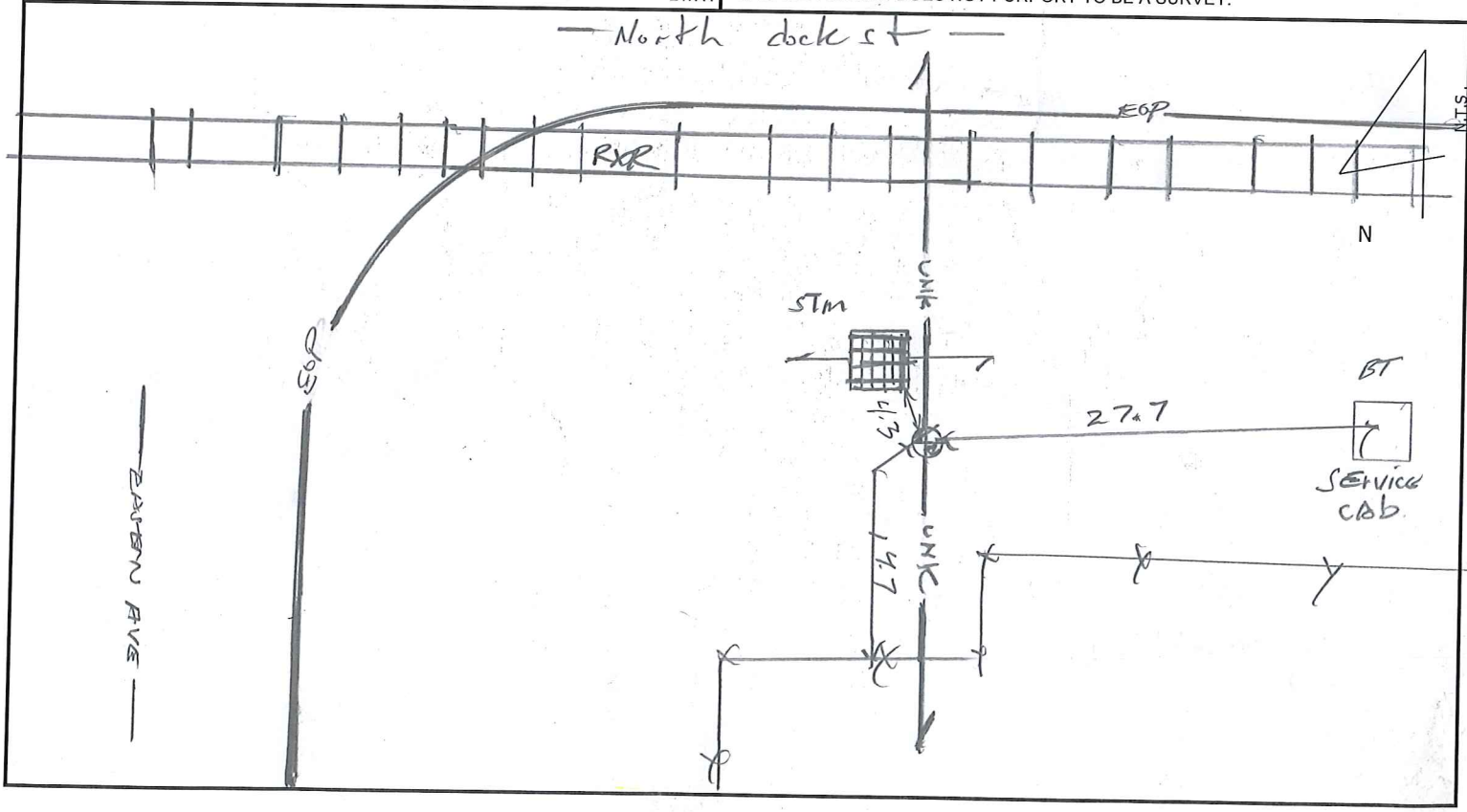
AT: (CROWN) or EDGE side of utility: E W S N

DIGITAL PHOTO (Y) N No. _____

NOTES: Found 14" STL LINE UNK poss. Oil LINE

VACUUMED: AIR LANCED:

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

Omni Communications
Subsurface Utility Engineering

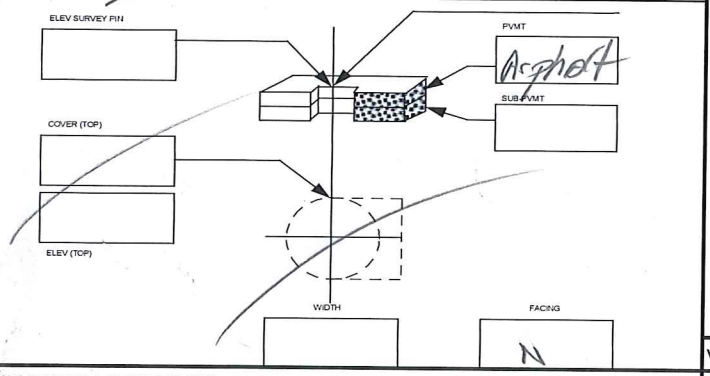
VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-027
Test Hole No.: 6

PROJECT NAME: Port of MANATEE FM
JOB TYPE: (Locating) Designating
REQUESTED BY:
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: OIL, GAS
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK (N/A) OTHER _____
SIZE AS FOUND: SIZE EXPECTED: 12, 10, 10, 6
UTILTIY COLOR: 18

FPID: WORK ORDER No
Cover Estab By.: ML COVER CHECKED BY: PD
FORM BY: ML ASSITED BY: PD
NUMBER OF HOLES DUG: 2 TODAY'S DATE:
INSTALLED: HUB PIN CHISX (NAIL)
AT: CROWN or EDGE side of utility: E W S N
DIGITAL PHOTO (Y) N No. _____

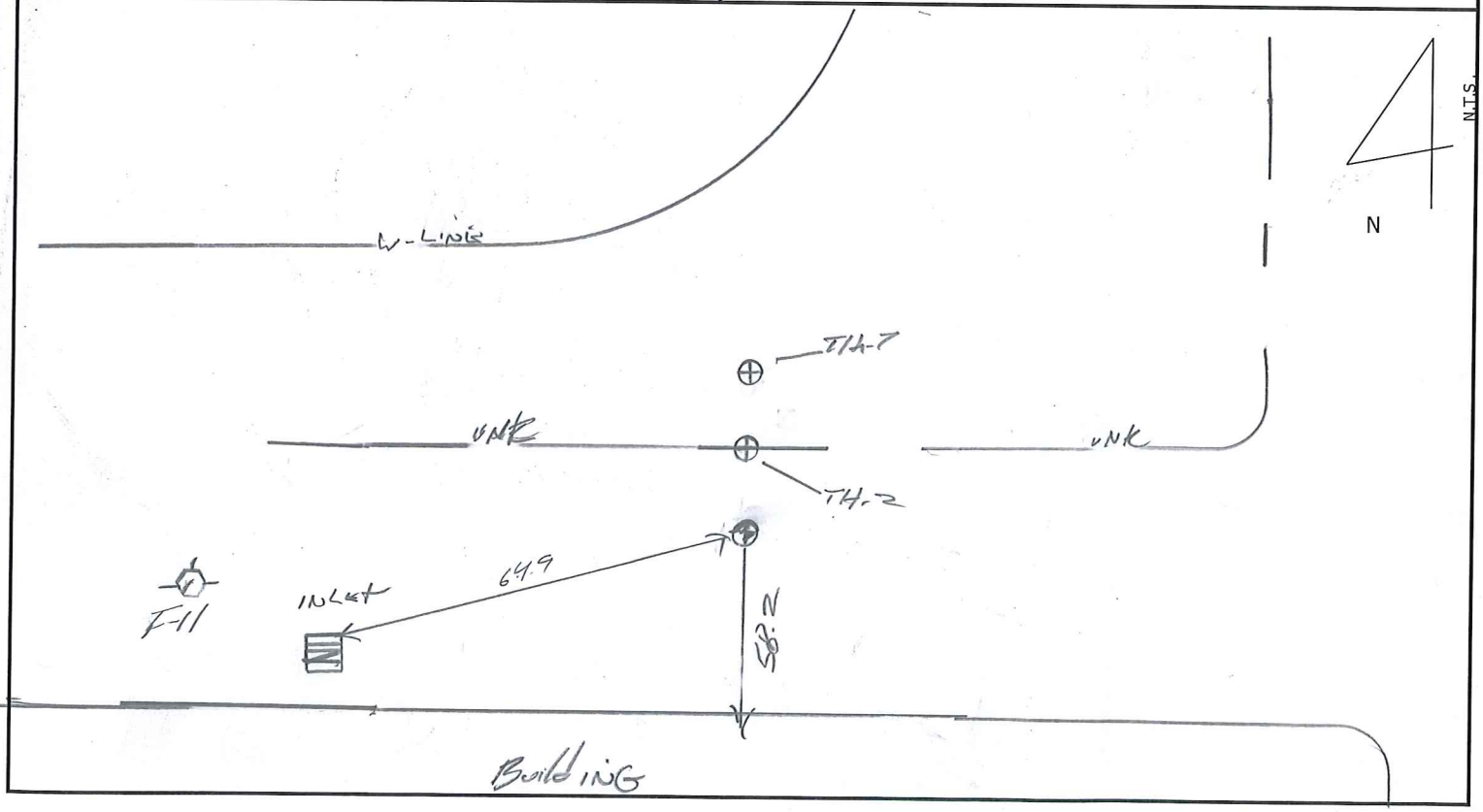
NOTES:
VAC AND Probed Southside of 16" UNK, Possible oil and GAS. No Lines Found beside or below



VACUUMED: 5' AIR LANCED: 10'

SURVEY PIN LOCATED BY:
STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



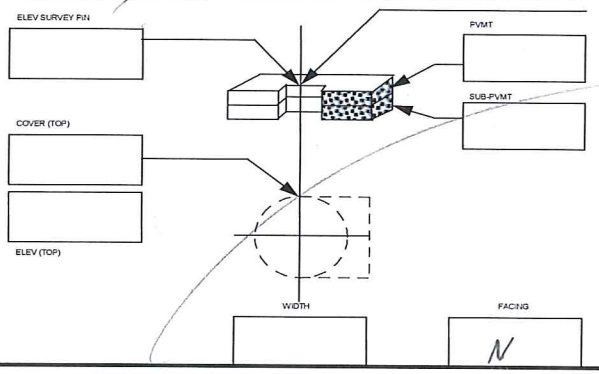
6/20/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17.027
Test Hole No.: 7

PROJECT NAME: Port of Manatee
JOB TYPE: (Locating) Designating
REQUESTED BY:
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: Oil+Gas
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK (N/A) OTHER: _____
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____
SIZE AS FOUND: SIZE EXPECTED: 12, 10, 10, 6
UTILTIY COLOR: 18



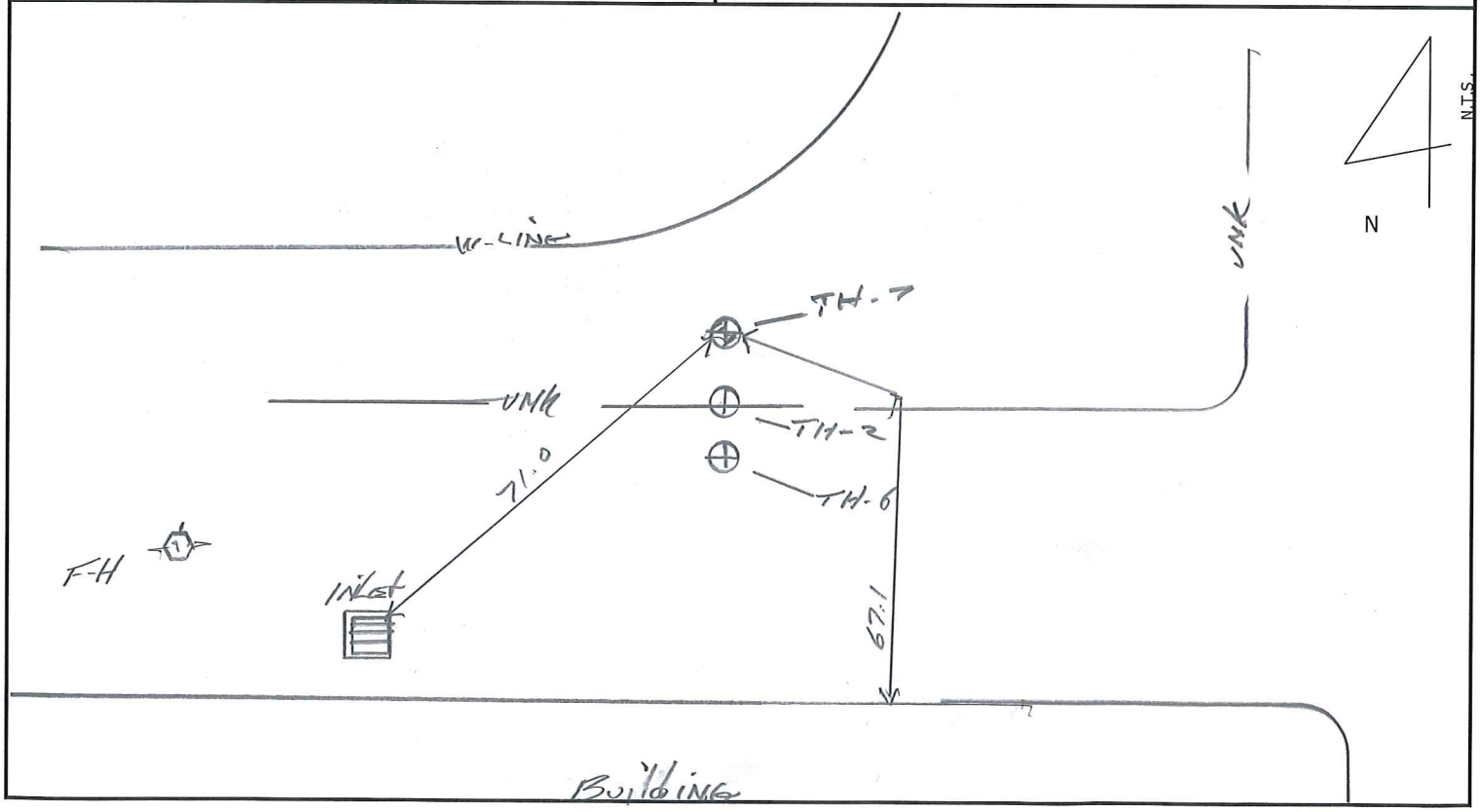
SURVEY PIN LOCATED BY:
STATION OFFSET: LT/RT

FPID: WORK ORDER No
Cover Estab By.: ML COVER CHECKED BY: PD
FORM BY: ML ASSITED BY: PD
NUMBER OF HOLES DUG: 3 TODAY'S DATE:
INSTALLED: HUB PIN CHISX (NAIL)
AT: CROWN or EDGE side of utility: E W S N
DIGITAL PHOTO (Y) N No. _____

NOTES: VAC AND probed Northside of 16" UNK. Possible oil AND GAS No other LINES beside or below

VACUUMED: 5' AIR LANCED: 10'

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



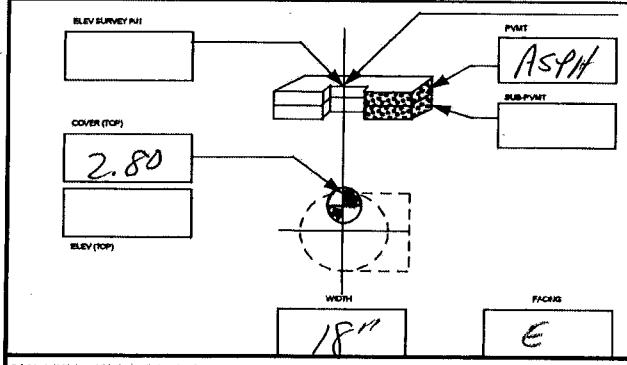
6/20/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

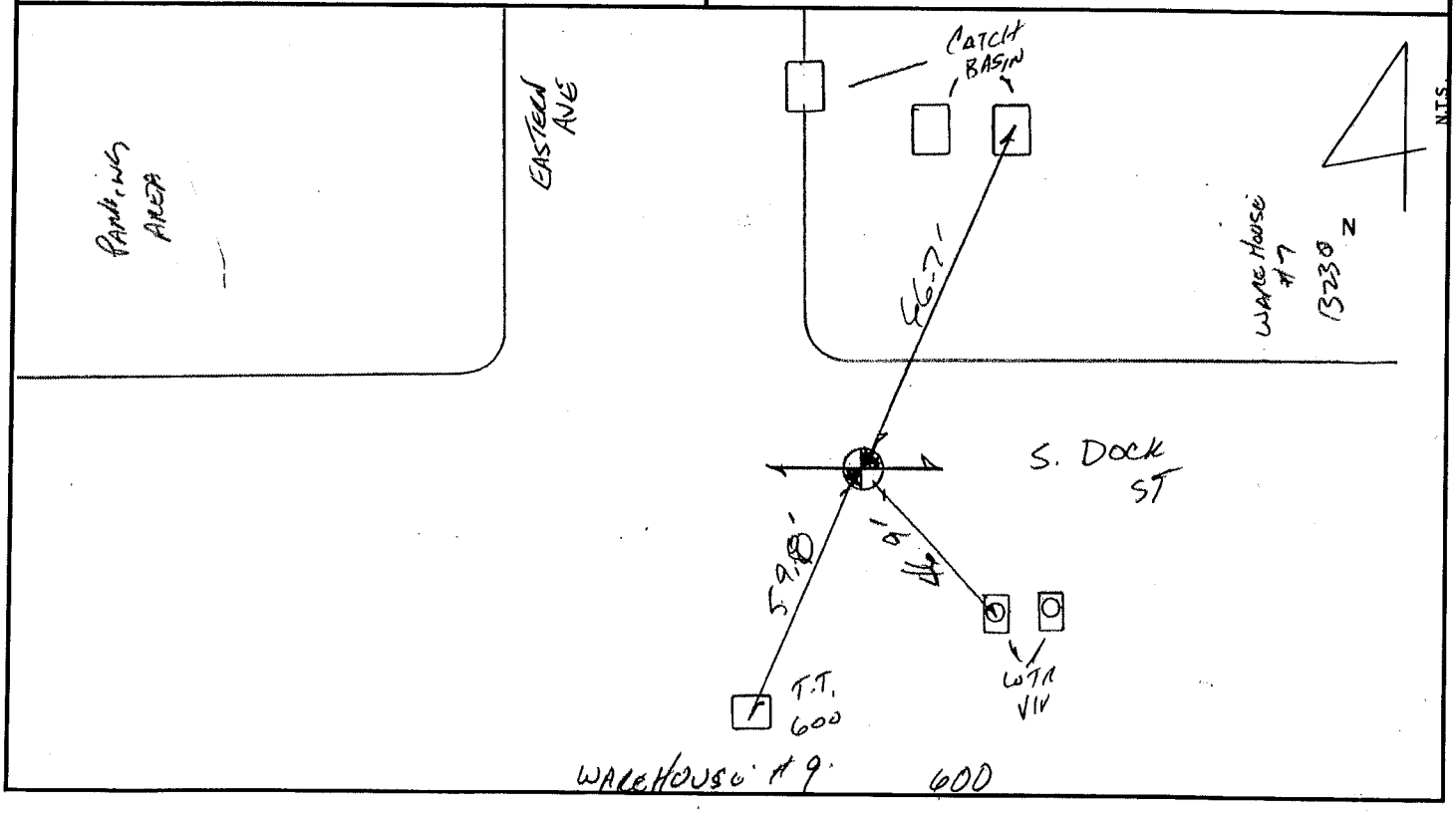
Omni Job No.: 33-17-061
Test Hole No.: 8

PROJECT NAME: Port of Manatee Forcemain Replacement	FPID: WORK ORDER No
JOB TYPE: (Locating) Designating	Cover Estab By. : AC COVER CHECKED BY: J Coleman
REQUESTED BY: FDC	FORM BY: PD ASSITED BY: KP
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: Oil Line	NUMBER OF HOLES DUG: TODAY'S DATE: 12/14/17
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: Oil Line	INSTALLED: HUB PIN CHISX (NAIL) AT: CROWN or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP ~~STL~~ W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	DIGITAL PHOTO Y N No. _____
SIZE AS FOUND: SIZE EXPECTED:	NOTES: FxD 18" STL O.L LINE
UTILTIY COLOR:	



Book 62 Pg 27

SURVEY PIN LOCATED BY: FDC	VACUUMED: AIR LANCED:
STATION OFFSET: LT/RT	THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



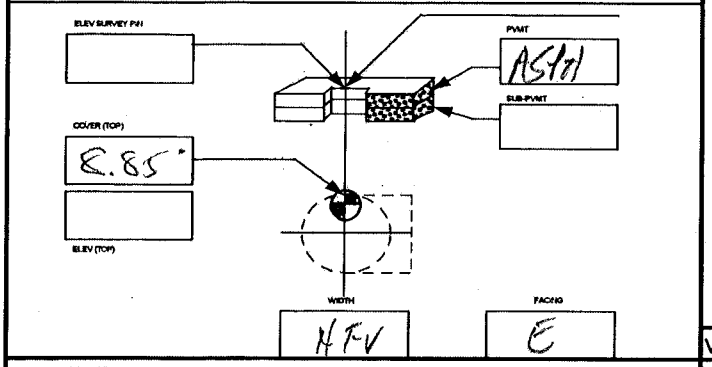
12/6/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-061
Test Hole No.: 9

PROJECT NAME: Port of Manatee Forcemain Replacement	**FPID:**
JOB TYPE: (Locating) Designating	**WORK ORDER No**
REQUESTED BY: FDC	**Cover Estab By. :** AC. **COVER CHECKED BY:** KSC
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: O/	**FORM BY:** PJ **ASSITED BY:**
	NUMBER OF HOLES DUG: 3 **TODAY'S DATE:** 12/18/17
	INSTALLED: HUB PIN CHISX (NAIL)
	AT: (CROWN) or EDGE side of utility: E W S N
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: O/	**DIGITAL PHOTO** (Y) N No.
MATERIAL AS FOUND: DIP CIP (STL) W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER	**NOTES:** NFV Size SEC O/ UNE Due to WTR
SIZE AS FOUND: NFV **SIZE EXPECTED:**	
UTILTIY COLOR:	



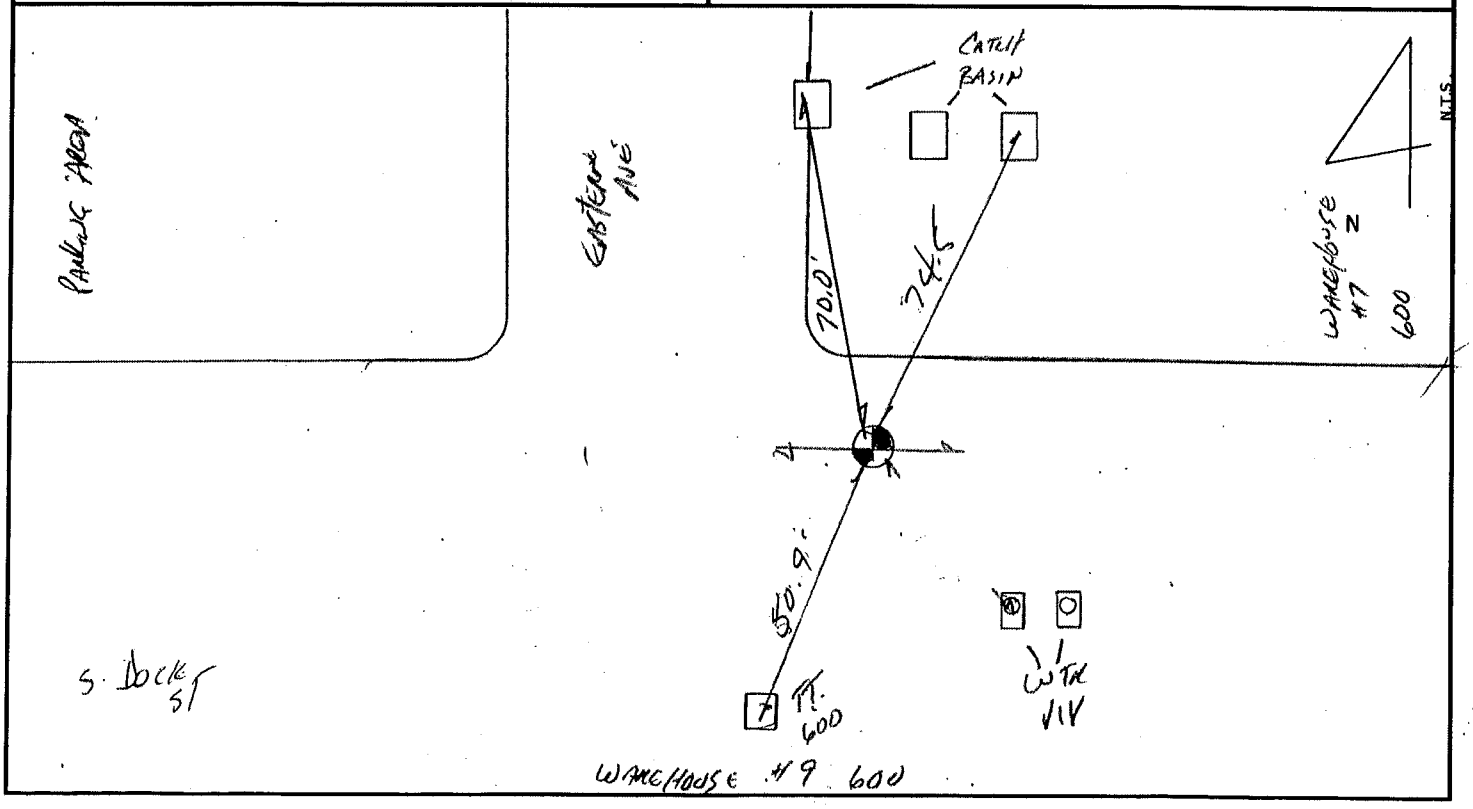
Book 62 Pg 27.

VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



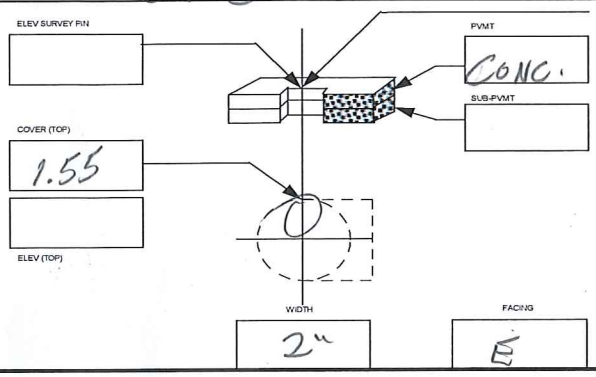
12/6/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 1

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** ML **COVER CHECKED BY:** JC
REQUESTED BY: FDC	**FORM BY:** ML **ASSITED BY:** JC
REQUESTED UTILITY: WATER RWM STORM SAN FM	**NUMBER OF HOLES DUG:** **TODAY'S DATE:**
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV	**INSTALLED:** HUB PIN (CHISX) NAIL
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**AT:** CROWN or EDGE side of utility: E W S N
LOCATED UTILITY: WATER RWM STORM SAN FM	**DIGITAL PHOTO** (Y) N No. : _____
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV	
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NOTES:** FOUND 2" PE GAS LINE
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP	
TILE TERRA-COTTA CONC ACP RCP PVC (PE) HDPE FOC	
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	
SIZE AS FOUND: 2" **SIZE EXPECTED:** 2"	
UTILTIY COLOR: ORANGE	

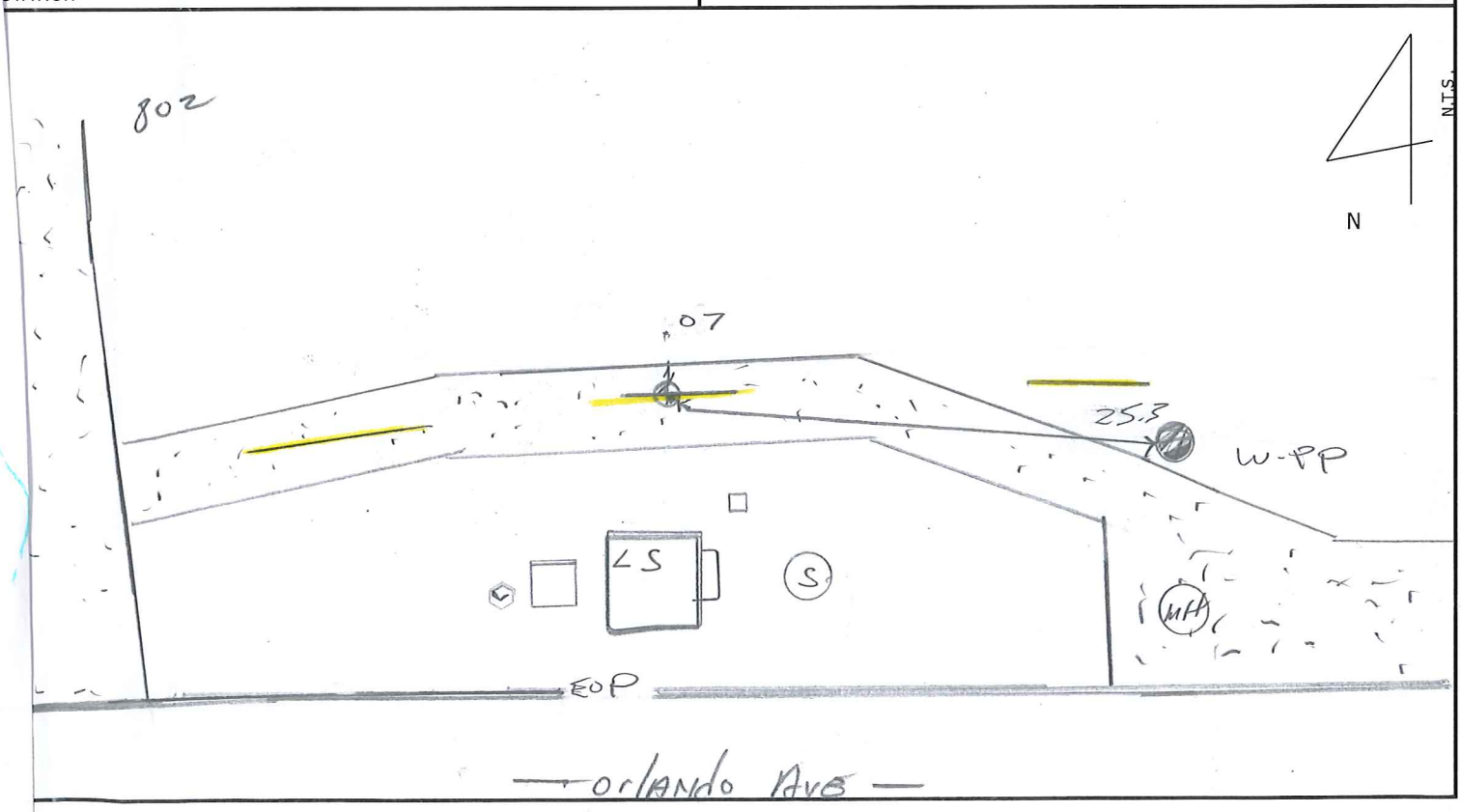


VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



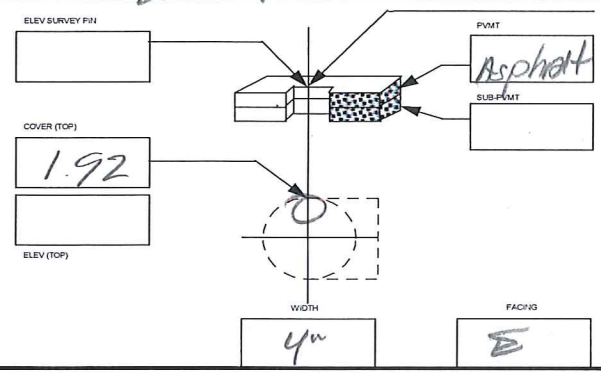
5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 2

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** ML **COVER CHECKED BY:** JC
REQUESTED BY: FDC	**FORM BY:** ML **ASSITED BY:** JC
REQUESTED UTILITY: (WATER) RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NUMBER OF HOLES DUG:** 1 **TODAY'S DATE:**
LOCATED UTILITY: (WATER) RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**INSTALLED:** (HUB) PIN CHISX (NAIL) **AT:** CROWN or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP (STL) W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP (PVC) PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**DIGITAL PHOTO** (Y) N No. _____
SIZE AS FOUND: 4" **SIZE EXPECTED:** 4"	**NOTES:** FOUND 4" PVC TO METAL WATER LINE
UTILTIY COLOR: BLUE + BLK	

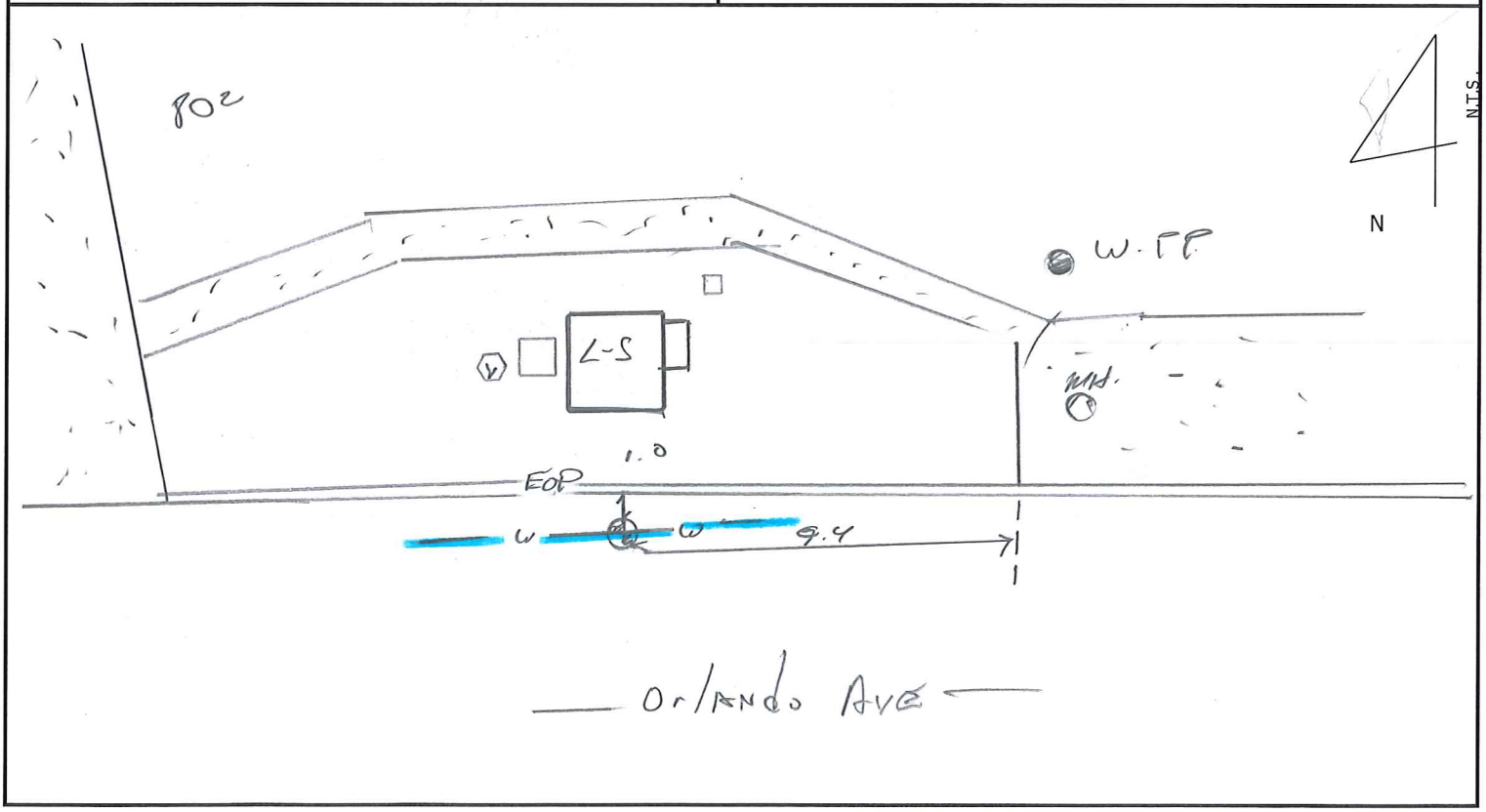


VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 3

PROJECT NAME: Orlando Ave FM Replacement
FPID: **WORK ORDER No**

JOB TYPE: Locating Designating
Cover Estab By. : ML **COVER CHECKED BY:** JC

REQUESTED BY: FDC
FORM BY: ML **ASSITED BY:** JC

REQUESTED UTILITY: WATER RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____
NUMBER OF HOLES DUG: **TODAY'S DATE:**

INSTALLED: HUB PIN CHISX NAIL
AT: CROWN or EDGE side of utility: E W S N

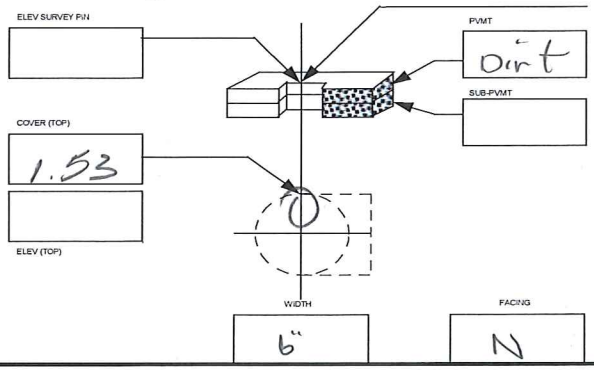
LOCATED UTILITY: WATER RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____
DIGITAL PHOTO Y N No. _____

NOTES: Found 6" ACP WL

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP
TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: 6" **SIZE EXPECTED:** 6"

UTILTIY COLOR: GRAY

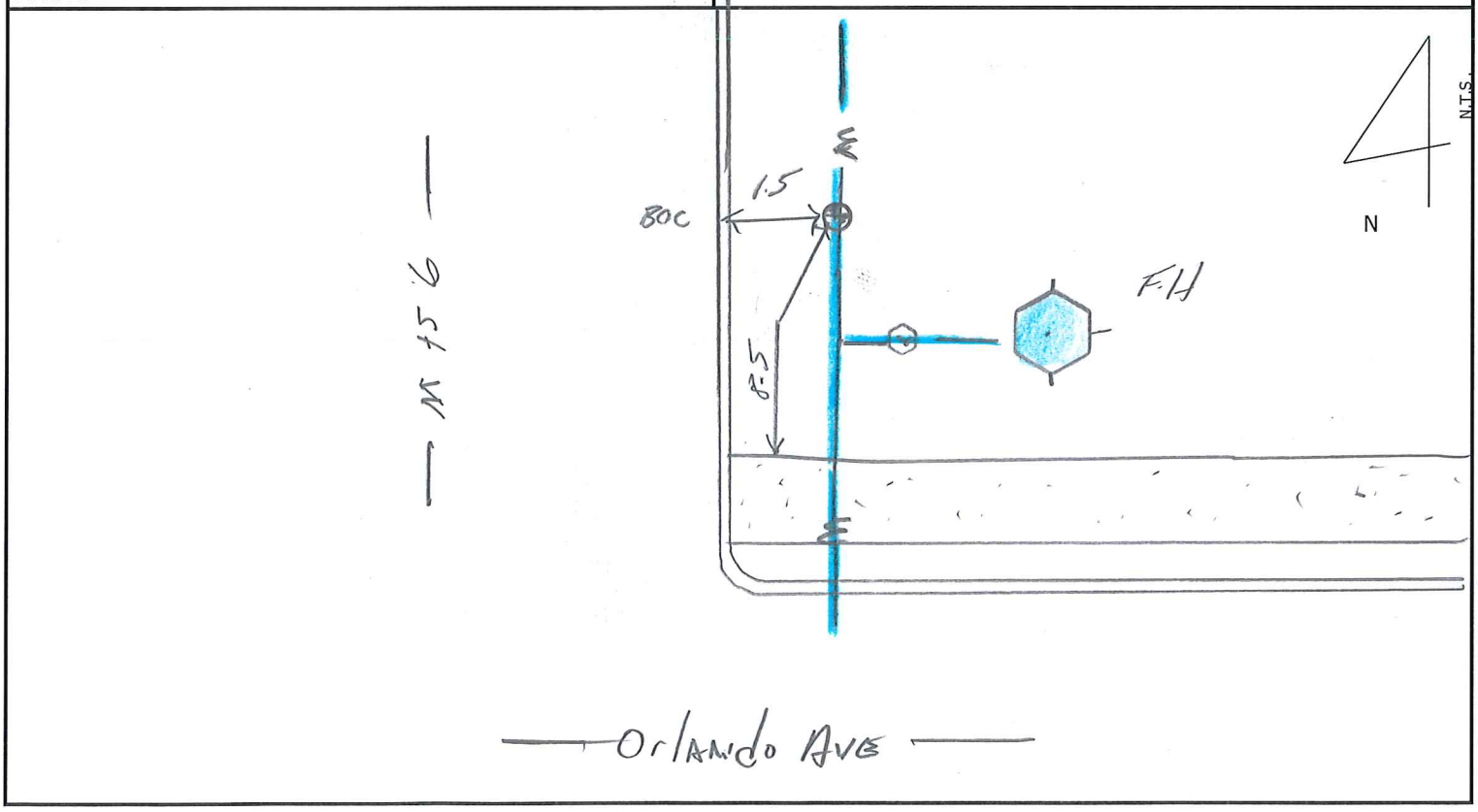


VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 4

PROJECT NAME: Orlando Ave FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

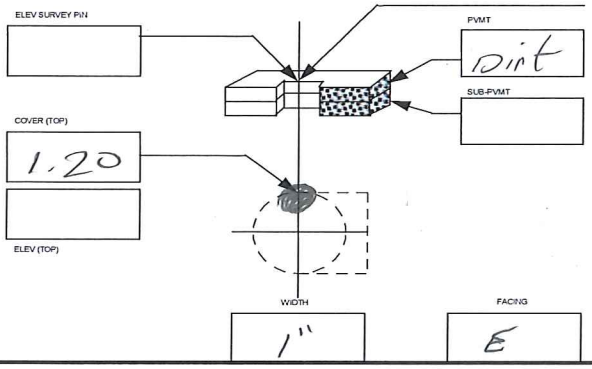
REQUESTED UTILITY: WATER RWM STORM SAN FM
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

LOCATED UTILITY: WATER RWM STORM SAN FM
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP
TILE TERRA-COTTA CONC ACP RCP PVC (PE) HDPE FOC
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: 1" **SIZE EXPECTED:** 2"

UTILTIY COLOR: Blk



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By. : ML **COVER CHECKED BY:** JC

FORM BY: ML **ASSITED BY:** JC

NUMBER OF HOLES DUG: 2 **TODAY'S DATE:**

INSTALLED: (HUB) PIN CHISX NAIL

AT: (CROWN) or EDGE side of utility: E W S N

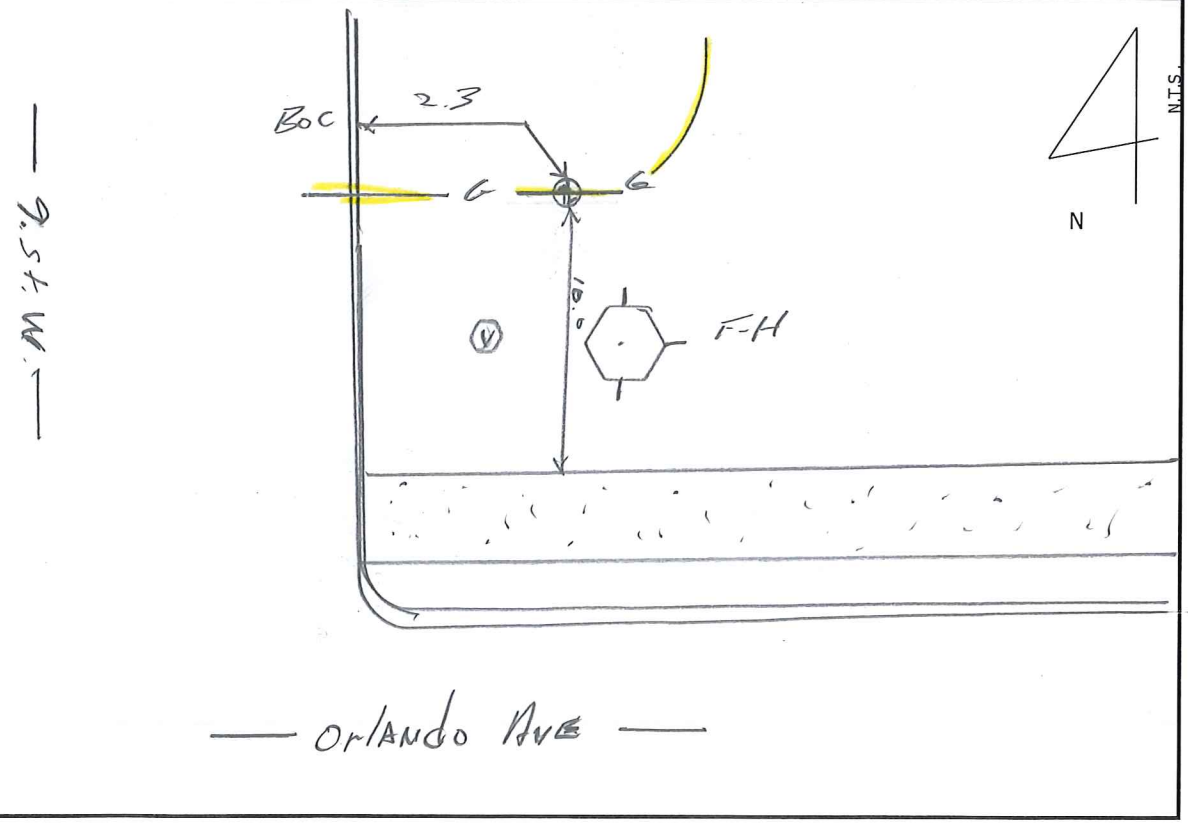
DIGITAL PHOTO (Y) N No. _____

NOTES:

Found 1" PE GAS
Has yellow TRACE WIRE
with it.

VACUUMED: AIR LANCED:

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



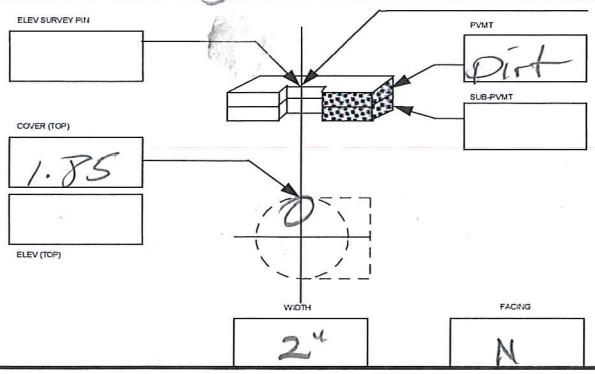
5/23/2017

Omni Communications
Subsurface Utility Engineering

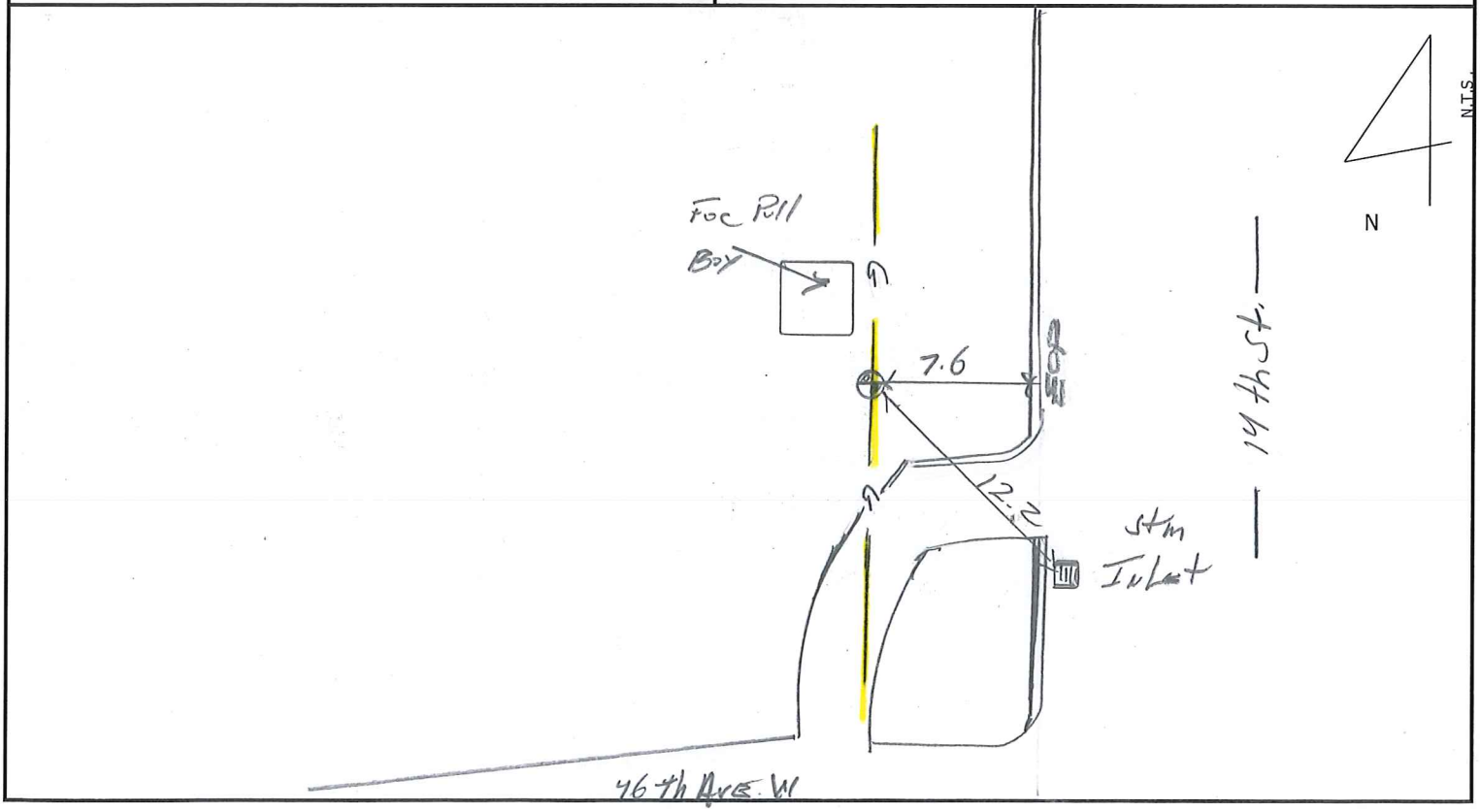
VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 5

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: Locating Designating	**Cover Estab By.:** ML **COVER CHECKED BY:** JC
REQUESTED BY: FDC	**FORM BY:** ML **ASSITED BY:** JC
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**NUMBER OF HOLES DUG:** 1 **TODAY'S DATE:** **INSTALLED:** HUB PIN CHISX NAIL **AT:** CROWN or EDGE side of utility: E W S N **DIGITAL PHOTO** Y N No.
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**NOTES:** Found 2" PE GAS
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER	
SIZE AS FOUND: 2" **SIZE EXPECTED:** 2"	
UTILTIY COLOR: ORANGE	



SURVEY PIN LOCATED BY: FDC	VACUUMED: AIR LANCED:
STATION OFFSET: LT/RT	THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 6

PROJECT NAME: Orlando Ave FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

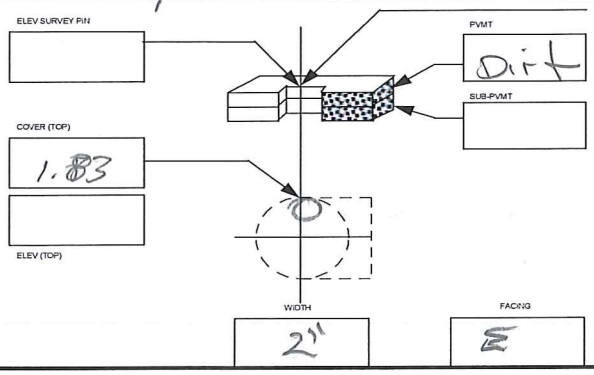
REQUESTED UTILITY: WATER RWM STORM SAN FM
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

LOCATED UTILITY: WATER RWM STORM SAN FM
(GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP
TILE TERRA-COTTA CONC ACP RCP PVC (PE) HDPE FOC
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: 2" **SIZE EXPECTED:** 2"

UTILTIY COLOR: Yellow



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By. : ML **COVER CHECKED BY:** JC

FORM BY: ML **ASSITED BY:** JC

NUMBER OF HOLES DUG: 1 **TODAY'S DATE:**

INSTALLED: (HUB) PIN CHISX NAIL

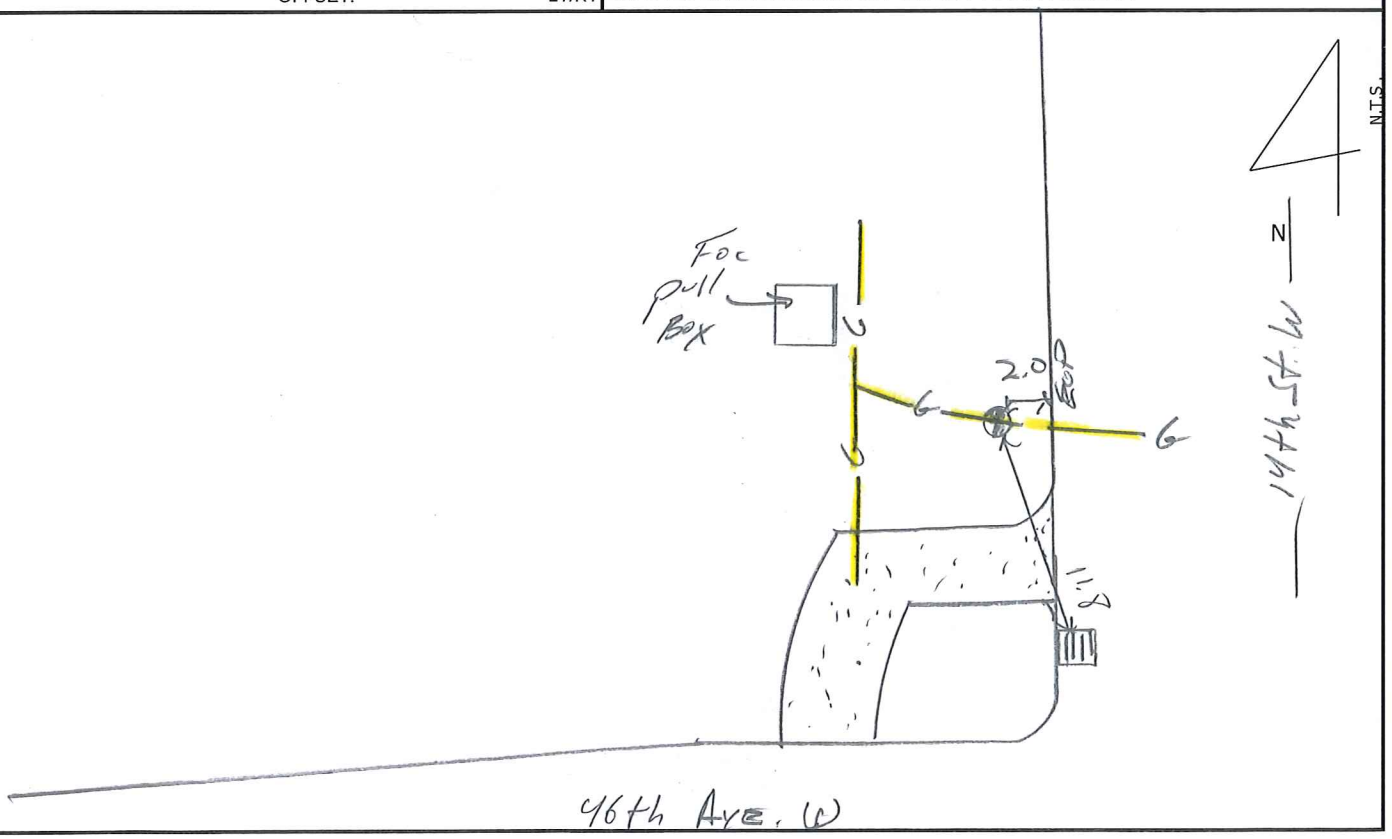
AT: (CROWN) or EDGE side of utility: E W S N

DIGITAL PHOTO (Y) N No. _____

NOTES: Found 2" PE GAS. LINE

VACUUMED: AIR LANCED:

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 7

PROJECT NAME: Orlando Ave FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

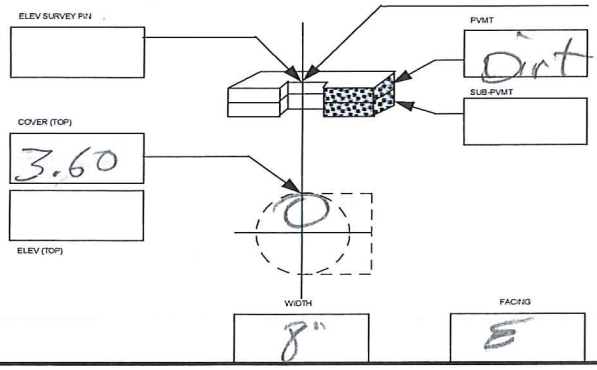
REQUESTED UTILITY: (WATER) RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

LOCATED UTILITY: (WATER) RWM STORM SAN FM
GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV
ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP
TILE TERRA-COTTA CONC ACP RCP (PVC) PE HDPE FOC
DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: 8" **SIZE EXPECTED:** 8"

UTILTIY COLOR: BLUE



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By. : MC **COVER CHECKED BY:** JC

FORM BY: MC **ASSITED BY:** JC

NUMBER OF HOLES DUG: 1 **TODAY'S DATE:**

INSTALLED: (HUB) PIN CHISX NAIL

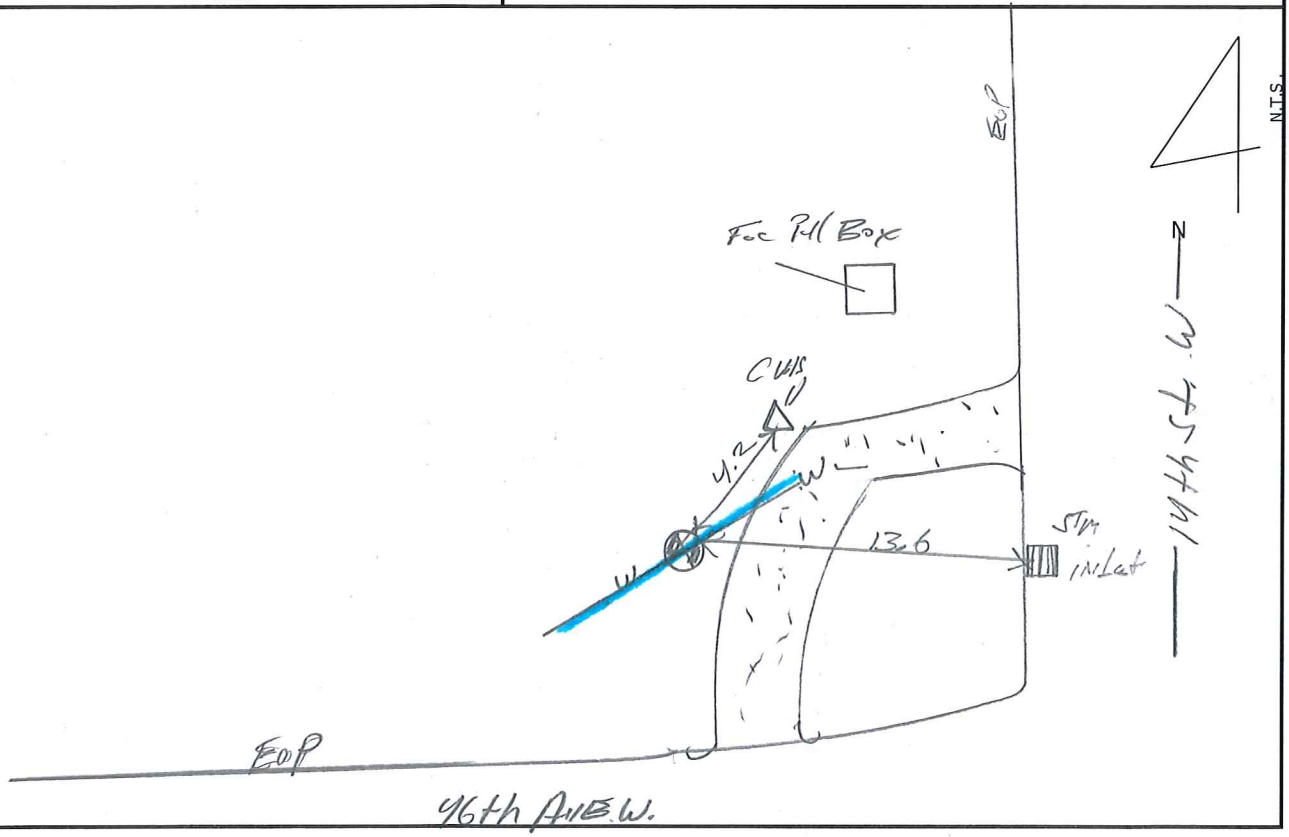
AT: (CROWN) or EDGE side of utility: E W S N

DIGITAL PHOTO (Y) N No. _____

NOTES: FOUND 8" PVC W-LINE

VACUUMED: AIR LANCED:

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 8

PROJECT NAME: Orlando Ave FM Replacement

JOB TYPE: (Locating) Designating

REQUESTED BY: FDC

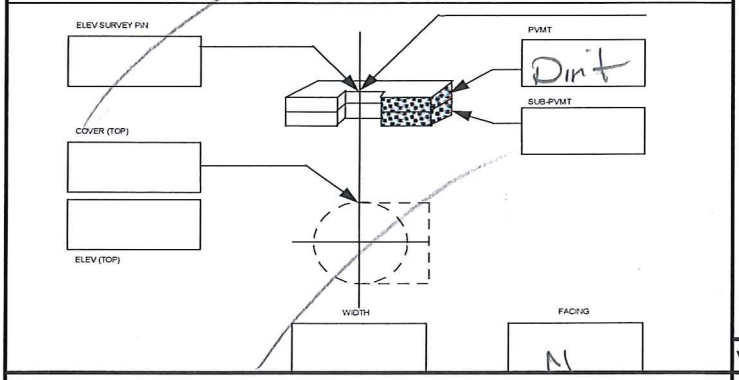
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____

LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION (EXPLORE) UNK N/A OTHER: _____

MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____

SIZE AS FOUND: **SIZE EXPECTED:**

UTILTIY COLOR:



SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

FPID: **WORK ORDER No**

Cover Estab By. : MG **COVER CHECKED BY:** JC

FORM BY: MG **ASSITED BY:** JC

NUMBER OF HOLES DUG: 3 **TODAY'S DATE:**

INSTALLED: HUB PIN CHISX NAIL

AT: CROWN or EDGE side of utility: E W S N

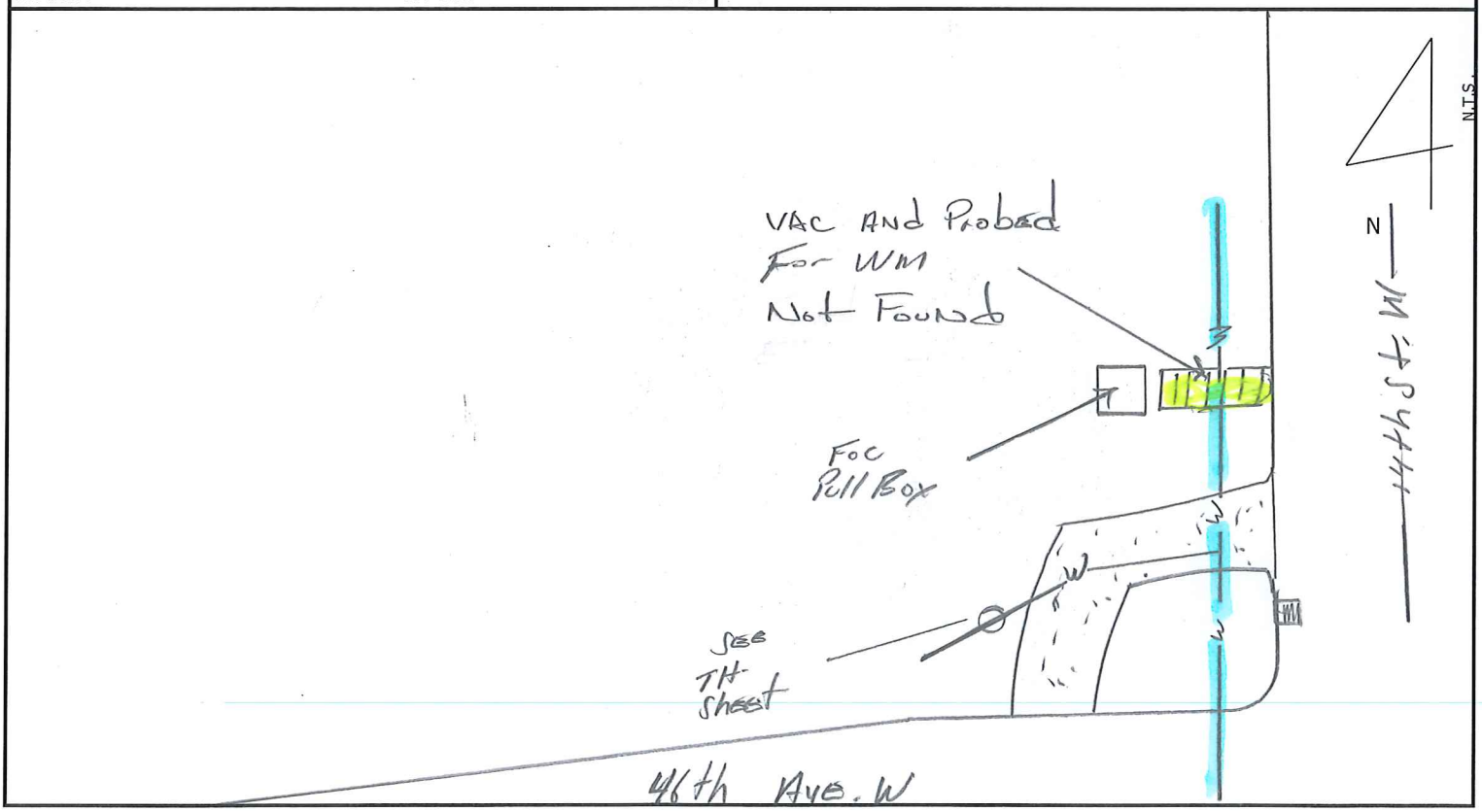
DIGITAL PHOTO Y N No. _____

NOTES:

VAC AND Probed Both sides of WM 1-CALL Marks (Not Found.)
GPR Not Detecting - Bad Grd Conditions, Shell, Hard Layers Will Take VAC. Some time To Locate

VACUUMED: 3' AIR LANCED: 10'

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



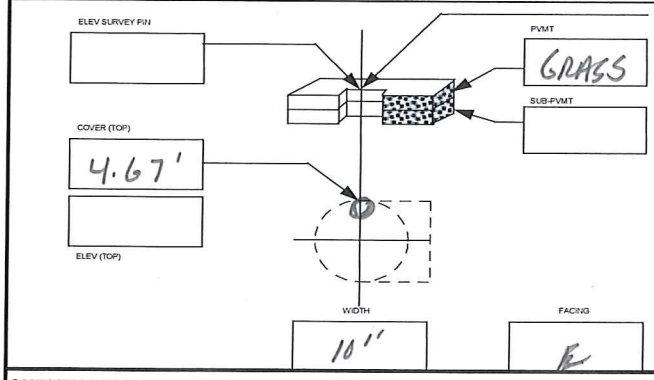
5/23/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 9

PROJECT NAME: Orlando Ave. FM Replacement	**FPID:** N/A **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** PD **COVER CHECKED BY:** SH
REQUESTED BY: FDC	**FORM BY:** SH **ASSITED BY:** PD
REQUESTED UTILITY: WATER RWM STORM SAN (FM) GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: ____	**NUMBER OF HOLES DUG:** 1 **TODAY'S DATE:** 6/8/17
LOCATED UTILITY: WATER RWM STORM SAN (FM) GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: ____	**INSTALLED:** (HUB) PIN CHISX NAIL **AT:** (CROWN) or EDGE side of utility: E W S N
MATERIAL AS FOUND: (DIP) CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER ____	**DIGITAL PHOTO** (Y) N No. ____
SIZE AS FOUND: 10" **SIZE EXPECTED:**	**NOTES:** FND 10" DIP FM
UTILTIY COLOR:	

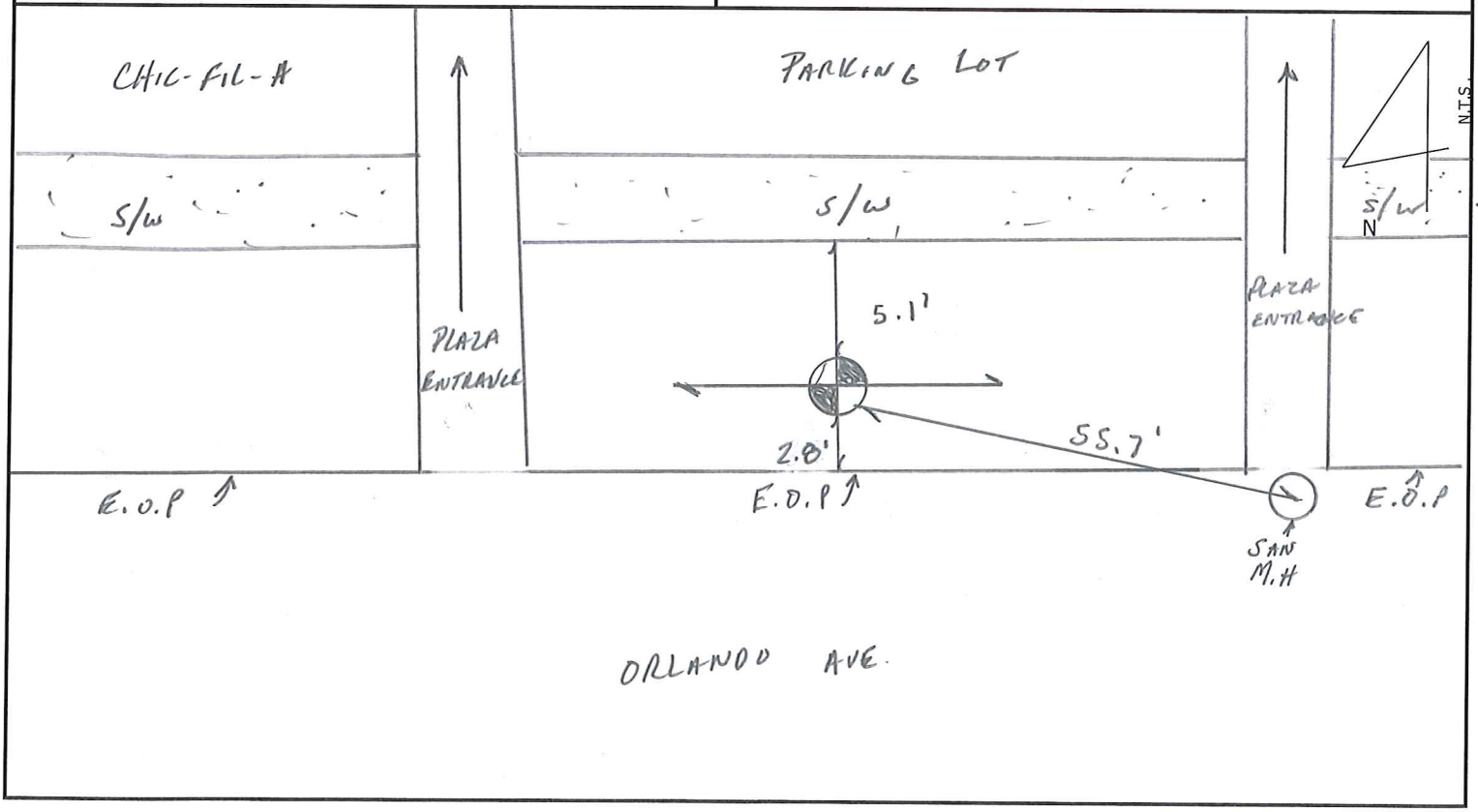


VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.

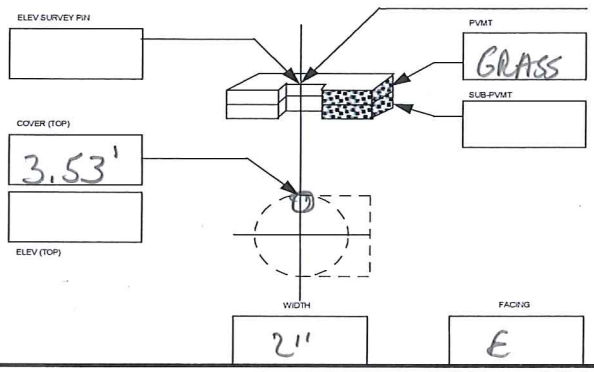


Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-028
Test Hole No.: 10

PROJECT NAME: Orlando Ave. FM Replacement	**FPID:** N/A **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** PD **COVER CHECKED BY:** SH
REQUESTED BY: FDC	**FORM BY:** SH **ASSITED BY:** PD
REQUESTED UTILITY: WATER RWM STORM SAN FM (GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NUMBER OF HOLES DUG:** 1 **TODAY'S DATE:** 6/8/17
LOCATED UTILITY: WATER RWM STORM SAN FM (GAS) ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**INSTALLED:** (HUB) PIN CHISX NAIL **AT:** (CROWN) or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC (PE) HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**DIGITAL PHOTO** (Y) N No. _____
SIZE AS FOUND: 2" **SIZE EXPECTED:**	**NOTES:** FND 2" PE GAS
UTILTIY COLOR:	

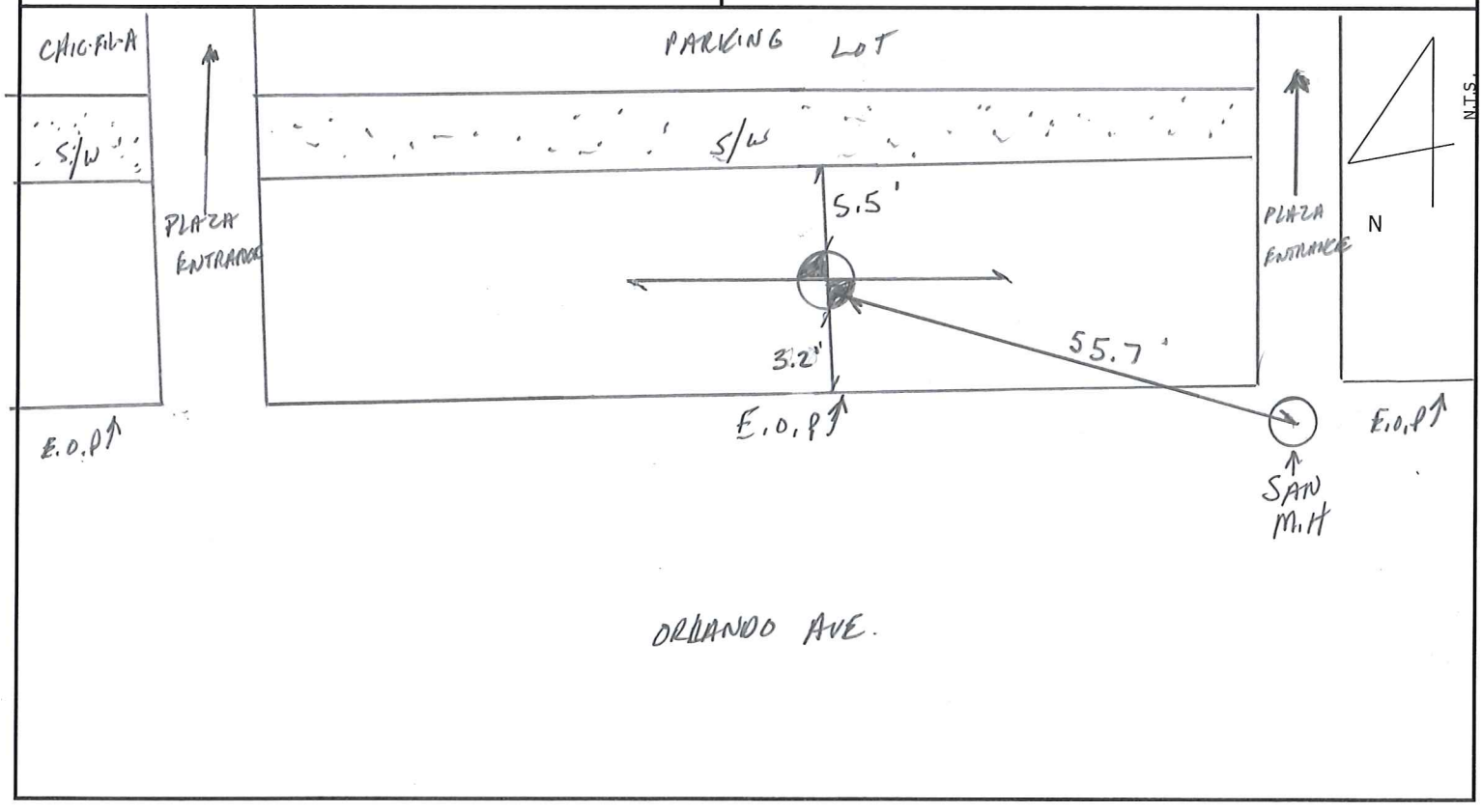


VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.

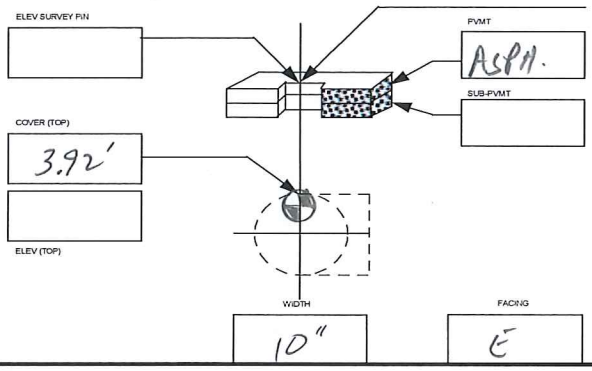


Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-063
Test Hole No.: 11

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: Locating Designating	**Cover Estab By. :** A.C. **COVER CHECKED BY:** J Coleman
REQUESTED BY: FDC	**FORM BY:** PD **ASSITED BY:** KP
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NUMBER OF HOLES DUG:** **TODAY'S DATE:** 12/13/17
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**INSTALLED:** HUB PIN CHISX NAIL **AT:** CROWN or EDGE side of utility: E W S N **DIGITAL PHOTO** Y N No. _____
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**NOTES:** FND 10" DIP FM
SIZE AS FOUND: 10" **SIZE EXPECTED:**	
UTILTIY COLOR: Black	



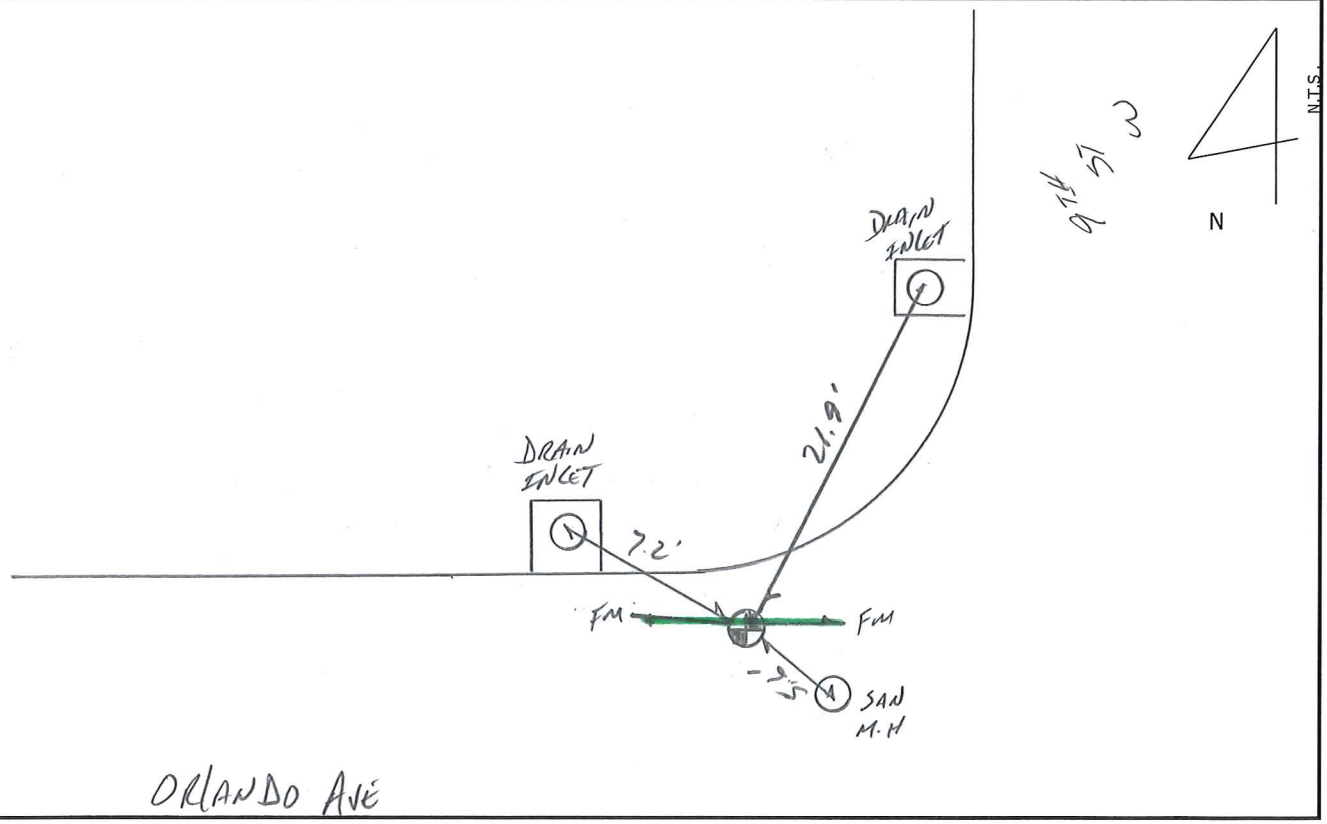
BOOK - OMNI 2 PG 30

VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.

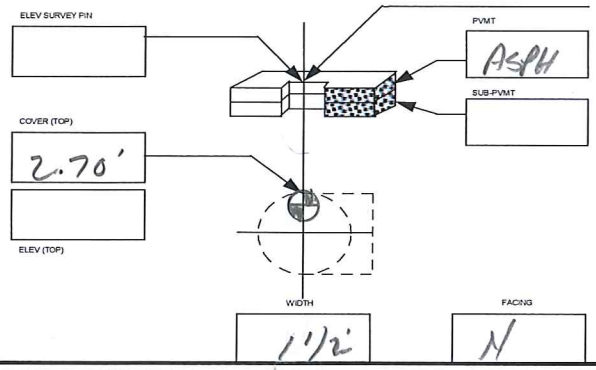


Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-063
Test Hole No.: 12

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: Locating Designating	**Cover Estab By. :** AC **COVER CHECKED BY:** J. COLEMAN
REQUESTED BY: FDC	**FORM BY:** PD **ASSITED BY:** KP
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**NUMBER OF HOLES DUG:** **TODAY'S DATE:** 12/13/17
	INSTALLED: HUB PIN CHISX NAIL
	AT: CROWN or EDGE side of utility: E W S N
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**DIGITAL PHOTO** Y N No.
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER	**NOTES:** FND 1 1/2" PE FOC
SIZE AS FOUND: 1 1/2" **SIZE EXPECTED:**	
UTILTIY COLOR:	



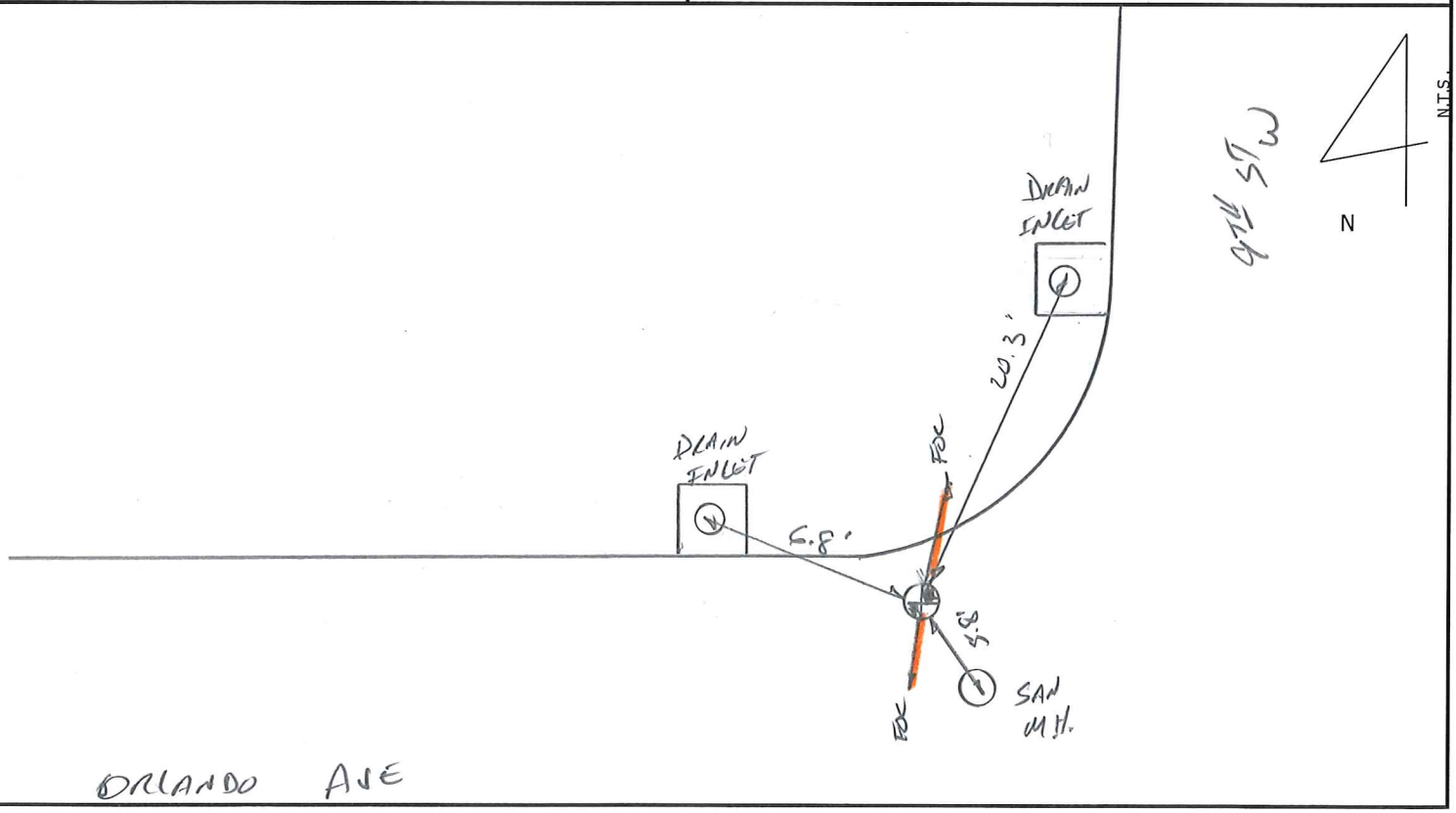
BOOK - OMNI 2 PG. 30

VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



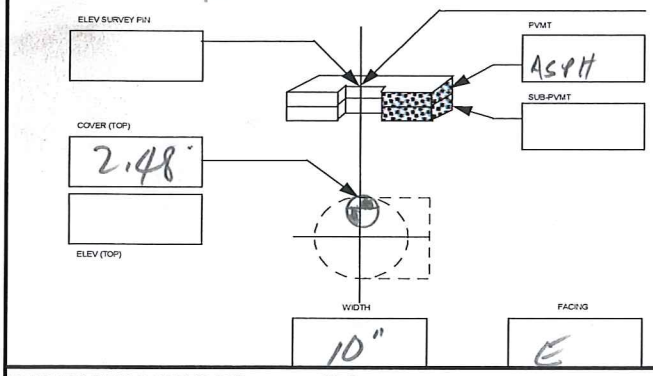
12/6/2017

Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-063
Test Hole No.: 13

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: Locating Designating	**Cover Estab By. :** AE **COVER CHECKED BY:** J. Coleman
REQUESTED BY: FDC	**FORM BY:** DD **ASSITED BY:** KP
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**NUMBER OF HOLES DUG:** **TODAY'S DATE:** 12/13/17
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**INSTALLED:** HUB PIN CHISX NAIL **AT:** CROWN or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER	**DIGITAL PHOTO** Y N No.
SIZE AS FOUND: 10" **SIZE EXPECTED:**	**NOTES:** FND 10" DIP FM
UTILTIY COLOR: BLACK	



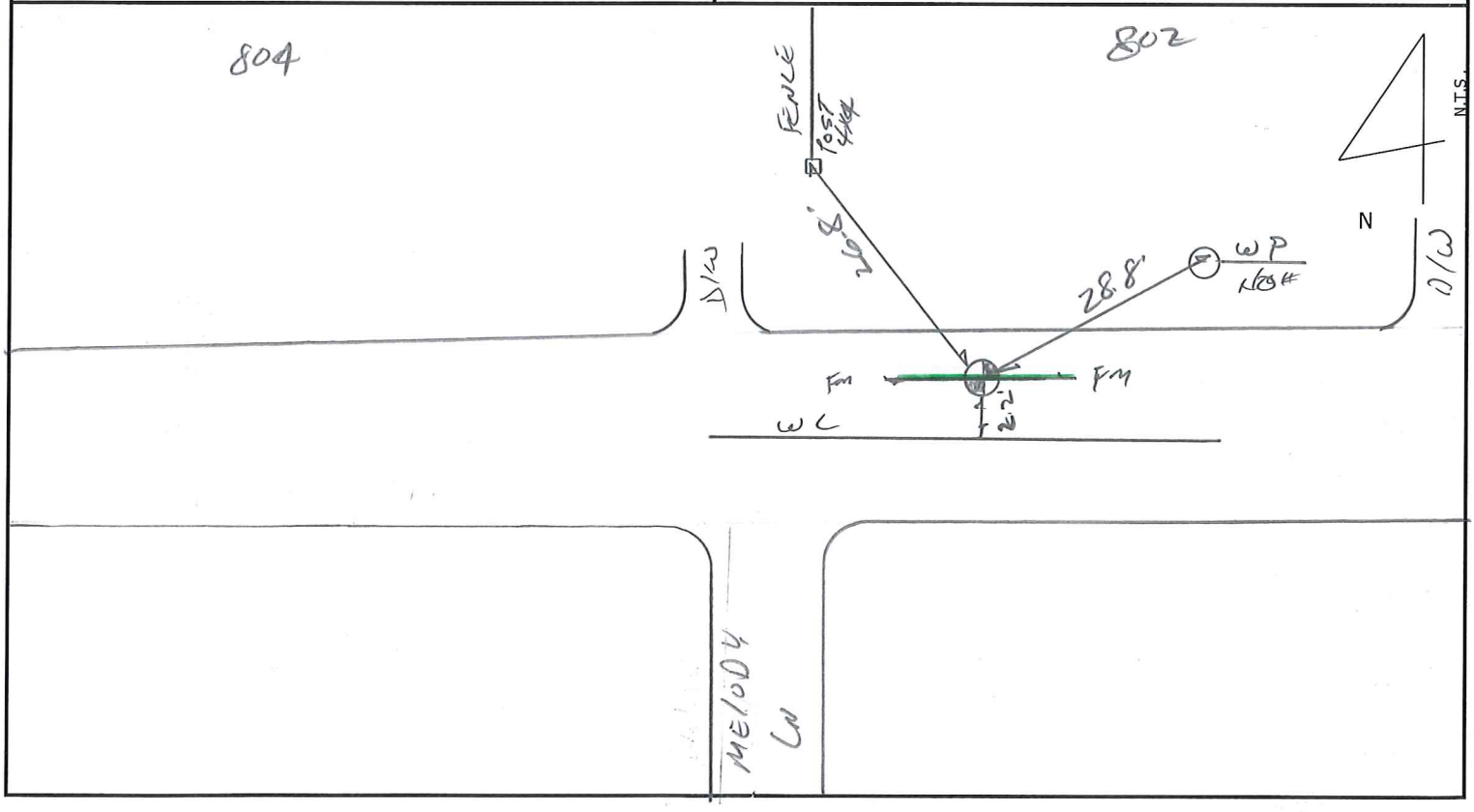
Book - OMNI 2 Pg-31

VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.

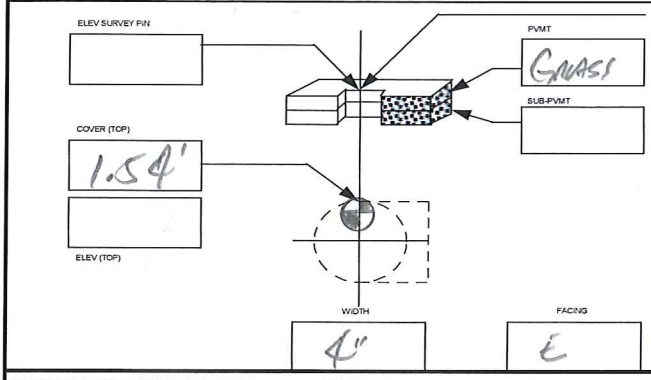


Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-063
Test Hole No.: 14

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: Locating Designating	**Cover Estab By. :** AC **COVER CHECKED BY:** J. COLEMAN
REQUESTED BY: FDC	**FORM BY:** RD **ASSITED BY:** KP
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**NUMBER OF HOLES DUG:** **TODAY'S DATE:** 12/13/17
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER:	**INSTALLED:** HUB PIN CHISX NAIL **AT:** CROWN or EDGE side of utility: E W S N
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER	**DIGITAL PHOTO** Y N **No.**
SIZE AS FOUND: 4" **SIZE EXPECTED:**	**NOTES:** Found 4" PVC WC
UTILTIY COLOR: White	



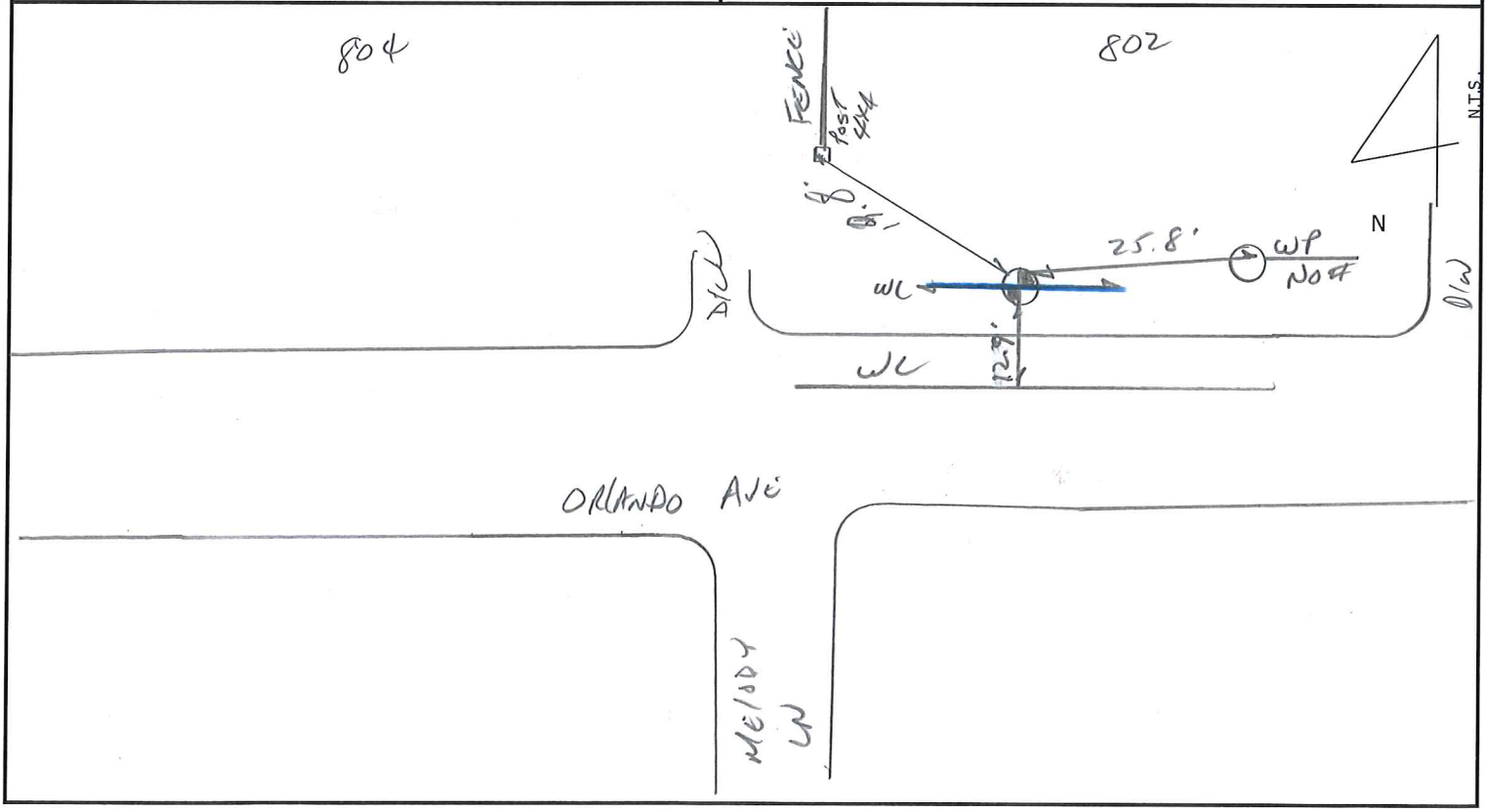
Book - OMNI 2 Pg - 31

VACUUMED: AIR LANCED:

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.

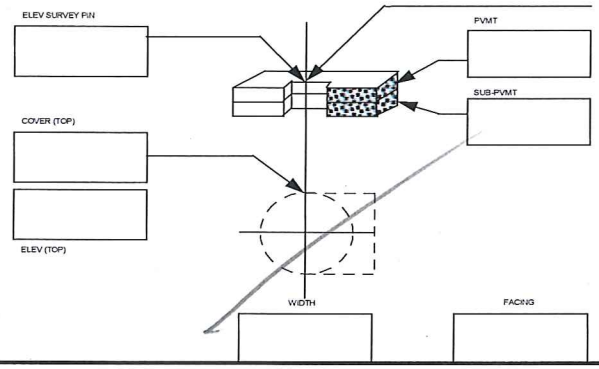


Omni Communications
Subsurface Utility Engineering

VACUUM TEST HOLE REPORT

Omni Job No.: 33-17-063
Test Hole No.: 15

PROJECT NAME: Orlando Ave FM Replacement	**FPID:** **WORK ORDER No**
JOB TYPE: (Locating) Designating	**Cover Estab By. :** A.C. **COVER CHECKED BY:** J Coleman
REQUESTED BY: FDC	**FORM BY:** PS **ASSITED BY:** K.P
REQUESTED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**NUMBER OF HOLES DUG:** **TODAY'S DATE:** 12/13/17
	INSTALLED: (HUB) PIN CHISX NAIL
	AT: CROWN or EDGE side of utility: E W S N
LOCATED UTILITY: WATER RWM STORM SAN FM GAS ELEC ST-LIGHTS TRAFF-SIG. ITS FOC TEL CATV ITS IRRIGATION EXPLORE UNK N/A OTHER: _____	**DIGITAL PHOTO** (Y) N No. _____
MATERIAL AS FOUND: DIP CIP STL W/STL EXY/STL CMP VXCP TILE TERRA-COTTA CONC ACP RCP PVC PE HDPE FOC DUCT-SYS DB.CABLE SPLICE CONC-CAP UNK N/A OTHER _____	**NOTES:** NO DETECTION ON WTR LINE 810 - GIR - NO
SIZE AS FOUND: **SIZE EXPECTED:**	
UTILTIY COLOR:	



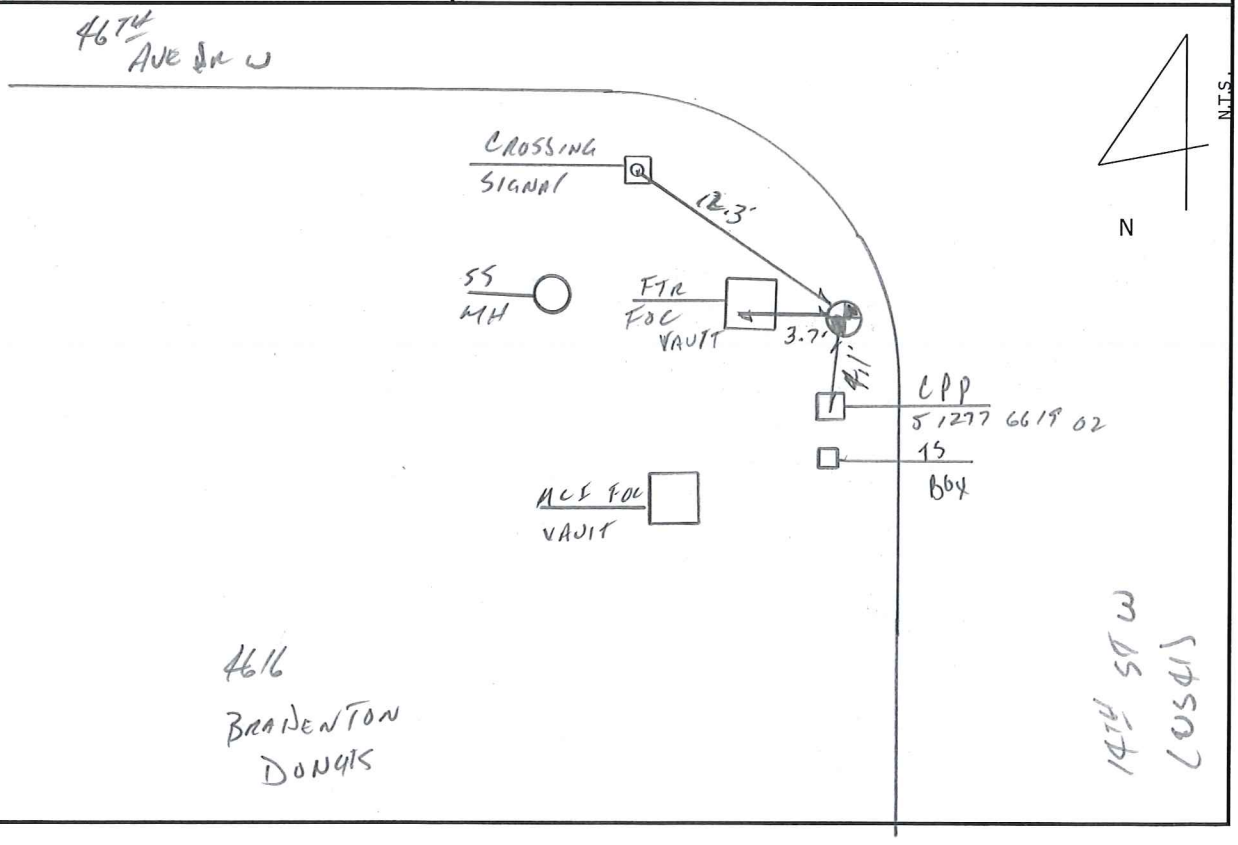
BOOK - OMNI 2 PG - 32

VACUUMED: 5' AIR LANCED: 10'

SURVEY PIN LOCATED BY: FDC

STATION OFFSET: LT/RT

THE GRAPHIC REPRESENTATION OF THE TEST HOLE DEPICTED HEREON DOES NOT PURPORT TO BE A SURVEY.



APPENDIX D – ENVIRONMENTAL REPORTS

5801 Benjamin Center Drive, Suite 112
Tampa, FL 33634
phone: 813.886.1075
fax: 813.249.4916
intertek.com/building
psiusa.com

November 13, 2017

Manatee County Government
Public Works Department
1022 26th Avenue East
Bradenton, Florida 34208

Attn: Michael L. Sturm, P.E.
Project Manager – Manatee County Public Works
Michael.sturm@mymanatee.org
941-708-7450, ext. 7332

Re: Letter Report
Environmental Assessment to Support Utility Construction
Port of Manatee Utility Project
Contract #16-0759CP
Professional Environmental Services
Bradenton, Manatee County, Florida

Dear Mr. Sturm:

As per the terms of our contract, Professional Service Industries, Inc. (PSI) has prepared this Letter Report detailing the environmental assessment work supporting the utility work for the Port of Manatee Utility Project referenced above. This report is being transmitted via email only.

Due to a concern of potential facility related contamination along the planned utility corridor PSI conducted a review of site files and identified areas of concern at five locations at the Port Facility in Bradenton, Florida. PSI performed an assessment of the soil and groundwater in these areas on October 25, 2017.

SOIL ASSESSMENT ACTIVITES

PSI supervised the advancement of five (5) soil sample borings to a depth of approximately 10 - 12 feet below land surface (ft bls) along the route of the planned utility corridor. The soil sample locations were labeled as SB-1, SB-2, SB-3, SB-4, and SB-5. Samples were collected from each boring location in 1-foot intervals, visually inspected, logged, and screened with an Organic Vapor Analyzer/Photoionization Detector for potential contamination. Elevated OVA readings greater than 1 parts per million were detected at each soil boring location at approximately 8 feet below land surface (ft bls).

Based on OVA readings soil samples were collected from each boring at two or three depth intervals for testing by laboratory analysis. The samples were analyzed by the following EPA Methods: 8260B for VOCs, 8270D for SVOCs, 8081 for Pesticides, 8082 for PCBs, 6010 for RCRA metals, and FDEP method FL-PRO for TPH. Laboratory results show an exceedance of the FDEP soil cleanup target level (SCTL) for metals (arsenic) at each of the boring locations.

GROUNDWATER ASSESSMENT ACTIVITES

PSI collected screen point (SP) groundwater samples from each of the locations. The depth to groundwater at boring locations was approximately 5 to 8 ft bls and groundwater samples were collected in varying intervals. Each sample was analyzed by the following EPA Methods: 8260B for VOCs, 8270D for SVOCs, 8081 for Pesticides, 8082 for PCBs, 6010 for RCRA metals, and FDEP method FL-PRO for TPH. Laboratory results show exceedances for petroleum constituents and arsenic at SB-1 and arsenic at each location above the applicable FDEP groundwater cleanup target levels (GCTLs).

The approximate location of the samples is provided on the figure in **Attachment A** and field notes and logs are provided in **Attachment B**. The Laboratory Report is provided in **Attachment C** and photographs of the field work is provided in **Attachment D**. The soil and groundwater samples were analyzed by ENCO Laboratories (National Environmental Laboratory Accreditation Program ID# E83182). Quality Control and Assurance analysis was included with the sample analysis and no issues were reported. Samples were collected according to Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (DEP-SOP001/01) for soils (FS 3000) and groundwater (FS 2200). Prior to site work PSI notified Sunshine Locate to identify underground utilities (Ticket #291710037) and met onsite with Port Facility personnel.

CONCLUSIONS & RECOMMENDATIONS

PSI completed an environmental assessment of soils and groundwater at five locations at the Port of Manatee Facility in Bradenton, Florida along the planned utility corridor. Laboratory test results indicate groundwater and soil contamination at each location exceeding one or more applicable CTLs. PSI recommends further discussion regarding the management of potential contaminated soils and groundwater during construction activities of the planned utility corridor.

Should you have any questions feel free to contact either the project manager or contract manager.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.

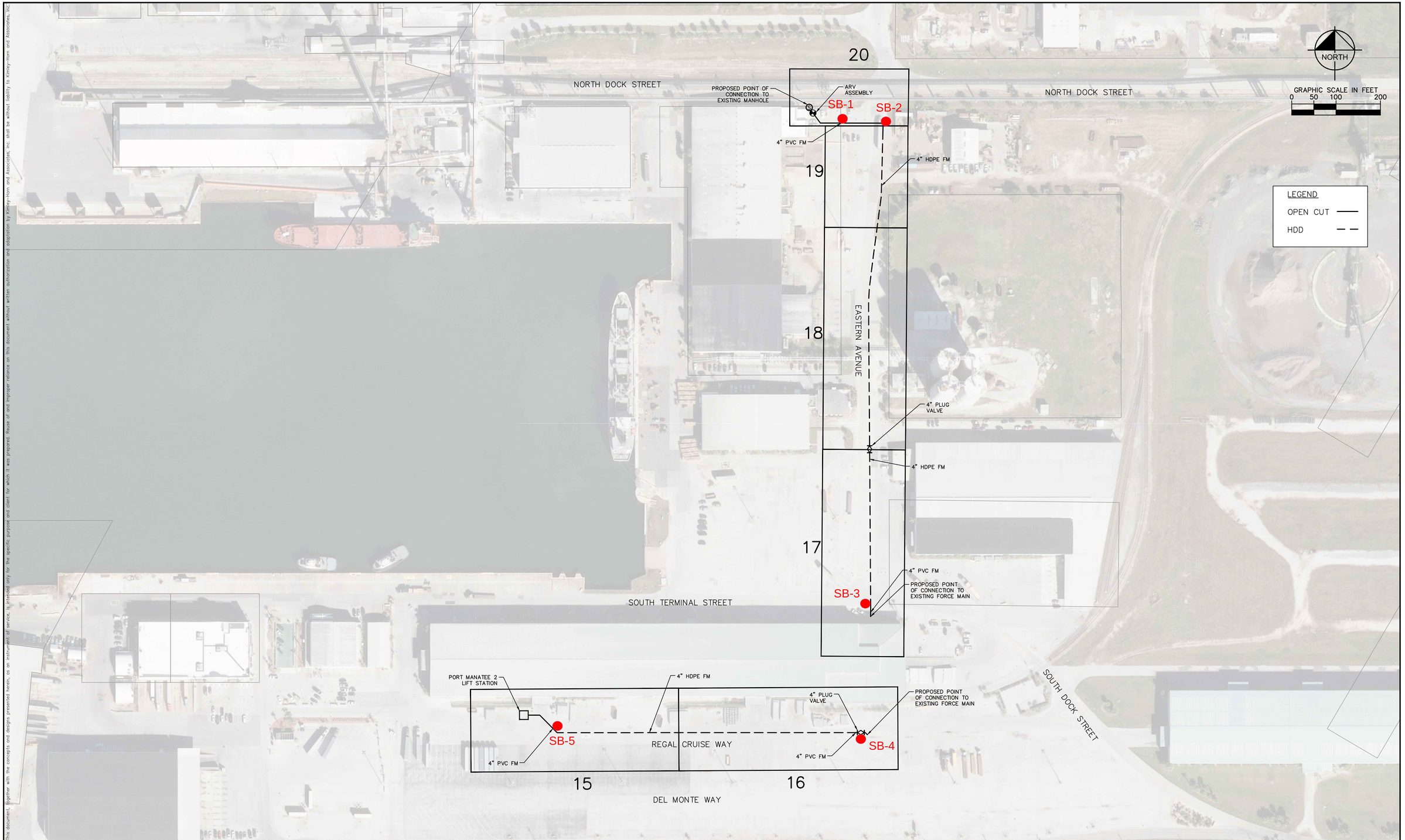
Benedict Marshall P.E.
Project Manager

Michael Rothenburg, P.E.
Contract Manager

Attachments:
- A – Sample Location Figure
- B – Field Notes and Logs
- C – Laboratory Report
- D – Photograph Log of Field Work

P:\552-Env\05522421 Manatee CO Port Manatee FM\Report

ATTACHMENT A
SAMPLE LOCATION FIGURE



No.	REVISIONS	DATE	BY

Kimley»Horn
© 2017 KIMLEY-HORN AND ASSOCIATES, INC.
655 NORTH FRANKLIN STREET, SUITE 150, TAMPA, FL 33602
PHONE: 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400016
DATE	6/22/2017
SCALE	AS SHOWN
DESIGNED BY	WWW
DRAWN BY	JRT
CHECKED BY	WEW

Manatee County FLORIDA

END OF SERVICE LIFE
PACKAGE A: FM 28A/ FM 8/ PORT MANATEE
MANATEE COUNTY FL

LICENSED PROFESSIONAL

W. WADE WOOD, P.E

FL LICENSE NUMBER
69051

DATE:

PORT MANATEE FORCE MAIN KEY SHEET

SHEET NUMBER
14

ATTACHMENT B
FIELD NOTES AND LOGS

Boldly "X" this box if there is qualified data on this page.

Form FD9000-8 **CALIBRATION LOG (FDEP SOP FT 1000-FT 1500, FD 1000-FD 4000)** *11-10-05*

Project/Site: Port Manatee Date: 10-25-17 Meter # 06K1082 AL

Temperature (Quarterly) *For Date of Last Temperature Verification see* _____ *in log book*

Dissolved Oxygen	**DEP SOP FT 1500**	Initials	Date	Time	Probe Charge	Probe Gain	mg/L	Temp °C	% DO	Saturation mg/L (from chart)	Pass or Fail
										Acceptance Criteria:+/-0.3mg/l	
CAL ICV CCV		AH	10-25-17	1000	-	-	8.71	19.14	94.2	9.25	P F
CAL ICV CCV				1001	-	-	9.41	19.15	101.7	9.25	P F
CAL ICV CCV				1002	-	-	9.41	19.15	101.7	9.25	P F
CAL ICV CCV				18:10	-		5.97	21.89	68.0	8.61	P F
CAL ICV CCV				18:20	-	-	8.85	21.90	100.6	8.76	P F
CAL ICV CCV											P F
CAL ICV CCV											P F

Specific Conductance	**DEP SOP FT 1200**	Initials	Date	Time	Standard µmhos/cm	Exp. Date	Lot #	Bottle #	Cell Constant	Reading µmhos/cm	Pass or Fail
										Acceptance Criteria: +/- 5%	
CAL ICV CCV		AH	10-25-17	1006	1000	04-18	1704140	1	-	1000	P F
CAL ICV CCV				1009	500	04-18	170327C	1	-	492-522	P F
CAL ICV CCV				18:15	1000	04-18	1704140	1	-	917	P F
CAL ICV CCV				18:16	500	04-18	170327C	1	-	477	P F
CAL ICV CCV											P F
CAL ICV CCV											P F
CAL ICV CCV											P F

pH	**DEP SOP FT 1100**	Initials	Date	Time	Standard SU	Exp. Date	Lot #	Bottle #	Slope	Reading SU	Pass or Fail
										Acceptance Criteria: +/- 0.2 SU	
CAL ICV CCV		AH	10-25-17	1012	7	08-18	170213G	1	-	7.13	P F
CAL ICV CCV				1015	4	04-18	1704140A	1	-	4.16	P F
CAL ICV CCV				1018	10	08-18	170213C	1	-	9.94	P F
CAL ICV CCV				18:23	7	08-18	170213G	1	-	6.89	P F
CAL ICV CCV				18:25	4	04-18	1704140A	1	-	4.14	P F
CAL ICV CCV				18:30	10	08-18	170213C	1	-	9.81	P F
CAL ICV CCV											P F
CAL ICV CCV											P F
CAL ICV CCV											P F

Maintenance: Weekly pH Slope: _____ Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen Membrane Changed: Yes No

Notes:

Perform only in Calibrate Mode: **CAL** - Calibrate -
Perform only in Run Mode: **ICV** - Initial Calibration Verification
Perform only in Run Mode: **CCV** - Continuing Calibration Verification

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) 2100P Turbidimeter **INSTRUMENT #** 05030C011697

PARAMETER: *[check only one]* Hach

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.31 NTU Lot A6351
Standard B 58.0 NTU Lot A6256
Standard C 589 NTU Lot A07004
Standard D _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/10/25		A	4.31	4.28		NO	cont	AH
↓		B	58.0	58.3		↓	↓	↓
		C	589	595				
		A	4.31	4.34		NO	cont	AH
		B	58.0	57.1		↓	↓	↓
		C	589	593				

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) Tiger Ion Science **INSTRUMENT #** T-105387

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☒ OTHER PID

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 0 ambient air
Standard B 100 PPM Isobutylene (C_4H_8)
Standard C _____
Standard D _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/10/25	0950	A	0	0		NO	cont	AH
"	0951	B	100	100ppm		NO	cont	AH

BORING LOG

Page 1 of ____

Boring/Well Number: SB-1	Permit Number:		FDEP Facility Identification Number:
Site Name: Port Manatee - FM	Borehole Start Date: 10-25-17 End Date:	Borehole Start Time: ☐ AM ☐ PM End Time: ☐ AM ☐ PM	
Environmental Contractor: PSI	Geologist's Name: Sean Barnes		Environmental Technician's Name: Anthony Hall
Drilling Company: NET	Pavement Thickness (inches): 3-4	Borehole Diameter (inches): 4	Borehole Depth (feet): 10
Drilling Method(s): DP	Apparent Borehole DTW (in feet from soil moisture content): 4'	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type): MiniRAE 3000 ☐ FID ☑ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☑ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☑ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA								Asphalt & Limestone Base)			
						0.0	1	Brown Silty, Fine Sand w/ some small pieces of rock (Fill?)	SM	D	
						0.0	2	Tan Silty Fine Sand (Fill?)			2-4 soil sample
						0.2	3	Gray Silty, Clayey, Fine Sand (Fill?) - more sandy	SC	M	
						0.4	4			W	
						0.2	5				4-6 soil sample
DP						2.2	6	Gray Silty, Clayey Fine Sand - more clayey			
						56.2	7	Dark Brown Silty Fine Sand	SM	S	6-8 soil sample
						98.4	8	petroleum odor @ 8' bls			
						51.7	9	Moist to wet		W	
						240	10	Gray to Brown, Silty, Clayey Fine Sand w/ some pieces of Limestone	SC		
							11				
							12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings

Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

BORING LOG

Page 1 of

Boring/Well Number: SB-2	Permit Number:		FDEP Facility Identification Number:
Site Name: Port Manatee - FM	Borehole Start Date: 10-25-17 End Date:	Borehole Start Time: ☐ AM ☐ PM End Time: ☐ AM ☐ PM	
Environmental Contractor: PSI	Geologist's Name: Sean Barnes	Environmental Technician's Name: Anthony Hall	
Drilling Company: NET	Pavement Thickness (inches): 3-4	Borehole Diameter (inches): 4	Borehole Depth (feet): 10
Drilling Method(s): DP	Apparent Borehole DTW (in feet from soil moisture content):	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type): Mini RAE 3000 ☐ FID ☑ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☑ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☑ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA						0.1	1	Asphalt Tan to Brown Limestone w/some crushed shell	SM	D	
						0.1	2	Tan to Brown Silty Clayey Fine Sand w/pieces of Limestone (Fill)	SC		
						0.1	3			M	4-6 Soil Sample
						0.1	4				
						0.1	5			W	
						0.1	6				6-8 Soil Sample
DP						0.2	7	Gray Silty Clayey (Fill?) Fine Sand w/ some pieces of Limestone			
						47.9	8	Gray to Dark Gray to Dark Brown Silty Fine Sand	SM	S	
						5.5	9	Dark Brown Silty Fine Sand (Bay Bottom)		W	
						2.9	10				
							11				
							12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Soil Core; DC = Drill Cuttings

Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

BORING LOG

Page 1 of

Boring/Well Number: SB-3	Permit Number:		FDEP Facility Identification Number:
Site Name: Port Manatee - FM	Borehole Start Date: 10-25-19 End Date:	Borehole Start Time: ☐ AM ☐ PM End Time: ☐ AM ☐ PM	
Environmental Contractor: PSI	Geologist's Name: Sean Barnes	Environmental Technician's Name: Anthony Hall	
Drilling Company: NET	Pavement Thickness (inches): 3-4	Borehole Diameter (inches): 4	Borehole Depth (feet): 12
Drilling Method(s): DP	Apparent Borehole DTW (in feet from soil moisture content):	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type): Mini RAE 3000 ☐ FID ☑ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☑ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☑ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA						0.1	1	Asphalt Tan Limestone Base (Fill)		D	
						0.1	2				2-4 Soil Sample
						0.1	3				
						0.1	4			M	
						0.1	5	Brown Silty fine Sand (Fill?)	SM		
DP						0.1	6	Gray Silty fine Sand			6-8 Soil Sample
						0.2	7	Gray Silty, Sandy, Clay	SC	W	
						158	8	Gray to Dk Gray to Brown Silty fine Sand	SM	S	H_2S odor, no petro odor observed
						7.2	9	Dark Brown Silty fine Sand (Muck - Bay Bottom)	OL	W	
						2.8	10				
						1.4	11				
						0.8	12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings

Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

BORING LOG

Page 1 of _____

Boring/Well Number: SB-4	Permit Number:		FDEP Facility Identification Number:
Site Name: Port Manatee - FM	Borehole Start Date: 10-25-17 End Date:	Borehole Start Time: ☐ AM ☐ PM End Time: ☐ AM ☐ PM	
Environmental Contractor: PSI	Geologist's Name: Sean Barnes		Environmental Technician's Name: Anthony Hall
Drilling Company: NET	Pavement Thickness (inches): 3-4	Borehole Diameter (inches): 4	Borehole Depth (feet): 10
Drilling Method(s): DP	Apparent Borehole DTW (in feet from soil moisture content):	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type): Mini Rae 3000 ☐ FID ☑ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☑ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☑ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA								Asphalt			
						0.4	1	Gray Crushed Rock (Concrete) Silty Fine Sand (Fill)	SM	D	
						0.7	2				2-4 Soil Sample
						0.3	3	Gray Silty, Sandy, Clay w/ pieces of limestone	SL	M	
						0.2	4	Gray to Brown Silty, Sandy Clay w/ pieces of limestone			
						0.2	5	Dark Gray to Black, Silty clayey, Fine Sand			
						0.2	6	Gray Silty, Clayey, Fine Sand		W	6-8 Soil Sample
DP						1.2	7	Gray Silty Clay (Loose)			
						7.8	8	Dark Gray Silty Fine Sand (old beach)	SM	S	H_2S odor
						8.6	9	Dark Brown Silty Fine Sand	PT	W	
						13.8	10	" " " w/ organic material - Peaty			
						0.3	11	Gray to Brown Clay (loose / soft)	SC		
						0.3	12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Soil Core; DC = Drill Cuttings

Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

BORING LOG

Page 1 of ____

Boring/Well Number: SB-5	Permit Number:		FDEP Facility Identification Number:
Site Name: Port Manatee - FM	Borehole Start Date: 10-25-19 End Date:	Borehole Start Time: ☐ AM ☐ PM End Time: ☐ AM ☐ PM	
Environmental Contractor: PSI	Geologist's Name: Sean Barnes	Environmental Technician's Name: Anthony Hall	
Drilling Company: NET	Pavement Thickness (inches): 3-4	Borehole Diameter (inches): 4	Borehole Depth (feet): 10
Drilling Method(s): DP	Apparent Borehole DTW (in feet from soil moisture content):	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type): Mini RAE 3000 ☐ FID ☑ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☑ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☑ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA						0.8	1	Asphalt Gray Silty Fine Sand (Fill)	SM	D	0-2 Soil
						1.3	2	some pieces of rock			
						1.1	3			M	
						1.0	4				
						0.3	5			W	
						0.2	6				
DP						0.2	7	little clayey	SC		6-8 Soil
						1.8	8	clayey Brown Silty Fine Sand (organic)	OL	S	H_2S odor
						30.2	9	Gray to Dark Gray Silty Fine Sand	SM	W	
						18.2	10				
						32.4	11				
						24.1	12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Soil Core; DC = Drill Cuttings

Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Port Manatee - AM	SITE LOCATION: ~~Bradenton~~ Palmetto, FL	
WELL NO: SB-1	SAMPLE ID:	DATE: 10-25-17

PURGING DATA

WELL DIAMETER (inches): 1"	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to 4 feet 8	STATIC DEPTH TO WATER (feet): -	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 6	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 6	PURGING INITIATED AT: 1054	PURGING ENDED AT: 11:30	TOTAL VOLUME PURGED (gallons): 2.52

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1124	2.10	2.10	0.07	-	6.99	30.15	3055	0.55/7.4	8.79	clear	-356.6
1127	0.21	2.31	↓	-	7.00	30.13	3045	0.75/10.0	6.29	↓	-350.9
1130	0.21	2.52	↓	-	7.01	30.07	3043	0.73/9.8	5.33	↓	-348.8

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Anthony Hall PSI	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1132	SAMPLING ENDED AT: 11:45
PUMP OR TUBING DEPTH IN WELL (feet): 6	TUBING MATERIAL CODE: HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	1	AG	1L	-	-	-	8270D PAH SIM 8270D 8082A	APP	250
	2	AG	250ml	H2SO4	-	-	FloPro	↓	↓
	1	AG	250ml	-	-	-	8081B		
	1	AG	250ml	-	-	-	8270D PAH SIM 8082A		
	2	PE	250ml	HNO3	-	-	TO, BA, NS, AG SE, PB, Hg, CR		
	3	CG	40ml	HCl	-	-	8260B Aroma		

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	Port Manatee - FM	SITE LOCATION:	Palmetto, FL
WELL NO:	SB-2	SAMPLE ID:	DATE: 10-25-17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
1"	1/4	5 feet 9	-	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
7	7	1200	1245	3.15

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1230	2.10	2.10	0.07	-	7.32	30.94	1242	2.27/29.8	24.7	clear	-298.8
1233	0.21	2.31	↓	-	7.22	30.78	1444	0.88/11.8	28.4	↓	-346.6
1236	0.21	2.52		-	7.16	30.87	1427	0.83/11.1	25.0		-350.1
1239	0.21	2.73		-	7.08	30.70	1428	0.60/8.0	19.3		-356.7
1242	0.21	2.94		-	7.05	30.77	1420	0.50/6.8	18.2		-357.7
1245	0.21	3.15	↓	-	7.03	30.76	1419	0.47/6.3	16.3	↓	-357.2

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Anthony Hall PSI		1248	13:09

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE:	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
7	HDPE		

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	1	AG	1L				8270 8082	APP	250
	2	↓	250ml	H_2SO_4			FL PRO	↓	↓
	1		↓				8081		
	1						8270/8082		
	2	PE	↓	HNO_3			RCRA-8		
	3	CG	40ml	HCl			8260		

REMARKS:
bubbles in 2 of the 40 ml vials could not get them out

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	Port Manatee - FM	SITE LOCATION:	Palmetto, FL
WELL NO:	SB-3	SAMPLE ID:	DATE: 10-25-17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
1"	1/4	7 feet 11	-	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
9	9	1507	1543	2.52

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1537	2.10	2.10	0.07	-	7.03	30.23	4983	0.77/10.4	9.85	clear	-359.3
1540	0.21	2.31	↓	-	7.03	30.09	4978	0.76/10.2	7.40	↓	-359.4
1543	0.21	2.52	↓	-	7.03	30.14	4975	0.74/9.9	7.54	↓	-359.2

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Anthony Hall PSI		1546	1600

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE:	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
9	HDPE		

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	1	AG	1L				8270/8082	APP	250
	2	↓	250 ml	H_2SO_4			FL PRO	↓	↓
	1	↓	↓				8081		
	1	↓	↓				8270/8082		
	2	PE	↓	HNO_3			RCRA 8		
	3	CG	40ml	HCl			8260		

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	Port Manatee - FM	SITE LOCATION:	Palmetto, FL
WELL NO:	SB-4	SAMPLE ID:	DATE: 10-25-17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
1"	1/4	7.5 feet 11.5	-	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
9.5	9.5	1622	1713	3.57

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1652	2.10	2.10	0.07	-	7.81	30.00	6620	0.82/11.3	140	brown	-332.5
1655	0.21	2.31	↓	-	7.60	30.14	6047	1.71/23.2	41.0	↓	-342.1
1658	0.21	2.52	↓	-	7.40	30.13	3375	1.85/26.2	40.2	↓	-343.9
1701	0.21	2.73	↓	-	7.37	30.21	1604	2.47/33.2	28.8	↓	-341.5
1704	0.21	2.94	↓	-	7.31	30.05	6502	2.89/38.6	20.0	↓	-339.1
1707	0.21	3.15	↓	-	7.28	30.08	6488	1.16/15.3	19.8	↓	-341.3
1710	0.21	3.36	↓	-	7.28	29.97	6507	1.05/14.1	16.2	↓	-342.2
1713	0.21	3.57	↓	-	7.25	30.06	6478	1.03/13.9	15.3	↓	-342.5

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1715	SAMPLING ENDED AT:
Anthony Hall		1700	17:28

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE:	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
9.5	HDPE		

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	1	AG	1L				8270/8082	APP	250 mL
	2	↓	250mL	H_2SO_4			PCPRO	↓	↓
	1	↓	↓				8081		
	1	↓	↓				8270/8082		
	2	PE	↓	HNO_3			RCRA8	↓	↓
	3	CG	40 mL	HCl			8260		

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	Port Manatee - FM	SITE LOCATION:	Palmetto, FL
WELL NO:	SB-5	SAMPLE ID:	DATE: 10-25-17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to	feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
1"	1/4	7.5	11.5	-	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
9.5	9.5	1742	17:51	2.52

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1745	2.16	2.10	0.07	-	6.80	27.96	1368	1.36/12.6	42.6	Brown	-268.8
1748	0.21	2.31	↓	-	6.96	27.89	1353	1.35/12.5	40.4	↓	-282.9
1751	0.21	2.52	↓	-		27.92	1374	1.37/12.7	44.1	↓	-280.8

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Anthony Reed PSI		1753	18:07

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE:	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
9.5	HDPE		

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	1	AG	1L				8270/8082	APP	250 ml
	2	↓	250ml	H_2SO_4			FL PRO	↓	↓
	1		↓				8081		
	1						8270/8082		
	2	PE	↓	HNO_3			RCRA 8		
	3	CG	40 ml	HCl			8260		

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

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Revision Date: February 12, 2009

NORTH DOCK STREET

PROPOSED POINT OF CONNECTION TO EXISTING MAIN

ARV ASSEMBLY

4" PVC FM

4" HDPE FM

20

19

18

17

16

15

EASTERN AVENUE

4" PLUG VALVE

SOUTH TERMINAL STREET

PROPOSED POINT OF CONNECTION TO EXISTING FORCE MAIN

PORT MANATEE 2 LIFT STATION

REGAL CRUISE WAY

DEL MONTE WAY

SOUTH DOCK STREET

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

LEGEND
OPEN CUT
HDD

SB-1 Soil Boring Location

SB-1 @ 18' Deep

SB-2

SB-3

SB-4

SB-5

8" Jacked 30"

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2017 KIMLEY-HORN AND ASSOCIATES, INC.
655 NORTH FRANKLIN STREET, SUITE 150, TAMPA, FL 33602
PHONE 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400016
DATE 6/22/2017
SCALE AS SHOWN
DESIGNED BY WWW
DRAWN BY JRT
CHECKED BY WEW

Manatee County FLORIDA

END OF SERVICE LIFE
PACKAGE A: FM 28A/ FM 8/ PORT MANATEE
MANATEE COUNTY FL

LICENSED PROFESSIONAL
W WADE WOOD, P.E.
FL LICENSE NUMBER 69051
DATE

PORT MANATEE FORCE MAIN KEY SHEET

SHEET NUMBER
14

ATTACHMENT C
LABORATORY REPORT

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Monday, November 6, 2017
PSI - Tampa (PS003)
Attn: Sean Barnes
5801 Benjamin Center Drive Suite 112
Tampa, FL 33634

RE: Laboratory Results for
Project Number: 05522421, Project Name/Desc: Manatee County - Port Manatee
ENCO Workorder(s): AA07481

Dear Sean Barnes,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, October 27, 2017.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

David Camacho For Cassie B. Puryear

Project Manager

Enclosure(s)

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: SB-1 **Lab ID: AA07481-01** **Sampled: 10/25/17 11:32** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/23/18		10/30/17	09:04	10/31/17 10:51
EPA 7470A	EPA 7470A	11/22/17		10/30/17	13:36	10/31/17 09:13
EPA 8081B	EPA 3510C	11/01/17	12/09/17	10/30/17	14:00	10/31/17 10:04
EPA 8082A	EPA 3510C	10/25/18	10/25/18	11/01/17	13:43	11/01/17 18:39
EPA 8260B	EPA 5030B_MS	11/08/17		11/01/17	13:59	11/02/17 01:59
EPA 8270D	EPA 3510C_MS	11/01/17	12/06/17	10/27/17	10:56	10/29/17 15:53
EPA 8270D	EPA 3511_MS	11/01/17	12/09/17	10/30/17	13:36	11/01/17 19:33
FL-PRO	EPA 3510C	11/01/17	12/09/17	10/30/17	17:19	11/01/17 06:39

Client ID: SB-2 **Lab ID: AA07481-02** **Sampled: 10/25/17 12:48** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/23/18		10/30/17	09:04	10/31/17 10:56
EPA 7470A	EPA 7470A	11/22/17		10/30/17	13:36	10/31/17 09:31
EPA 8081B	EPA 3510C	11/01/17	12/09/17	10/30/17	14:00	10/31/17 10:16
EPA 8082A	EPA 3510C	10/25/18	10/25/18	11/01/17	13:43	11/01/17 18:51
EPA 8260B	EPA 5030B_MS	11/08/17		11/01/17	13:59	11/02/17 02:28
EPA 8270D	EPA 3510C_MS	11/01/17	12/06/17	10/27/17	10:56	10/29/17 16:23
EPA 8270D	EPA 3511_MS	11/01/17	12/09/17	10/30/17	13:36	11/01/17 19:54
FL-PRO	EPA 3510C	11/01/17	12/09/17	10/30/17	17:19	11/01/17 07:13

Client ID: SB-3 **Lab ID: AA07481-03** **Sampled: 10/25/17 15:46** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/23/18		10/30/17	09:04	10/31/17 10:57
EPA 7470A	EPA 7470A	11/22/17		10/30/17	13:36	10/31/17 09:40
EPA 8082A	EPA 3510C	10/25/18	10/25/18	11/01/17	13:43	11/01/17 19:02
EPA 8260B	EPA 5030B_MS	11/08/17		11/01/17	13:59	11/02/17 02:57
EPA 8270D	EPA 3510C_MS	11/01/17	12/06/17	10/27/17	10:56	10/29/17 16:54
EPA 8270D	EPA 3511_MS	11/01/17	12/09/17	10/30/17	13:36	11/01/17 20:16
FL-PRO	EPA 3510C	11/01/17	12/09/17	10/30/17	17:19	11/01/17 07:47

Client ID: SB-3 **Lab ID: AA07481-03RE1** **Sampled: 10/25/17 15:46** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8081B	EPA 3510C	11/01/17	12/09/17	10/30/17	14:00	10/31/17 12:08

Client ID: SB-4 **Lab ID: AA07481-04** **Sampled: 10/25/17 17:15** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/23/18		10/30/17	09:04	10/31/17 10:59
EPA 7470A	EPA 7470A	11/22/17		10/30/17	13:36	10/31/17 09:43
EPA 8081B	EPA 3510C	11/01/17	12/09/17	10/30/17	14:00	10/31/17 10:41
EPA 8082A	EPA 3510C	10/25/18	10/25/18	11/01/17	13:43	11/01/17 19:26
EPA 8260B	EPA 5030B_MS	11/08/17		11/01/17	13:59	11/02/17 03:25
EPA 8270D	EPA 3510C_MS	11/01/17	12/06/17	10/27/17	10:56	10/29/17 17:24
EPA 8270D	EPA 3511_MS	11/01/17	12/09/17	10/30/17	13:36	11/01/17 20:38
FL-PRO	EPA 3510C	11/01/17	12/09/17	10/30/17	17:19	11/01/17 08:20

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: SB-5 | **Lab ID: AA07481-05** | **Sampled: 10/25/17 17:53** | **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/23/18		10/30/17	09:04	10/31/17 11:01
EPA 7470A	EPA 7470A	11/22/17		10/30/17	13:36	10/31/17 09:46
EPA 8081B	EPA 3510C	11/01/17	12/09/17	10/30/17	14:00	10/31/17 10:53
EPA 8082A	EPA 3510C	10/25/18	10/25/18	11/01/17	13:43	11/01/17 19:38
EPA 8260B	EPA 5030B_MS	11/08/17		11/01/17	13:59	11/02/17 03:54
EPA 8270D	EPA 3510C_MS	11/01/17	12/06/17	10/27/17	10:56	10/29/17 17:55
EPA 8270D	EPA 3511_MS	11/01/17	12/09/17	10/30/17	13:36	11/01/17 21:00
FL-PRO	EPA 3510C	11/01/17	12/09/17	10/30/17	17:19	11/01/17 08:54

Client ID: TRIP BLANK | **Lab ID: AA07481-06** | **Sampled: 10/25/17 00:00** | **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8260B	EPA 5030B_MS	11/08/17	10/31/17	00:00	10/31/17 16:46

Client ID: TRIP BLANK | **Lab ID: AA07481-07** | **Sampled: 10/25/17 00:00** | **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8260B	EPA 5030B_MS	11/08/17	10/31/17	00:00	10/31/17 17:15

SAMPLE DETECTION SUMMARY

Client ID: SB-1 **Lab ID: AA07481-01**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1-Methylnaphthalene	3.0		0.47	1.0	ug/L	EPA 8270D	
2-Methylnaphthalene	2.3		0.44	1.0	ug/L	EPA 8270D	
Arsenic - Total	17.9		8.00	10.0	ug/L	EPA 6010C	
Barium - Total	19.0		2.00	10.0	ug/L	EPA 6010C	
Benzene	17		0.71	1.0	ug/L	EPA 8260B	
Ethylbenzene	43		0.69	1.0	ug/L	EPA 8260B	
Lead - Total	3.90	I	3.80	10.0	ug/L	EPA 6010C	
m,p-Xylenes	14		1.3	2.0	ug/L	EPA 8260B	
Naphthalene	130		0.35	1.0	ug/L	EPA 8270D	
o-Xylene	1.3		0.53	1.0	ug/L	EPA 8260B	
Silver - Total	0.829	I	0.740	10.0	ug/L	EPA 6010C	
Toluene	1.3		0.72	1.0	ug/L	EPA 8260B	
TPH (C8-C40)	510	I	100	680	ug/L	FL-PRO	
Xylenes (Total)	15		1.3	2.0	ug/L	EPA 8260B	

Client ID: SB-2 **Lab ID: AA07481-02**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1-Methylnaphthalene	12		0.047	0.10	ug/L	EPA 8270D	
2-Methylnaphthalene	0.046	I	0.044	0.10	ug/L	EPA 8270D	
Acenaphthene	0.30		0.037	0.10	ug/L	EPA 8270D	
Anthracene	0.057	I	0.036	0.10	ug/L	EPA 8270D	
Arsenic - Total	13.5		8.00	10.0	ug/L	EPA 6010C	
Barium - Total	8.42	I	2.00	10.0	ug/L	EPA 6010C	
Naphthalene	1.5		0.035	0.10	ug/L	EPA 8270D	

Client ID: SB-3 **Lab ID: AA07481-03**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acenaphthene	0.25		0.037	0.10	ug/L	EPA 8270D	
Arsenic - Total	24.2		8.00	10.0	ug/L	EPA 6010C	
Barium - Total	63.3		2.00	10.0	ug/L	EPA 6010C	
Lead - Total	6.66	I	3.80	10.0	ug/L	EPA 6010C	
Silver - Total	0.821	I	0.740	10.0	ug/L	EPA 6010C	

Client ID: SB-4 **Lab ID: AA07481-04**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	26.8		8.00	10.0	ug/L	EPA 6010C	
Barium - Total	36.0		2.00	10.0	ug/L	EPA 6010C	
Cadmium - Total	0.567	I	0.450	1.00	ug/L	EPA 6010C	
Chromium - Total	2.12	I	1.10	10.0	ug/L	EPA 6010C	
Lead - Total	9.07	I	3.80	10.0	ug/L	EPA 6010C	

Client ID: SB-5 **Lab ID: AA07481-05**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	17.1		8.00	10.0	ug/L	EPA 6010C	
Barium - Total	6.96	I	2.00	10.0	ug/L	EPA 6010C	
Chromium - Total	4.44	I	1.10	10.0	ug/L	EPA 6010C	
Lead - Total	4.58	I	3.80	10.0	ug/L	EPA 6010C	
Silver - Total	0.834	I	0.740	10.0	ug/L	EPA 6010C	

ANALYTICAL RESULTS

Description: SB-1 **Lab Sample ID:** AA07481-01 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 11:32 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	**17**		ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 01:59	KKW	
Ethylbenzene [100-41-4]^	**43**		ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 01:59	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	**14**		ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 01:59	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 01:59	KKW	
o-Xylene [95-47-6]^	**1.3**		ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 01:59	KKW	
Toluene [108-88-3]^	**1.3**		ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 01:59	KKW	
Xylenes (Total) [1330-20-7]^	**15**		ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 01:59	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*50*	*1*	*50.0*	*100 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 01:59*	*KKW*	
Dibromofluoromethane	*51*	*1*	*50.0*	*101 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 01:59*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*105 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 01:59*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
1,2-Dichlorobenzene [95-50-1]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
1,3-Dichlorobenzene [541-73-1]^	3.4	U	ug/L	1	3.4	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
1,4-Dichlorobenzene [106-46-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2,4,5-Trichlorophenol [95-95-4]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2-Methylphenol [95-48-7]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2-Nitroaniline [88-74-4]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
3-Nitroaniline [99-09-2]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
4-Chloroaniline [106-47-8]^	4.3	U	ug/L	1	4.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
4-Nitroaniline [100-01-6]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Benzoic acid [65-85-0]^	15	U	ug/L	1	15	50	7J27017	EPA 8270D	10/29/17 15:53	jfi	J-06
Benzyl alcohol [100-51-6]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	

ANALYTICAL RESULTS

Description: SB-1 **Lab Sample ID:** AA07481-01 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 11:32 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Dibenzofuran [132-64-9]^	2.8	U	ug/L	1	2.8	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	
Pyridine [110-86-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 15:53	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*40*	*1*	*50.0*	*81 %*	*33-145*	*7J27017*	*EPA 8270D*	*10/29/17 15:53*	*jfi*	
2-Fluorobiphenyl	*32*	*1*	*50.0*	*63 %*	*32-116*	*7J27017*	*EPA 8270D*	*10/29/17 15:53*	*jfi*	
2-Fluorophenol	*12*	*1*	*50.0*	*25 %*	*11-100*	*7J27017*	*EPA 8270D*	*10/29/17 15:53*	*jfi*	
Nitrobenzene-d5	*25*	*1*	*50.0*	*49 %*	*24-107*	*7J27017*	*EPA 8270D*	*10/29/17 15:53*	*jfi*	
Phenol-d5	*8.8*	*1*	*50.0*	*18 %*	*10-100*	*7J27017*	*EPA 8270D*	*10/29/17 15:53*	*jfi*	
Terphenyl-d14	*39*	*1*	*50.0*	*78 %*	*52-150*	*7J27017*	*EPA 8270D*	*10/29/17 15:53*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	**3.0**		ug/L	10	0.47	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
2-Methylnaphthalene [91-57-6]^	**2.3**		ug/L	10	0.44	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Acenaphthene [83-32-9]^	0.37	U	ug/L	10	0.37	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Acenaphthylene [208-96-8]^	0.36	U	ug/L	10	0.36	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Anthracene [120-12-7]^	0.36	U	ug/L	10	0.36	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Benzo(a)anthracene [56-55-3]^	0.37	U	ug/L	10	0.37	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Benzo(a)pyrene [50-32-8]^	0.43	U	ug/L	10	0.43	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.59	U	ug/L	10	0.59	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.40	U	ug/L	10	0.40	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.46	U	ug/L	10	0.46	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Chrysene [218-01-9]^	0.51	U	ug/L	10	0.51	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.26	U	ug/L	10	0.26	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Fluoranthene [206-44-0]^	0.51	U	ug/L	10	0.51	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Fluorene [86-73-7]^	0.38	U	ug/L	10	0.38	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.37	U	ug/L	10	0.37	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Naphthalene [91-20-3]^	**130**		ug/L	10	0.35	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	

ANALYTICAL RESULTS

Description: SB-1 **Lab Sample ID:** AA07481-01 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 11:32 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.39	U	ug/L	10	0.39	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	
Pyrene [129-00-0]^	0.48	U	ug/L	10	0.48	1.0	7J30041	EPA 8270D	11/01/17 19:33	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*4.7*	*10*	*5.71*	*83 %*	*61-151*	*7J30041*	*EPA 8270D*	*11/01/17 19:33*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
4,4'-DDE [72-55-9]^	0.036	U	ug/L	1	0.036	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
4,4'-DDT [50-29-3]^	0.025	U	ug/L	1	0.025	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.032	U	ug/L	1	0.032	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
alpha-BHC [319-84-6]^	0.026	U	ug/L	1	0.026	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
beta-BHC [319-85-7]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Chlordane (tech) [12789-03-6]^	0.36	U	ug/L	1	0.36	0.50	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Chlordane-alpha [5103-71-9]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Chlordane-gamma [5566-34-7]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
delta-BHC [319-86-8]^	0.019	U	ug/L	1	0.019	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Dieldrin [60-57-1]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Endosulfan I [959-98-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Endosulfan II [33213-65-9]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QV-01
Endrin [72-20-8]^	0.014	U	ug/L	1	0.014	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QV-01
Endrin aldehyde [7421-93-4]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Endrin ketone [53494-70-5]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QV-01
gamma-BHC [58-89-9]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QV-01
Heptachlor [76-44-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Isodrin [465-73-6]^	0.030	U	ug/L	1	0.030	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	
Methoxychlor [72-43-5]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QL-02, QV-01
Mirex [2385-85-5]^	0.034	U	ug/L	1	0.034	0.050	7J30039	EPA 8081B	10/31/17 10:04	JJB	QV-01
Toxaphene [8001-35-2]^	0.48	U	ug/L	1	0.48	0.50	7J30039	EPA 8081B	10/31/17 10:04	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.82*	*1*	*1.02*	*80 %*	*38-142*	*7J30039*	*EPA 8081B*	*10/31/17 10:04*	*JJB*	
Decachlorobiphenyl	*0.56*	*1*	*1.02*	*55 %*	*34-159*	*7J30039*	*EPA 8081B*	*10/31/17 10:04*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 18:39	JJB	
PCB-1221 [11104-28-2]^	0.46	U	ug/L	1	0.46	0.50	7K01019	EPA 8082A	11/01/17 18:39	JJB	
PCB-1232 [11141-16-5]^	0.47	U	ug/L	1	0.47	0.50	7K01019	EPA 8082A	11/01/17 18:39	JJB	
PCB-1248 [12672-29-6]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 18:39	JJB	
PCB-1254 [11097-69-1]^	0.50	U	ug/L	1	0.50	0.50	7K01019	EPA 8082A	11/01/17 18:39	JJB	
PCB-1260 [11096-82-5]^	0.48	U	ug/L	1	0.48	0.50	7K01019	EPA 8082A	11/01/17 18:39	JJB	

ANALYTICAL RESULTS

Description: SB-1 **Lab Sample ID:** AA07481-01 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 11:32 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
2,4,5,6-TCMX	*0.45*	*1*	*1.00*	*45 %*	*38-142*	*7K01019*	*EPA 8082A*	*11/01/17 18:39*	*JJB*	
Decachlorobiphenyl	*0.82*	*1*	*1.00*	*82 %*	*34-159*	*7K01019*	*EPA 8082A*	*11/01/17 18:39*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	**510**	I	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 06:39	JJB	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
n-Nonatriacontane	*340*	*1*	*400*	*86 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 06:39*	*JJB*	
o-Terphenyl	*210*	*1*	*201*	*104 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 06:39*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.0230	U	ug/L	1	0.0230	0.200	7J30018	EPA 7470A	10/31/17 09:13	EIC	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**17.9**		ug/L	1	8.00	10.0	7J30001	EPA 6010C	10/31/17 10:51	ACV	
Barium [7440-39-3]^	**19.0**		ug/L	1	2.00	10.0	7J30001	EPA 6010C	10/31/17 10:51	ACV	
Cadmium [7440-43-9]^	0.450	U	ug/L	1	0.450	1.00	7J30001	EPA 6010C	10/31/17 10:51	ACV	
Chromium [7440-47-3]^	1.10	U	ug/L	1	1.10	10.0	7J30001	EPA 6010C	10/31/17 10:51	ACV	
Lead [7439-92-1]^	**3.90**	I	ug/L	1	3.80	10.0	7J30001	EPA 6010C	10/31/17 10:51	ACV	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	40.0	7J30001	EPA 6010C	10/31/17 10:51	ACV	
Silver [7440-22-4]^	**0.829**	I	ug/L	1	0.740	10.0	7J30001	EPA 6010C	10/31/17 10:51	ACV	

ANALYTICAL RESULTS

Description: SB-2 **Lab Sample ID:** AA07481-02 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 12:48 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 02:28	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 02:28	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 02:28	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 02:28	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 02:28	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 02:28	KKW	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 02:28	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*102 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 02:28*	*KKW*	
Dibromofluoromethane	*50*	*1*	*50.0*	*101 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 02:28*	*KKW*	
Toluene-d8	*53*	*1*	*50.0*	*106 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 02:28*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
1,2-Dichlorobenzene [95-50-1]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
1,3-Dichlorobenzene [541-73-1]^	3.4	U	ug/L	1	3.4	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
1,4-Dichlorobenzene [106-46-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2,4,5-Trichlorophenol [95-95-4]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2-Methylphenol [95-48-7]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2-Nitroaniline [88-74-4]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
3-Nitroaniline [99-09-2]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
4-Chloroaniline [106-47-8]^	4.3	U	ug/L	1	4.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
4-Nitroaniline [100-01-6]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Benzoic acid [65-85-0]^	15	U	ug/L	1	15	50	7J27017	EPA 8270D	10/29/17 16:23	jfi	J-06
Benzyl alcohol [100-51-6]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	

ANALYTICAL RESULTS

Description: SB-2 **Lab Sample ID:** AA07481-02 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 12:48 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Dibenzofuran [132-64-9]^	2.8	U	ug/L	1	2.8	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	
Pyridine [110-86-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 16:23	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*40*	*1*	*50.5*	*79 %*	*33-145*	*7J27017*	*EPA 8270D*	*10/29/17 16:23*	*jfi*	
2-Fluorobiphenyl	*34*	*1*	*50.5*	*68 %*	*32-116*	*7J27017*	*EPA 8270D*	*10/29/17 16:23*	*jfi*	
2-Fluorophenol	*12*	*1*	*50.5*	*25 %*	*11-100*	*7J27017*	*EPA 8270D*	*10/29/17 16:23*	*jfi*	
Nitrobenzene-d5	*25*	*1*	*50.5*	*49 %*	*24-107*	*7J27017*	*EPA 8270D*	*10/29/17 16:23*	*jfi*	
Phenol-d5	*9.2*	*1*	*50.5*	*18 %*	*10-100*	*7J27017*	*EPA 8270D*	*10/29/17 16:23*	*jfi*	
Terphenyl-d14	*39*	*1*	*50.5*	*78 %*	*52-150*	*7J27017*	*EPA 8270D*	*10/29/17 16:23*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	**12**		ug/L	1	0.047	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
2-Methylnaphthalene [91-57-6]^	**0.046**	I	ug/L	1	0.044	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Acenaphthene [83-32-9]^	**0.30**		ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Acenaphthylene [208-96-8]^	0.036	U	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Anthracene [120-12-7]^	**0.057**	I	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Benzo(a)anthracene [56-55-3]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Benzo(a)pyrene [50-32-8]^	0.043	U	ug/L	1	0.043	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.059	U	ug/L	1	0.059	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.040	U	ug/L	1	0.040	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.046	U	ug/L	1	0.046	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Chrysene [218-01-9]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.026	U	ug/L	1	0.026	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Fluoranthene [206-44-0]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Fluorene [86-73-7]^	0.038	U	ug/L	1	0.038	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Naphthalene [91-20-3]^	**1.5**		ug/L	1	0.035	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	

ANALYTICAL RESULTS

Description: SB-2 **Lab Sample ID:** AA07481-02 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 12:48 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.039	U	ug/L	1	0.039	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	
Pyrene [129-00-0]^	0.048	U	ug/L	1	0.048	0.10	7J30041	EPA 8270D	11/01/17 19:54	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*4.6*	*1*	*5.71*	*80 %*	*61-151*	*7J30041*	*EPA 8270D*	*11/01/17 19:54*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
4,4'-DDE [72-55-9]^	0.036	U	ug/L	1	0.036	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
4,4'-DDT [50-29-3]^	0.025	U	ug/L	1	0.025	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.032	U	ug/L	1	0.032	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
alpha-BHC [319-84-6]^	0.026	U	ug/L	1	0.026	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
beta-BHC [319-85-7]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Chlordane (tech) [12789-03-6]^	0.36	U	ug/L	1	0.36	0.50	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Chlordane-alpha [5103-71-9]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Chlordane-gamma [5566-34-7]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
delta-BHC [319-86-8]^	0.019	U	ug/L	1	0.019	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Dieldrin [60-57-1]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Endosulfan I [959-98-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Endosulfan II [33213-65-9]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01
Endrin [72-20-8]^	0.014	U	ug/L	1	0.014	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01
Endrin aldehyde [7421-93-4]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Endrin ketone [53494-70-5]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01
gamma-BHC [58-89-9]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01
Heptachlor [76-44-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Isodrin [465-73-6]^	0.030	U	ug/L	1	0.030	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	
Methoxychlor [72-43-5]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01, QL-02
Mirex [2385-85-5]^	0.034	U	ug/L	1	0.034	0.050	7J30039	EPA 8081B	10/31/17 10:16	JJB	QV-01
Toxaphene [8001-35-2]^	0.48	U	ug/L	1	0.48	0.50	7J30039	EPA 8081B	10/31/17 10:16	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.41*	*1*	*1.00*	*41 %*	*38-142*	*7J30039*	*EPA 8081B*	*10/31/17 10:16*	*JJB*	
Decachlorobiphenyl	*0.56*	*1*	*1.00*	*56 %*	*34-159*	*7J30039*	*EPA 8081B*	*10/31/17 10:16*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 18:51	JJB	
PCB-1221 [11104-28-2]^	0.46	U	ug/L	1	0.46	0.50	7K01019	EPA 8082A	11/01/17 18:51	JJB	
PCB-1232 [11141-16-5]^	0.47	U	ug/L	1	0.47	0.50	7K01019	EPA 8082A	11/01/17 18:51	JJB	
PCB-1248 [12672-29-6]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 18:51	JJB	
PCB-1254 [11097-69-1]^	0.50	U	ug/L	1	0.50	0.50	7K01019	EPA 8082A	11/01/17 18:51	JJB	
PCB-1260 [11096-82-5]^	0.48	U	ug/L	1	0.48	0.50	7K01019	EPA 8082A	11/01/17 18:51	JJB	

ANALYTICAL RESULTS

Description: SB-2 **Lab Sample ID:** AA07481-02 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 12:48 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.44*	*1*	*1.01*	*44 %*	*38-142*	*7K01019*	*EPA 8082A*	*11/01/17 18:51*	*JJB*	
Decachlorobiphenyl	*0.72*	*1*	*1.01*	*71 %*	*34-159*	*7K01019*	*EPA 8082A*	*11/01/17 18:51*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	100	U	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 07:13	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*410*	*1*	*400*	*103 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 07:13*	*JJB*	
o-Terphenyl	*240*	*1*	*201*	*118 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 07:13*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.0230	U	ug/L	1	0.0230	0.200	7J30018	EPA 7470A	10/31/17 09:31	EIC	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**13.5**		ug/L	1	8.00	10.0	7J30001	EPA 6010C	10/31/17 10:56	ACV	
Barium [7440-39-3]^	**8.42**	I	ug/L	1	2.00	10.0	7J30001	EPA 6010C	10/31/17 10:56	ACV	
Cadmium [7440-43-9]^	0.450	U	ug/L	1	0.450	1.00	7J30001	EPA 6010C	10/31/17 10:56	ACV	
Chromium [7440-47-3]^	1.10	U	ug/L	1	1.10	10.0	7J30001	EPA 6010C	10/31/17 10:56	ACV	
Lead [7439-92-1]^	3.80	U	ug/L	1	3.80	10.0	7J30001	EPA 6010C	10/31/17 10:56	ACV	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	40.0	7J30001	EPA 6010C	10/31/17 10:56	ACV	
Silver [7440-22-4]^	0.740	U	ug/L	1	0.740	10.0	7J30001	EPA 6010C	10/31/17 10:56	ACV	

ANALYTICAL RESULTS

Description: SB-3 **Lab Sample ID:** AA07481-03 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 15:46 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 02:57	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 02:57	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 02:57	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 02:57	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 02:57	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 02:57	KKW	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 02:57	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*50*	*1*	*50.0*	*100 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 02:57*	*KKW*	
Dibromofluoromethane	*50*	*1*	*50.0*	*99 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 02:57*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*105 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 02:57*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
1,2-Dichlorobenzene [95-50-1]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
1,3-Dichlorobenzene [541-73-1]^	3.4	U	ug/L	1	3.4	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
1,4-Dichlorobenzene [106-46-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2,4,5-Trichlorophenol [95-95-4]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2-Methylphenol [95-48-7]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2-Nitroaniline [88-74-4]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
3-Nitroaniline [99-09-2]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
4-Chloroaniline [106-47-8]^	4.3	U	ug/L	1	4.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
4-Nitroaniline [100-01-6]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Benzoic acid [65-85-0]^	15	U	ug/L	1	15	50	7J27017	EPA 8270D	10/29/17 16:54	jfi	J-06
Benzyl alcohol [100-51-6]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	

ANALYTICAL RESULTS

Description: SB-3 **Lab Sample ID:** AA07481-03 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 15:46 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Dibenzofuran [132-64-9]^	2.8	U	ug/L	1	2.8	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	
Pyridine [110-86-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 16:54	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*46*	*1*	*50.0*	*93 %*	*33-145*	*7J27017*	*EPA 8270D*	*10/29/17 16:54*	*jfi*	
2-Fluorobiphenyl	*42*	*1*	*50.0*	*84 %*	*32-116*	*7J27017*	*EPA 8270D*	*10/29/17 16:54*	*jfi*	
2-Fluorophenol	*16*	*1*	*50.0*	*32 %*	*11-100*	*7J27017*	*EPA 8270D*	*10/29/17 16:54*	*jfi*	
Nitrobenzene-d5	*30*	*1*	*50.0*	*60 %*	*24-107*	*7J27017*	*EPA 8270D*	*10/29/17 16:54*	*jfi*	
Phenol-d5	*11*	*1*	*50.0*	*22 %*	*10-100*	*7J27017*	*EPA 8270D*	*10/29/17 16:54*	*jfi*	
Terphenyl-d14	*44*	*1*	*50.0*	*87 %*	*52-150*	*7J27017*	*EPA 8270D*	*10/29/17 16:54*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.047	U	ug/L	1	0.047	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
2-Methylnaphthalene [91-57-6]^	0.044	U	ug/L	1	0.044	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Acenaphthene [83-32-9]^	**0.25**		ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Acenaphthylene [208-96-8]^	0.036	U	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Anthracene [120-12-7]^	0.036	U	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Benzo(a)anthracene [56-55-3]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Benzo(a)pyrene [50-32-8]^	0.043	U	ug/L	1	0.043	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.059	U	ug/L	1	0.059	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.040	U	ug/L	1	0.040	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.046	U	ug/L	1	0.046	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Chrysene [218-01-9]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.026	U	ug/L	1	0.026	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Fluoranthene [206-44-0]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Fluorene [86-73-7]^	0.038	U	ug/L	1	0.038	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Naphthalene [91-20-3]^	0.035	U	ug/L	1	0.035	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	

ANALYTICAL RESULTS

Description: SB-3 **Lab Sample ID:** AA07481-03 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 15:46 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.039	U	ug/L	1	0.039	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	
Pyrene [129-00-0]^	0.048	U	ug/L	1	0.048	0.10	7J30041	EPA 8270D	11/01/17 20:16	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*5.9*	*1*	*5.71*	*103 %*	*61-151*	*7J30041*	*EPA 8270D*	*11/01/17 20:16*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.090	U	ug/L	5	0.090	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
4,4'-DDE [72-55-9]^	0.18	U	ug/L	5	0.18	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
4,4'-DDT [50-29-3]^	0.12	U	ug/L	5	0.12	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QL-02, QV-01
Aldrin [309-00-2]^	0.16	U	ug/L	5	0.16	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
alpha-BHC [319-84-6]^	0.13	U	ug/L	5	0.13	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
beta-BHC [319-85-7]^	0.11	U	ug/L	5	0.11	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Chlordane (tech) [12789-03-6]^	1.8	U	ug/L	5	1.8	2.5	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Chlordane-alpha [5103-71-9]^	0.11	U	ug/L	5	0.11	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Chlordane-gamma [5566-34-7]^	0.090	U	ug/L	5	0.090	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
delta-BHC [319-86-8]^	0.095	U	ug/L	5	0.095	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Dieldrin [60-57-1]^	0.085	U	ug/L	5	0.085	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Endosulfan I [959-98-8]^	0.080	U	ug/L	5	0.080	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Endosulfan II [33213-65-9]^	0.085	U	ug/L	5	0.085	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QV-01
Endosulfan sulfate [1031-07-8]^	0.080	U	ug/L	5	0.080	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QV-01
Endrin [72-20-8]^	0.070	U	ug/L	5	0.070	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QV-01
Endrin aldehyde [7421-93-4]^	0.10	U	ug/L	5	0.10	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Endrin ketone [53494-70-5]^	0.085	U	ug/L	5	0.085	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QV-01
gamma-BHC [58-89-9]^	0.10	U	ug/L	5	0.10	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QV-01
Heptachlor [76-44-8]^	0.090	U	ug/L	5	0.090	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QV-01
Heptachlor epoxide [1024-57-3]^	0.090	U	ug/L	5	0.090	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Isodrin [465-73-6]^	0.15	U	ug/L	5	0.15	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03
Methoxychlor [72-43-5]^	0.10	U	ug/L	5	0.10	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QL-02, QV-01
Mirex [2385-85-5]^	0.17	U	ug/L	5	0.17	0.25	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03, QV-01
Toxaphene [8001-35-2]^	2.4	U	ug/L	5	2.4	2.5	7J30039	EPA 8081B	10/31/17 12:08	JJB	QI-03

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.70*	*5*	*1.00*	*70 %*	*38-142*	*7J30039*	*EPA 8081B*	*10/31/17 12:08*	*JJB*	*QI-03*
Decachlorobiphenyl	*1.2*	*5*	*1.00*	*120 %*	*34-159*	*7J30039*	*EPA 8081B*	*10/31/17 12:08*	*JJB*	*QI-03*

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes

ANALYTICAL RESULTS

Description: SB-3 **Lab Sample ID:** AA07481-03 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 15:46 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 19:02	JJB	
PCB-1221 [11104-28-2]^	0.46	U	ug/L	1	0.46	0.50	7K01019	EPA 8082A	11/01/17 19:02	JJB	
PCB-1232 [11141-16-5]^	0.47	U	ug/L	1	0.47	0.50	7K01019	EPA 8082A	11/01/17 19:02	JJB	
PCB-1248 [12672-29-6]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 19:02	JJB	
PCB-1254 [11097-69-1]^	0.50	U	ug/L	1	0.50	0.50	7K01019	EPA 8082A	11/01/17 19:02	JJB	
PCB-1260 [11096-82-5]^	0.48	U	ug/L	1	0.48	0.50	7K01019	EPA 8082A	11/01/17 19:02	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.88*	*1*	*1.00*	*88 %*	*38-142*	*7K01019*	*EPA 8082A*	*11/01/17 19:02*	*JJB*	
Decachlorobiphenyl	*0.69*	*1*	*1.00*	*69 %*	*34-159*	*7K01019*	*EPA 8082A*	*11/01/17 19:02*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	100	U	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 07:47	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*360*	*1*	*400*	*91 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 07:47*	*JJB*	
o-Terphenyl	*220*	*1*	*201*	*108 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 07:47*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.0230	U	ug/L	1	0.0230	0.200	7J30018	EPA 7470A	10/31/17 09:40	EIC	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**24.2**		ug/L	1	8.00	10.0	7J30001	EPA 6010C	10/31/17 10:57	ACV	
Barium [7440-39-3]^	**63.3**		ug/L	1	2.00	10.0	7J30001	EPA 6010C	10/31/17 10:57	ACV	
Cadmium [7440-43-9]^	0.450	U	ug/L	1	0.450	1.00	7J30001	EPA 6010C	10/31/17 10:57	ACV	
Chromium [7440-47-3]^	1.10	U	ug/L	1	1.10	10.0	7J30001	EPA 6010C	10/31/17 10:57	ACV	
Lead [7439-92-1]^	**6.66**	I	ug/L	1	3.80	10.0	7J30001	EPA 6010C	10/31/17 10:57	ACV	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	40.0	7J30001	EPA 6010C	10/31/17 10:57	ACV	
Silver [7440-22-4]^	**0.821**	I	ug/L	1	0.740	10.0	7J30001	EPA 6010C	10/31/17 10:57	ACV	

ANALYTICAL RESULTS

Description: SB-4 **Lab Sample ID:** AA07481-04 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 17:15 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 03:25	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 03:25	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 03:25	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 03:25	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 03:25	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 03:25	KKW	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 03:25	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*52*	*1*	*50.0*	*103 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 03:25*	*KKW*	
Dibromofluoromethane	*50*	*1*	*50.0*	*100 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 03:25*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*104 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 03:25*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
1,2-Dichlorobenzene [95-50-1]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
1,3-Dichlorobenzene [541-73-1]^	3.4	U	ug/L	1	3.4	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
1,4-Dichlorobenzene [106-46-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2,4,5-Trichlorophenol [95-95-4]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2-Methylphenol [95-48-7]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2-Nitroaniline [88-74-4]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
3-Nitroaniline [99-09-2]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
4-Chloroaniline [106-47-8]^	4.3	U	ug/L	1	4.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
4-Nitroaniline [100-01-6]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Benzoic acid [65-85-0]^	15	U	ug/L	1	15	50	7J27017	EPA 8270D	10/29/17 17:24	jfi	J-06
Benzyl alcohol [100-51-6]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	

ANALYTICAL RESULTS

Description: SB-4 **Lab Sample ID:** AA07481-04 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 17:15 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Dibenzofuran [132-64-9]^	2.8	U	ug/L	1	2.8	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	
Pyridine [110-86-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 17:24	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*31*	*1*	*50.0*	*62 %*	*33-145*	*7J27017*	*EPA 8270D*	*10/29/17 17:24*	*jfi*	
2-Fluorobiphenyl	*38*	*1*	*50.0*	*76 %*	*32-116*	*7J27017*	*EPA 8270D*	*10/29/17 17:24*	*jfi*	
2-Fluorophenol	*11*	*1*	*50.0*	*22 %*	*11-100*	*7J27017*	*EPA 8270D*	*10/29/17 17:24*	*jfi*	
Nitrobenzene-d5	*28*	*1*	*50.0*	*57 %*	*24-107*	*7J27017*	*EPA 8270D*	*10/29/17 17:24*	*jfi*	
Phenol-d5	*7.8*	*1*	*50.0*	*16 %*	*10-100*	*7J27017*	*EPA 8270D*	*10/29/17 17:24*	*jfi*	
Terphenyl-d14	*42*	*1*	*50.0*	*84 %*	*52-150*	*7J27017*	*EPA 8270D*	*10/29/17 17:24*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.047	U	ug/L	1	0.047	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
2-Methylnaphthalene [91-57-6]^	0.044	U	ug/L	1	0.044	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Acenaphthene [83-32-9]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Acenaphthylene [208-96-8]^	0.036	U	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Anthracene [120-12-7]^	0.036	U	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Benzo(a)anthracene [56-55-3]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Benzo(a)pyrene [50-32-8]^	0.043	U	ug/L	1	0.043	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.059	U	ug/L	1	0.059	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.040	U	ug/L	1	0.040	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.046	U	ug/L	1	0.046	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Chrysene [218-01-9]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.026	U	ug/L	1	0.026	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Fluoranthene [206-44-0]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Fluorene [86-73-7]^	0.038	U	ug/L	1	0.038	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Naphthalene [91-20-3]^	0.035	U	ug/L	1	0.035	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	

ANALYTICAL RESULTS

Description: SB-4 **Lab Sample ID:** AA07481-04 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 17:15 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.039	U	ug/L	1	0.039	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	
Pyrene [129-00-0]^	0.048	U	ug/L	1	0.048	0.10	7J30041	EPA 8270D	11/01/17 20:38	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*10*	*1*	*5.71*	*176 %*	*61-151*	*7J30041*	*EPA 8270D*	*11/01/17 20:38*	*jfi*	*QS-03*

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
4,4'-DDE [72-55-9]^	0.036	U	ug/L	1	0.036	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
4,4'-DDT [50-29-3]^	0.025	U	ug/L	1	0.025	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.032	U	ug/L	1	0.032	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
alpha-BHC [319-84-6]^	0.026	U	ug/L	1	0.026	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
beta-BHC [319-85-7]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Chlordane (tech) [12789-03-6]^	0.36	U	ug/L	1	0.36	0.50	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Chlordane-alpha [5103-71-9]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Chlordane-gamma [5566-34-7]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
delta-BHC [319-86-8]^	0.019	U	ug/L	1	0.019	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Dieldrin [60-57-1]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Endosulfan I [959-98-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Endosulfan II [33213-65-9]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QV-01
Endrin [72-20-8]^	0.014	U	ug/L	1	0.014	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QV-01
Endrin aldehyde [7421-93-4]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Endrin ketone [53494-70-5]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QV-01
gamma-BHC [58-89-9]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QV-01
Heptachlor [76-44-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Isodrin [465-73-6]^	0.030	U	ug/L	1	0.030	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	
Methoxychlor [72-43-5]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QL-02, QV-01
Mirex [2385-85-5]^	0.034	U	ug/L	1	0.034	0.050	7J30039	EPA 8081B	10/31/17 10:41	JJB	QV-01
Toxaphene [8001-35-2]^	0.48	U	ug/L	1	0.48	0.50	7J30039	EPA 8081B	10/31/17 10:41	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.53*	*1*	*1.00*	*53 %*	*38-142*	*7J30039*	*EPA 8081B*	*10/31/17 10:41*	*JJB*	
Decachlorobiphenyl	*0.53*	*1*	*1.00*	*53 %*	*34-159*	*7J30039*	*EPA 8081B*	*10/31/17 10:41*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 19:26	JJB	
PCB-1221 [11104-28-2]^	0.46	U	ug/L	1	0.46	0.50	7K01019	EPA 8082A	11/01/17 19:26	JJB	
PCB-1232 [11141-16-5]^	0.47	U	ug/L	1	0.47	0.50	7K01019	EPA 8082A	11/01/17 19:26	JJB	
PCB-1248 [12672-29-6]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 19:26	JJB	
PCB-1254 [11097-69-1]^	0.50	U	ug/L	1	0.50	0.50	7K01019	EPA 8082A	11/01/17 19:26	JJB	
PCB-1260 [11096-82-5]^	0.48	U	ug/L	1	0.48	0.50	7K01019	EPA 8082A	11/01/17 19:26	JJB	

ANALYTICAL RESULTS

Description: SB-4 **Lab Sample ID:** AA07481-04 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 17:15 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
2,4,5,6-TCMX	*0.39*	*1*	*0.990*	*39 %*	*38-142*	*7K01019*	*EPA 8082A*	*11/01/17 19:26*	*JJB*	
Decachlorobiphenyl	*0.76*	*1*	*0.990*	*77 %*	*34-159*	*7K01019*	*EPA 8082A*	*11/01/17 19:26*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	100	U	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 08:20	JJB	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
n-Nonatriacontane	*310*	*1*	*400*	*78 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 08:20*	*JJB*	
o-Terphenyl	*190*	*1*	*201*	*92 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 08:20*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.0230	U	ug/L	1	0.0230	0.200	7J30018	EPA 7470A	10/31/17 09:43	EIC	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**26.8**		ug/L	1	8.00	10.0	7J30001	EPA 6010C	10/31/17 10:59	ACV	
Barium [7440-39-3]^	**36.0**		ug/L	1	2.00	10.0	7J30001	EPA 6010C	10/31/17 10:59	ACV	
Cadmium [7440-43-9]^	**0.567**	I	ug/L	1	0.450	1.00	7J30001	EPA 6010C	10/31/17 10:59	ACV	
Chromium [7440-47-3]^	**2.12**	I	ug/L	1	1.10	10.0	7J30001	EPA 6010C	10/31/17 10:59	ACV	
Lead [7439-92-1]^	**9.07**	I	ug/L	1	3.80	10.0	7J30001	EPA 6010C	10/31/17 10:59	ACV	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	40.0	7J30001	EPA 6010C	10/31/17 10:59	ACV	
Silver [7440-22-4]^	0.740	U	ug/L	1	0.740	10.0	7J30001	EPA 6010C	10/31/17 10:59	ACV	

ANALYTICAL RESULTS

Description: SB-5 **Lab Sample ID:** AA07481-05 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 17:53 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 03:54	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 03:54	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 03:54	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 03:54	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 03:54	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 03:54	KKW	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 03:54	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*101 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 03:54*	*KKW*	
Dibromofluoromethane	*49*	*1*	*50.0*	*98 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 03:54*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*104 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 03:54*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
1,2-Dichlorobenzene [95-50-1]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
1,3-Dichlorobenzene [541-73-1]^	3.4	U	ug/L	1	3.4	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
1,4-Dichlorobenzene [106-46-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2,4,5-Trichlorophenol [95-95-4]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2-Methylphenol [95-48-7]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2-Nitroaniline [88-74-4]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
3-Nitroaniline [99-09-2]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
4-Chloroaniline [106-47-8]^	4.3	U	ug/L	1	4.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
4-Nitroaniline [100-01-6]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Benzoic acid [65-85-0]^	15	U	ug/L	1	15	50	7J27017	EPA 8270D	10/29/17 17:55	jfi	J-06
Benzyl alcohol [100-51-6]^	3.9	U	ug/L	1	3.9	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	

ANALYTICAL RESULTS

Description: SB-5 **Lab Sample ID:** AA07481-05 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 17:53 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Dibenzofuran [132-64-9]^	2.8	U	ug/L	1	2.8	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	
Pyridine [110-86-1]^	3.5	U	ug/L	1	3.5	10	7J27017	EPA 8270D	10/29/17 17:55	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*22*	*1*	*49.5*	*44 %*	*33-145*	*7J27017*	*EPA 8270D*	*10/29/17 17:55*	*jfi*	
2-Fluorobiphenyl	*31*	*1*	*49.5*	*63 %*	*32-116*	*7J27017*	*EPA 8270D*	*10/29/17 17:55*	*jfi*	
2-Fluorophenol	*5.7*	*1*	*49.5*	*11 %*	*11-100*	*7J27017*	*EPA 8270D*	*10/29/17 17:55*	*jfi*	
Nitrobenzene-d5	*21*	*1*	*49.5*	*42 %*	*24-107*	*7J27017*	*EPA 8270D*	*10/29/17 17:55*	*jfi*	
Phenol-d5	*4.3*	*1*	*49.5*	*9 %*	*10-100*	*7J27017*	*EPA 8270D*	*10/29/17 17:55*	*jfi*	*QS-05*
Terphenyl-d14	*37*	*1*	*49.5*	*76 %*	*52-150*	*7J27017*	*EPA 8270D*	*10/29/17 17:55*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.047	U	ug/L	1	0.047	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
2-Methylnaphthalene [91-57-6]^	0.044	U	ug/L	1	0.044	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Acenaphthene [83-32-9]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Acenaphthylene [208-96-8]^	0.036	U	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Anthracene [120-12-7]^	0.036	U	ug/L	1	0.036	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Benzo(a)anthracene [56-55-3]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Benzo(a)pyrene [50-32-8]^	0.043	U	ug/L	1	0.043	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.059	U	ug/L	1	0.059	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.040	U	ug/L	1	0.040	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.046	U	ug/L	1	0.046	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Chrysene [218-01-9]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.026	U	ug/L	1	0.026	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Fluoranthene [206-44-0]^	0.051	U	ug/L	1	0.051	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Fluorene [86-73-7]^	0.038	U	ug/L	1	0.038	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.037	U	ug/L	1	0.037	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Naphthalene [91-20-3]^	0.035	U	ug/L	1	0.035	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	

ANALYTICAL RESULTS

Description: SB-5 **Lab Sample ID:** AA07481-05 **Received:** 10/27/17 08:00

Matrix: Ground Water **Sampled:** 10/25/17 17:53 **Work Order:** AA07481

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.039	U	ug/L	1	0.039	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	
Pyrene [129-00-0]^	0.048	U	ug/L	1	0.048	0.10	7J30041	EPA 8270D	11/01/17 21:00	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*3.2*	*1*	*5.71*	*57 %*	*61-151*	*7J30041*	*EPA 8270D*	*11/01/17 21:00*	*jfi*	*QS-03*

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
4,4'-DDE [72-55-9]^	0.036	U	ug/L	1	0.036	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
4,4'-DDT [50-29-3]^	0.025	U	ug/L	1	0.025	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.032	U	ug/L	1	0.032	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
alpha-BHC [319-84-6]^	0.026	U	ug/L	1	0.026	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
beta-BHC [319-85-7]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Chlordane (tech) [12789-03-6]^	0.36	U	ug/L	1	0.36	0.50	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Chlordane-alpha [5103-71-9]^	0.022	U	ug/L	1	0.022	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Chlordane-gamma [5566-34-7]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
delta-BHC [319-86-8]^	0.019	U	ug/L	1	0.019	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Dieldrin [60-57-1]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Endosulfan I [959-98-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Endosulfan II [33213-65-9]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.016	U	ug/L	1	0.016	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01
Endrin [72-20-8]^	0.014	U	ug/L	1	0.014	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01
Endrin aldehyde [7421-93-4]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Endrin ketone [53494-70-5]^	0.017	U	ug/L	1	0.017	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01
gamma-BHC [58-89-9]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01
Heptachlor [76-44-8]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.018	U	ug/L	1	0.018	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Isodrin [465-73-6]^	0.030	U	ug/L	1	0.030	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	
Methoxychlor [72-43-5]^	0.020	U	ug/L	1	0.020	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01, QL-02
Mirex [2385-85-5]^	0.034	U	ug/L	1	0.034	0.050	7J30039	EPA 8081B	10/31/17 10:53	JJB	QV-01
Toxaphene [8001-35-2]^	0.48	U	ug/L	1	0.48	0.50	7J30039	EPA 8081B	10/31/17 10:53	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.80*	*1*	*1.00*	*80 %*	*38-142*	*7J30039*	*EPA 8081B*	*10/31/17 10:53*	*JJB*	
Decachlorobiphenyl	*0.45*	*1*	*1.00*	*45 %*	*34-159*	*7J30039*	*EPA 8081B*	*10/31/17 10:53*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 19:38	JJB	
PCB-1221 [11104-28-2]^	0.46	U	ug/L	1	0.46	0.50	7K01019	EPA 8082A	11/01/17 19:38	JJB	
PCB-1232 [11141-16-5]^	0.47	U	ug/L	1	0.47	0.50	7K01019	EPA 8082A	11/01/17 19:38	JJB	
PCB-1248 [12672-29-6]^	0.49	U	ug/L	1	0.49	0.50	7K01019	EPA 8082A	11/01/17 19:38	JJB	
PCB-1254 [11097-69-1]^	0.50	U	ug/L	1	0.50	0.50	7K01019	EPA 8082A	11/01/17 19:38	JJB	
PCB-1260 [11096-82-5]^	0.48	U	ug/L	1	0.48	0.50	7K01019	EPA 8082A	11/01/17 19:38	JJB	

ANALYTICAL RESULTS

Description: SB-5 **Lab Sample ID:** AA07481-05 **Received:** 10/27/17 08:00
Matrix: Ground Water **Sampled:** 10/25/17 17:53 **Work Order:** AA07481
Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
2,4,5,6-TCMX	*10*	*1*	*1.00*	*1010 %*	*38-142*	*7K01019*	*EPA 8082A*	*11/01/17 19:38*	*JJB*	*E, QS-06*
Decachlorobiphenyl	*0.59*	*1*	*1.00*	*59 %*	*34-159*	*7K01019*	*EPA 8082A*	*11/01/17 19:38*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	100	U	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 08:54	JJB	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
n-Nonatriacontane	*300*	*1*	*400*	*74 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 08:54*	*JJB*	
o-Terphenyl	*150*	*1*	*201*	*77 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 08:54*	*JJB*	*QS-05*

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.0230	U	ug/L	1	0.0230	0.200	7J30018	EPA 7470A	10/31/17 09:46	EIC	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**17.1**		ug/L	1	8.00	10.0	7J30001	EPA 6010C	10/31/17 11:01	ACV	
Barium [7440-39-3]^	**6.96**	I	ug/L	1	2.00	10.0	7J30001	EPA 6010C	10/31/17 11:01	ACV	
Cadmium [7440-43-9]^	0.450	U	ug/L	1	0.450	1.00	7J30001	EPA 6010C	10/31/17 11:01	ACV	
Chromium [7440-47-3]^	**4.44**	I	ug/L	1	1.10	10.0	7J30001	EPA 6010C	10/31/17 11:01	ACV	
Lead [7439-92-1]^	**4.58**	I	ug/L	1	3.80	10.0	7J30001	EPA 6010C	10/31/17 11:01	ACV	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	40.0	7J30001	EPA 6010C	10/31/17 11:01	ACV	
Silver [7440-22-4]^	**0.834**	I	ug/L	1	0.740	10.0	7J30001	EPA 6010C	10/31/17 11:01	ACV	

Description: TRIP BLANK **Lab Sample ID:** AA07481-06 **Received:** 10/27/17 08:00
Matrix: Water **Sampled:** 10/25/17 00:00 **Work Order:** AA07481
Project: Manatee County - Port Manatee **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7J31014	EPA 8260B	10/31/17 16:46	NLM	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7J31014	EPA 8260B	10/31/17 16:46	NLM	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 16:46	NLM	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7J31014	EPA 8260B	10/31/17 16:46	NLM	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7J31014	EPA 8260B	10/31/17 16:46	NLM	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7J31014	EPA 8260B	10/31/17 16:46	NLM	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 16:46	NLM	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
4-Bromofluorobenzene	*50*	*1*	*50.0*	*100 %*	*41-142*	*7J31014*	*EPA 8260B*	*10/31/17 16:46*	*NLM*	
Dibromofluoromethane	*50*	*1*	*50.0*	*100 %*	*53-146*	*7J31014*	*EPA 8260B*	*10/31/17 16:46*	*NLM*	
Toluene-d8	*54*	*1*	*50.0*	*107 %*	*41-146*	*7J31014*	*EPA 8260B*	*10/31/17 16:46*	*NLM*	

ANALYTICAL RESULTS

Description: TRIP BLANK | **Lab Sample ID:** AA07481-07 | **Received:** 10/27/17 08:00

Matrix: Water | **Sampled:** 10/25/17 00:00 | **Work Order:** AA07481

Project: Manatee County - Port Manatee | **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7J31014	EPA 8260B	10/31/17 17:15	NLM	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7J31014	EPA 8260B	10/31/17 17:15	NLM	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 17:15	NLM	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7J31014	EPA 8260B	10/31/17 17:15	NLM	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7J31014	EPA 8260B	10/31/17 17:15	NLM	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7J31014	EPA 8260B	10/31/17 17:15	NLM	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 17:15	NLM	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*101 %*	*41-142*	*7J31014*	*EPA 8260B*	*10/31/17 17:15*	*NLM*	
Dibromofluoromethane	*50*	*1*	*50.0*	*101 %*	*53-146*	*7J31014*	*EPA 8260B*	*10/31/17 17:15*	*NLM*	
Toluene-d8	*55*	*1*	*50.0*	*109 %*	*41-146*	*7J31014*	*EPA 8260B*	*10/31/17 17:15*	*NLM*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7J31014 - EPA 5030B_MS

Blank (7J31014-BLK1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 13:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.71	U	1.0	ug/L							
Ethylbenzene	0.69	U	1.0	ug/L							
m,p-Xylenes	1.3	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.60	U	1.0	ug/L							
o-Xylene	0.53	U	1.0	ug/L							
Toluene	0.72	U	1.0	ug/L							
Xylenes (Total)	1.3	U	2.0	ug/L							
4-Bromofluorobenzene	*48*			*ug/L*	*50.0*		*96*	*41-142*			
Dibromofluoromethane	*49*			*ug/L*	*50.0*		*98*	*53-146*			
Toluene-d8	*51*			*ug/L*	*50.0*		*101*	*41-146*			

LCS (7J31014-BS1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 10:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	15		1.0	ug/L	20.0		76	56-136			
Toluene	17		1.0	ug/L	20.0		83	64-131			
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*105*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

Matrix Spike (7J31014-MS1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 11:22

Source: AA06392-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	23		1.0	ug/L	20.0	4.6	91	56-136			
Toluene	24		1.0	ug/L	20.0	3.1	106	64-131			
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*103*	*41-142*			
Dibromofluoromethane	*49*			*ug/L*	*50.0*		*98*	*53-146*			
Toluene-d8	*50*			*ug/L*	*50.0*		*100*	*41-146*			

Matrix Spike Dup (7J31014-MSD1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 11:51

Source: AA06392-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	24		1.0	ug/L	20.0	4.6	100	56-136	7	14	
Toluene	25		1.0	ug/L	20.0	3.1	111	64-131	4	16	
4-Bromofluorobenzene	*54*			*ug/L*	*50.0*		*109*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*54*			*ug/L*	*50.0*		*107*	*41-146*			

Batch 7K01025 - EPA 5030B_MS

Blank (7K01025-BLK1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 22:08

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.71	U	1.0	ug/L							
Ethylbenzene	0.69	U	1.0	ug/L							
m,p-Xylenes	1.3	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.60	U	1.0	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7K01025 - EPA 5030B_MS - Continued

Blank (7K01025-BLK1) Continued Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 22:08

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	0.53	U	1.0	ug/L							
Toluene	0.72	U	1.0	ug/L							
Xylenes (Total)	1.3	U	2.0	ug/L							
4-Bromofluorobenzene	*51*			*ug/L*	*50.0*		*103*	*41-142*			
Dibromofluoromethane	*48*			*ug/L*	*50.0*		*97*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

LCS (7K01025-BS1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 19:44

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	22		1.0	ug/L	20.0		110	56-136			
Toluene	23		1.0	ug/L	20.0		117	64-131			
4-Bromofluorobenzene	*50*			*ug/L*	*50.0*		*100*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*101*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

Matrix Spike (7K01025-MS1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 20:13

Source: AA06791-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	90		1.0	ug/L	20.0	74	81	56-136			
Toluene	120	L	1.0	ug/L	20.0	100	82	64-131			
4-Bromofluorobenzene	*51*			*ug/L*	*50.0*		*102*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

Matrix Spike Dup (7K01025-MSD1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 20:42

Source: AA06791-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	84		1.0	ug/L	20.0	74	49	56-136	7	14	QM-17
Toluene	110	L	1.0	ug/L	20.0	100	41	64-131	7	16	QM-17
4-Bromofluorobenzene	*51*			*ug/L*	*50.0*		*101*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27017 - EPA 3510C_MS

Blank (7J27017-BLK1) Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 09:46

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	3.3	U	10	ug/L							
1,2-Dichlorobenzene	3.2	U	10	ug/L							
1,3-Dichlorobenzene	3.4	U	10	ug/L							
1,4-Dichlorobenzene	3.2	U	10	ug/L							
2,4,5-Trichlorophenol	3.9	U	10	ug/L							
2,4,6-Trichlorophenol	6.4	U	10	ug/L							

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27017 - EPA 3510C_MS - Continued

Blank (7J27017-BLK1) Continued Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 09:46

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2,4-Dichlorophenol	6.5	U	10	ug/L							
2,4-Dimethylphenol	6.4	U	10	ug/L							
2,4-Dinitrophenol	7.7	U	10	ug/L							
2,4-Dinitrotoluene	3.2	U	10	ug/L							
2,6-Dinitrotoluene	2.9	U	10	ug/L							
2-Chloronaphthalene	3.2	U	10	ug/L							
2-Chlorophenol	7.4	U	10	ug/L							
2-Methyl-4,6-dinitrophenol	6.0	U	10	ug/L							
2-Methylphenol	3.5	U	10	ug/L							
2-Nitroaniline	3.3	U	10	ug/L							
2-Nitrophenol	5.2	U	10	ug/L							
3 & 4-Methylphenol	8.2	U	10	ug/L							
3,3'-Dichlorobenzidine	3.3	U	10	ug/L							
3-Nitroaniline	3.3	U	10	ug/L							
4-Bromophenyl-phenylether	3.3	U	10	ug/L							
4-Chloro-3-methylphenol	7.3	U	10	ug/L							
4-Chloroaniline	4.3	U	10	ug/L							
4-Chlorophenyl-phenylether	3.2	U	10	ug/L							
4-Nitroaniline	3.2	U	10	ug/L							
4-Nitrophenol	7.9	U	10	ug/L							
Benzidine	7.1	U	10	ug/L							
Benzoic acid	15	U	50	ug/L							
Benzyl alcohol	3.9	U	10	ug/L							
Bis(2-chloroethoxy)methane	3.3	U	10	ug/L							
Bis(2-chloroethyl)ether	3.8	U	10	ug/L							
Bis(2-chloroisopropyl)ether	3.5	U	10	ug/L							
Bis(2-ethylhexyl)phthalate	3.5	U	5.0	ug/L							
Butylbenzylphthalate	5.1	U	10	ug/L							
Dibenzofuran	2.8	U	10	ug/L							
Diethylphthalate	3.0	U	10	ug/L							
Dimethylphthalate	3.0	U	10	ug/L							
Di-n-butylphthalate	3.2	U	10	ug/L							
Di-n-octylphthalate	4.7	U	10	ug/L							
Hexachlorobenzene	3.0	U	10	ug/L							
Hexachlorobutadiene	4.1	U	10	ug/L							
Hexachlorocyclopentadiene	3.8	U	10	ug/L							
Hexachloroethane	3.0	U	10	ug/L							
Isophorone	4.5	U	10	ug/L							
Nitrobenzene	3.2	U	10	ug/L							
N-Nitrosodimethylamine	3.8	U	10	ug/L							
N-Nitroso-di-n-propylamine	4.5	U	10	ug/L							
N-nitrosodiphenylamine/Diphenylamine	5.4	U	10	ug/L							
Pentachlorophenol	8.2	U	10	ug/L							
Phenol	5.6	U	10	ug/L							
Pyridine	3.5	U	10	ug/L							
2,4,6-Tribromophenol	*43*			*ug/L*	*50.0*		*86*	*33-145*			
2-Fluorobiphenyl	*33*			*ug/L*	*50.0*		*67*	*32-116*			
2-Fluorophenol	*15*			*ug/L*	*50.0*		*30*	*11-100*			
Nitrobenzene-d5	*28*			*ug/L*	*50.0*		*56*	*24-107*			

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27017 - EPA 3510C_MS - Continued

Blank (7J27017-BLK1) Continued Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 09:46

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Phenol-d5	*11*			*ug/L*	*50.0*		*21*	*10-100*			
Terphenyl-d14	*48*			*ug/L*	*50.0*		*95*	*52-150*			

Blank (7J27017-BLK2) Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 10:16

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	16	U	50	ug/L							
1,2-Dichlorobenzene	16	U	50	ug/L							
1,3-Dichlorobenzene	17	U	50	ug/L							
1,4-Dichlorobenzene	16	U	50	ug/L							
2,4,5-Trichlorophenol	20	U	50	ug/L							
2,4,6-Trichlorophenol	32	U	50	ug/L							
2,4-Dichlorophenol	32	U	50	ug/L							
2,4-Dimethylphenol	32	U	50	ug/L							
2,4-Dinitrophenol	38	U	50	ug/L							
2,4-Dinitrotoluene	16	U	50	ug/L							
2,6-Dinitrotoluene	14	U	50	ug/L							
2-Chloronaphthalene	16	U	50	ug/L							
2-Chlorophenol	37	U	50	ug/L							
2-Methyl-4,6-dinitrophenol	30	U	50	ug/L							
2-Methylphenol	18	U	50	ug/L							
2-Nitroaniline	16	U	50	ug/L							
2-Nitrophenol	26	U	50	ug/L							
3 & 4-Methylphenol	41	U	50	ug/L							
3,3'-Dichlorobenzidine	16	U	50	ug/L							
3-Nitroaniline	16	U	50	ug/L							
4-Bromophenyl-phenylether	16	U	50	ug/L							
4-Chloro-3-methylphenol	36	U	50	ug/L							
4-Chloroaniline	22	U	50	ug/L							
4-Chlorophenyl-phenylether	16	U	50	ug/L							
4-Nitroaniline	16	U	50	ug/L							
4-Nitrophenol	40	U	50	ug/L							
Benzidine	36	U	50	ug/L							
Benzoic acid	75	U	250	ug/L							
Benzyl alcohol	20	U	50	ug/L							
Bis(2-chloroethoxy)methane	16	U	50	ug/L							
Bis(2-chloroethyl)ether	19	U	50	ug/L							
Bis(2-chloroisopropyl)ether	18	U	50	ug/L							
Bis(2-ethylhexyl)phthalate	18	U	25	ug/L							
Butylbenzylphthalate	26	U	50	ug/L							
Dibenzofuran	14	U	50	ug/L							
Diethylphthalate	15	U	50	ug/L							
Dimethylphthalate	15	U	50	ug/L							
Di-n-butylphthalate	16	U	50	ug/L							
Di-n-octylphthalate	24	U	50	ug/L							
Hexachlorobenzene	15	U	50	ug/L							
Hexachlorobutadiene	20	U	50	ug/L							
Hexachlorocyclopentadiene	19	U	50	ug/L							
Hexachloroethane	15	U	50	ug/L							

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27017 - EPA 3510C_MS - Continued

Blank (7J27017-BLK2) Continued Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 10:16

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Isophorone	22	U	50	ug/L							
Nitrobenzene	16	U	50	ug/L							
N-Nitrosodimethylamine	19	U	50	ug/L							
N-Nitroso-di-n-propylamine	22	U	50	ug/L							
N-nitrosodiphenylamine/Diphenylamine	27	U	50	ug/L							
Pentachlorophenol	41	U	50	ug/L							
Phenol	28	U	50	ug/L							
Pyridine	18	U	50	ug/L							
2,4,6-Tribromophenol	*230*			*ug/L*	*250*		*91*	*33-145*			
2-Fluorobiphenyl	*190*			*ug/L*	*250*		*76*	*32-116*			
2-Fluorophenol	*84*			*ug/L*	*250*		*33*	*11-100*			
Nitrobenzene-d5	*160*			*ug/L*	*250*		*63*	*24-107*			
Phenol-d5	*60*			*ug/L*	*250*		*24*	*10-100*			
Terphenyl-d14	*250*			*ug/L*	*250*		*100*	*52-150*			

LCS (7J27017-BS1) Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 10:47

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	22		10	ug/L	50.0		43	10-102			
1,4-Dichlorobenzene	24		10	ug/L	50.0		47	10-101			
2,4-Dinitrotoluene	62		10	ug/L	50.0		124	52-158			
2-Chlorophenol	29		10	ug/L	50.0		57	17-110			
4-Chloro-3-methylphenol	41		10	ug/L	50.0		82	35-131			
4-Nitrophenol	9.0	I	10	ug/L	50.0		18	10-94			
N-Nitroso-di-n-propylamine	57		10	ug/L	50.0		114	26-135			
Pentachlorophenol	8.1	I	10	ug/L	50.0		16	5-139			
Phenol	14		10	ug/L	50.0		28	10-60			
2,4,6-Tribromophenol	*37*			*ug/L*	*50.0*		*73*	*33-145*			
2-Fluorobiphenyl	*48*			*ug/L*	*50.0*		*97*	*32-116*			
2-Fluorophenol	*14*			*ug/L*	*50.0*		*27*	*11-100*			
Nitrobenzene-d5	*40*			*ug/L*	*50.0*		*81*	*24-107*			
Phenol-d5	*13*			*ug/L*	*50.0*		*27*	*10-100*			
Terphenyl-d14	*52*			*ug/L*	*50.0*		*104*	*52-150*			

Matrix Spike (7J27017-MS1) Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 11:17

Source: AA07548-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	22		10	ug/L	50.0	3.3 U	44	10-102			
1,4-Dichlorobenzene	24		10	ug/L	50.0	3.2 U	48	10-101			
2,4-Dinitrotoluene	60		10	ug/L	50.0	3.2 U	120	52-158			
2-Chlorophenol	38		10	ug/L	50.0	7.4 U	76	17-110			
4-Chloro-3-methylphenol	44		10	ug/L	50.0	7.3 U	88	35-131			
4-Nitrophenol	22		10	ug/L	50.0	7.9 U	44	10-94			
N-Nitroso-di-n-propylamine	54		10	ug/L	50.0	4.5 U	108	26-135			
Pentachlorophenol	32		10	ug/L	50.0	8.2 U	64	5-139			
Phenol	16		10	ug/L	50.0	5.6 U	32	10-60			
2,4,6-Tribromophenol	*55*			*ug/L*	*50.0*		*110*	*33-145*			
2-Fluorobiphenyl	*47*			*ug/L*	*50.0*		*94*	*32-116*			

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27017 - EPA 3510C_MS - Continued

Matrix Spike (7J27017-MS1) Continued Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 11:17

Source: AA07548-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Fluorophenol	*22*			*ug/L*	*50.0*		*43*	*11-100*			
Nitrobenzene-d5	*39*			*ug/L*	*50.0*		*78*	*24-107*			
Phenol-d5	*15*			*ug/L*	*50.0*		*30*	*10-100*			
Terphenyl-d14	*46*			*ug/L*	*50.0*		*92*	*52-150*			

Matrix Spike Dup (7J27017-MSD1) Prepared: 10/27/2017 10:56 Analyzed: 10/29/2017 11:48

Source: AA07548-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	19		10	ug/L	50.0	3.3 U	37	10-102	18	18	
1,4-Dichlorobenzene	19		10	ug/L	50.0	3.2 U	37	10-101	25	18	QM-11
2,4-Dinitrotoluene	58		10	ug/L	50.0	3.2 U	115	52-158	4	18	
2-Chlorophenol	30		10	ug/L	50.0	7.4 U	61	17-110	22	16	QM-11
4-Chloro-3-methylphenol	41		10	ug/L	50.0	7.3 U	82	35-131	8	16	
4-Nitrophenol	21		10	ug/L	50.0	7.9 U	43	10-94	2	15	
N-Nitroso-di-n-propylamine	46		10	ug/L	50.0	4.5 U	92	26-135	17	18	
Pentachlorophenol	31		10	ug/L	50.0	8.2 U	62	5-139	4	23	
Phenol	13		10	ug/L	50.0	5.6 U	26	10-60	21	9	QM-11
2,4,6-Tribromophenol	*55*			*ug/L*	*50.0*		*110*	*33-145*			
2-Fluorobiphenyl	*42*			*ug/L*	*50.0*		*85*	*32-116*			
2-Fluorophenol	*17*			*ug/L*	*50.0*		*35*	*11-100*			
Nitrobenzene-d5	*33*			*ug/L*	*50.0*		*66*	*24-107*			
Phenol-d5	*13*			*ug/L*	*50.0*		*26*	*10-100*			
Terphenyl-d14	*48*			*ug/L*	*50.0*		*96*	*52-150*			

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J30041 - EPA 3511_MS

Blank (7J30041-BLK1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 14:56

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1-Methylnaphthalene	0.047	U	0.10	ug/L							
2-Methylnaphthalene	0.044	U	0.10	ug/L							
Acenaphthene	0.037	U	0.10	ug/L							
Acenaphthylene	0.036	U	0.10	ug/L							
Anthracene	0.036	U	0.10	ug/L							
Benzo(a)anthracene	0.037	U	0.10	ug/L							
Benzo(a)pyrene	0.043	U	0.10	ug/L							
Benzo(b)fluoranthene	0.059	U	0.10	ug/L							
Benzo(g,h,i)perylene	0.040	U	0.10	ug/L							
Benzo(k)fluoranthene	0.046	U	0.10	ug/L							
Chrysene	0.051	U	0.10	ug/L							
Dibenzo(a,h)anthracene	0.026	U	0.10	ug/L							
Fluoranthene	0.051	U	0.10	ug/L							
Fluorene	0.038	U	0.10	ug/L							
Indeno(1,2,3-cd)pyrene	0.037	U	0.10	ug/L							
Naphthalene	0.035	U	0.10	ug/L							
Phenanthrene	0.039	U	0.10	ug/L							
Pyrene	0.048	U	0.10	ug/L							

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J30041 - EPA 3511_MS - Continued

Blank (7J30041-BLK1) Continued Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 14:56

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
p-Terphenyl	*5.7*			*ug/L*	*5.71*		*99*	*61-151*			

LCS (7J30041-BS1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 15:45

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	5.6		0.10	ug/L	5.71		97	80-120			
Benzo(a)pyrene	4.9		0.10	ug/L	5.71		86	73-149			
Benzo(g,h,i)perylene	4.2		0.10	ug/L	5.71		73	57-124			
Naphthalene	4.7		0.10	ug/L	5.71		82	68-120			
p-Terphenyl	*6.2*			*ug/L*	*5.71*		*108*	*61-151*			

Matrix Spike (7J30041-MS1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 16:11

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	5.3		0.10	ug/L	5.71	0.037 U	93	80-120			
Benzo(a)pyrene	4.7		0.10	ug/L	5.71	0.043 U	82	73-149			
Benzo(g,h,i)perylene	4.1		0.10	ug/L	5.71	0.040 U	72	57-124			
Naphthalene	4.3		0.10	ug/L	5.71	0.035 U	76	68-120			
p-Terphenyl	*6.2*			*ug/L*	*5.71*		*109*	*61-151*			

Matrix Spike Dup (7J30041-MSD1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 16:37

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	4.8		0.10	ug/L	5.71	0.037 U	84	80-120	10	25	
Benzo(a)pyrene	4.5		0.10	ug/L	5.71	0.043 U	78	73-149	4	25	
Benzo(g,h,i)perylene	3.8		0.10	ug/L	5.71	0.040 U	67	57-124	7	25	
Naphthalene	3.9		0.10	ug/L	5.71	0.035 U	68	68-120	11	25	
p-Terphenyl	*6.4*			*ug/L*	*5.71*		*113*	*61-151*			

Batch 7K02039 - EPA 3511_MS

Blank (7K02039-BLK1) Prepared: 11/02/2017 16:30 Analyzed: 11/03/2017 10:44

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1-Methylnaphthalene	0.047	U	0.10	ug/L							
2-Methylnaphthalene	0.044	U	0.10	ug/L							
Acenaphthene	0.037	U	0.10	ug/L							
Acenaphthylene	0.036	U	0.10	ug/L							
Anthracene	0.036	U	0.10	ug/L							
Benzo(a)anthracene	0.037	U	0.10	ug/L							
Benzo(a)pyrene	0.043	U	0.10	ug/L							
Benzo(b)fluoranthene	0.059	U	0.10	ug/L							
Benzo(g,h,i)perylene	0.040	U	0.10	ug/L							
Benzo(k)fluoranthene	0.046	U	0.10	ug/L							
Chrysene	0.051	U	0.10	ug/L							
Dibenzo(a,h)anthracene	0.026	U	0.10	ug/L							
Fluoranthene	0.051	U	0.10	ug/L							

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7K02039 - EPA 3511_MS - Continued

Blank (7K02039-BLK1) Continued Prepared: 11/02/2017 16:30 Analyzed: 11/03/2017 10:44

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fluorene	0.038	U	0.10	ug/L							
Indeno(1,2,3-cd)pyrene	0.037	U	0.10	ug/L							
Naphthalene	0.035	U	0.10	ug/L							
Phenanthrene	0.039	U	0.10	ug/L							
Pyrene	0.048	U	0.10	ug/L							
p-Terphenyl	*7.0*			*ug/L*	*5.71*		*122*	*61-151*			

LCS (7K02039-BS1) Prepared: 11/02/2017 16:30 Analyzed: 11/03/2017 11:05

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	5.5		0.10	ug/L	5.71		97	80-120			
Benzo(a)pyrene	5.8		0.10	ug/L	5.71		102	73-149			
Benzo(g,h,i)perylene	5.7		0.10	ug/L	5.71		99	57-124			
Naphthalene	5.0		0.10	ug/L	5.71		88	68-120			
p-Terphenyl	*6.1*			*ug/L*	*5.71*		*107*	*61-151*			

Matrix Spike (7K02039-MS1) Prepared: 11/02/2017 16:30 Analyzed: 11/03/2017 11:27

Source: AA07711-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	5.8		0.10	ug/L	5.71	0.037 U	101	80-120			
Benzo(a)pyrene	6.5		0.10	ug/L	5.71	0.043 U	114	73-149			
Benzo(g,h,i)perylene	6.4		0.10	ug/L	5.71	0.046	111	57-124			
Naphthalene	4.7		0.10	ug/L	5.71	0.035 U	82	68-120			
p-Terphenyl	*7.3*			*ug/L*	*5.71*		*128*	*61-151*			

Matrix Spike Dup (7K02039-MSD1) Prepared: 11/02/2017 16:30 Analyzed: 11/03/2017 11:49

Source: AA07711-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	5.6		0.10	ug/L	5.71	0.037 U	97	80-120	4	25	
Benzo(a)pyrene	6.1		0.10	ug/L	5.71	0.043 U	108	73-149	6	25	
Benzo(g,h,i)perylene	5.6		0.10	ug/L	5.71	0.046	97	57-124	13	25	
Naphthalene	4.4		0.10	ug/L	5.71	0.035 U	77	68-120	6	25	
p-Terphenyl	*7.0*			*ug/L*	*5.71*		*123*	*61-151*			

Organochlorine Pesticides by GC - Quality Control

Batch 7J30039 - EPA 3510C

Blank (7J30039-BLK1) Prepared: 10/30/2017 14:00 Analyzed: 10/31/2017 08:49

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDD	0.018	U	0.050	ug/L							
4,4'-DDE	0.036	U	0.050	ug/L							
4,4'-DDT	0.025	U	0.050	ug/L							
Aldrin	0.032	U	0.050	ug/L							
alpha-BHC	0.026	U	0.050	ug/L							
beta-BHC	0.022	U	0.050	ug/L							

QUALITY CONTROL DATA

Organochlorine Pesticides by GC - Quality Control

Batch 7J30039 - EPA 3510C - Continued

Blank (7J30039-BLK1) Continued Prepared: 10/30/2017 14:00 Analyzed: 10/31/2017 08:49

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chlordane (tech)	0.36	U	0.50	ug/L							
Chlordane-alpha	0.022	U	0.050	ug/L							
Chlordane-gamma	0.018	U	0.050	ug/L							
delta-BHC	0.019	U	0.050	ug/L							
Dieldrin	0.017	U	0.050	ug/L							
Endosulfan I	0.016	U	0.050	ug/L							
Endosulfan II	0.017	U	0.050	ug/L							
Endosulfan sulfate	0.016	U	0.050	ug/L							
Endrin	0.014	U	0.050	ug/L							
Endrin aldehyde	0.020	U	0.050	ug/L							
Endrin ketone	0.017	U	0.050	ug/L							
gamma-BHC	0.020	U	0.050	ug/L							
Heptachlor	0.018	U	0.050	ug/L							
Heptachlor epoxide	0.018	U	0.050	ug/L							
Isodrin	0.030	U	0.050	ug/L							
Methoxychlor	0.020	U	0.050	ug/L							
Mirex	0.034	U	0.050	ug/L							
Toxaphene	0.48	U	0.50	ug/L							
2,4,5,6-TCMX	*0.75*			*ug/L*	*1.00*		*75*	*38-142*			
Decachlorobiphenyl	*0.90*			*ug/L*	*1.00*		*90*	*34-159*			

LCS (7J30039-BS1) Prepared: 10/30/2017 14:00 Analyzed: 10/31/2017 09:14

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDT	1.5		0.050	ug/L	1.00		149	37-125			QL-02
Dieldrin	1.0		0.050	ug/L	1.00		105	46-127			
Endrin	1.1		0.050	ug/L	1.00		114	28-143			
2,4,5,6-TCMX	*0.85*			*ug/L*	*1.00*		*85*	*38-142*			
Decachlorobiphenyl	*0.99*			*ug/L*	*1.00*		*99*	*34-159*			

Matrix Spike (7J30039-MS1) Prepared: 10/30/2017 14:00 Analyzed: 10/31/2017 09:27

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDT	1.0		0.050	ug/L	1.00	0.025 U	103	37-125			
Dieldrin	0.76		0.050	ug/L	1.00	0.017 U	76	46-127			
Endrin	0.80		0.050	ug/L	1.00	0.014 U	80	28-143			
2,4,5,6-TCMX	*0.57*			*ug/L*	*1.00*		*57*	*38-142*			
Decachlorobiphenyl	*0.69*			*ug/L*	*1.00*		*69*	*34-159*			

Matrix Spike Dup (7J30039-MSD1) Prepared: 10/30/2017 14:00 Analyzed: 10/31/2017 09:39

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDT	0.98		0.050	ug/L	1.00	0.025 U	98	37-125	5	24	
Dieldrin	0.69		0.050	ug/L	1.00	0.017 U	69	46-127	10	21	
Endrin	0.72		0.050	ug/L	1.00	0.014 U	72	28-143	11	22	
2,4,5,6-TCMX	*0.69*			*ug/L*	*1.00*		*69*	*38-142*			
Decachlorobiphenyl	*0.39*			*ug/L*	*1.00*		*39*	*34-159*			

QUALITY CONTROL DATA

Polychlorinated Biphenyls by GC - Quality Control

Batch 7K01019 - EPA 3510C

Blank (7K01019-BLK1) Prepared: 11/01/2017 13:43 Analyzed: 11/01/2017 17:40

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	0.49	U	0.50	ug/L							
PCB-1221	0.46	U	0.50	ug/L							
PCB-1232	0.47	U	0.50	ug/L							
PCB-1248	0.49	U	0.50	ug/L							
PCB-1254	0.50	U	0.50	ug/L							
PCB-1260	0.48	U	0.50	ug/L							
2,4,5,6-TCMX	*0.35*			*ug/L*	*1.00*		*35*	*38-142*			
Decachlorobiphenyl	*0.64*			*ug/L*	*1.00*		*64*	*34-159*			

LCS (7K01019-BS1) Prepared: 11/01/2017 13:43 Analyzed: 11/01/2017 17:52

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	9.8		0.50	ug/L	10.0		98	11-162			
PCB-1260	8.3		0.50	ug/L	10.0		83	10-166			
2,4,5,6-TCMX	*0.84*			*ug/L*	*1.00*		*84*	*38-142*			
Decachlorobiphenyl	*0.76*			*ug/L*	*1.00*		*76*	*34-159*			

Matrix Spike (7K01019-MS1) Prepared: 11/01/2017 13:43 Analyzed: 11/01/2017 18:04

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	10		0.50	ug/L	10.0	0.49 U	101	11-162			
PCB-1260	8.9		0.50	ug/L	10.0	0.48 U	89	10-166			
2,4,5,6-TCMX	*0.81*			*ug/L*	*1.00*		*81*	*38-142*			
Decachlorobiphenyl	*0.75*			*ug/L*	*1.00*		*75*	*34-159*			

Matrix Spike Dup (7K01019-MSD1) Prepared: 11/01/2017 13:43 Analyzed: 11/01/2017 18:15

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	8.3		0.50	ug/L	10.0	0.49 U	83	11-162	19	23	
PCB-1260	7.1		0.50	ug/L	10.0	0.48 U	71	10-166	23	13	QM-11
2,4,5,6-TCMX	*0.76*			*ug/L*	*1.00*		*76*	*38-142*			
Decachlorobiphenyl	*0.71*			*ug/L*	*1.00*		*71*	*34-159*			

FL Petroleum Range Organics - Quality Control

Batch 7J30053 - EPA 3510C

Blank (7J30053-BLK1) Prepared: 10/30/2017 17:19 Analyzed: 10/31/2017 23:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	100	U	680	ug/L							
n-Nonatriacontane	*440*			*ug/L*	*400*		*109*	*42-193*			
o-Terphenyl	*240*			*ug/L*	*201*		*119*	*82-142*			

LCS (7J30053-BS1) Prepared: 10/30/2017 17:19 Analyzed: 11/01/2017 00:27

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

QUALITY CONTROL DATA

FL Petroleum Range Organics - Quality Control

Batch 7J30053 - EPA 3510C - Continued

LCS (7J30053-BS1) Continued Prepared: 10/30/2017 17:19 Analyzed: 11/01/2017 00:27

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	7000		680	ug/L	6800		103	55-118			
n-Nonatriacontane	*380*			*ug/L*	*400*		*94*	*42-193*			
o-Terphenyl	*230*			*ug/L*	*201*		*113*	*82-142*			

Matrix Spike (7J30053-MS1) Prepared: 10/30/2017 17:19 Analyzed: 11/01/2017 01:00

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	7400		680	ug/L	6800	100 U	109	41-101			QM-07
n-Nonatriacontane	*420*			*ug/L*	*400*		*106*	*42-193*			
o-Terphenyl	*240*			*ug/L*	*201*		*120*	*82-142*			

Matrix Spike Dup (7J30053-MSD1) Prepared: 10/30/2017 17:19 Analyzed: 11/01/2017 01:34

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	6900		680	ug/L	6800	100 U	102	41-101	7	20	QM-07
n-Nonatriacontane	*310*			*ug/L*	*400*		*78*	*42-193*			
o-Terphenyl	*230*			*ug/L*	*201*		*116*	*82-142*			

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 7J30018 - EPA 7470A

Blank (7J30018-BLK1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 09:03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.0230	U	0.200	ug/L							

LCS (7J30018-BS1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 09:06

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	5.08		0.200	ug/L	5.00		102	80-120			

Matrix Spike (7J30018-MS1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 09:16

Source: AA07481-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	5.33		0.200	ug/L	5.00	0.0230 U	107	75-125			

Matrix Spike Dup (7J30018-MSD1) Prepared: 10/30/2017 13:36 Analyzed: 10/31/2017 09:19

Source: AA07481-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	5.29		0.200	ug/L	5.00	0.0230 U	106	75-125	0.8	20	

Post Spike (7J30018-PS1) Prepared: 10/31/2017 06:00 Analyzed: 10/31/2017 09:22

Source: AA07481-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	5.25		0.200	ug/L	5.61	-0.0115	94	80-120			

QUALITY CONTROL DATA

Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control

Batch 7J30001 - EPA 3005A

Blank (7J30001-BLK1) Prepared: 10/30/2017 09:04 Analyzed: 10/31/2017 10:18

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	8.00	U	10.0	ug/L							
Barium	2.00	U	10.0	ug/L							
Cadmium	0.450	U	1.00	ug/L							
Chromium	1.10	U	10.0	ug/L							
Lead	3.80	U	10.0	ug/L							
Selenium	10.0	U	40.0	ug/L							
Silver	0.740	U	10.0	ug/L							

LCS (7J30001-BS1) Prepared: 10/30/2017 09:04 Analyzed: 10/31/2017 10:20

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	488		10.0	ug/L	500		98	80-120			
Barium	512		10.0	ug/L	500		102	80-120			
Cadmium	51.3		1.00	ug/L	50.0		103	80-120			
Chromium	504		10.0	ug/L	500		101	80-120			
Lead	508		10.0	ug/L	500		102	80-120			
Selenium	514		40.0	ug/L	500		103	80-120			
Silver	103		10.0	ug/L	100		103	80-120			

Matrix Spike (7J30001-MS1) Prepared: 10/30/2017 09:04 Analyzed: 10/31/2017 10:21

Source: BA04585-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	501		10.0	ug/L	500	8.00 U	100	75-125			
Barium	522		10.0	ug/L	500	12.2	102	75-125			
Cadmium	51.1		1.00	ug/L	50.0	0.450 U	102	75-125			
Chromium	511		10.0	ug/L	500	4.14	101	75-125			
Lead	507		10.0	ug/L	500	6.32	100	75-125			
Selenium	498		40.0	ug/L	500	10.0 U	100	75-125			
Silver	103		10.0	ug/L	100	0.740 U	103	75-125			

Matrix Spike Dup (7J30001-MSD1) Prepared: 10/30/2017 09:04 Analyzed: 10/31/2017 10:23

Source: BA04585-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	512		10.0	ug/L	500	8.00 U	102	75-125	2	20	
Barium	529		10.0	ug/L	500	12.2	103	75-125	1	20	
Cadmium	51.9		1.00	ug/L	50.0	0.450 U	104	75-125	2	20	
Chromium	518		10.0	ug/L	500	4.14	103	75-125	1	20	
Lead	518		10.0	ug/L	500	6.32	102	75-125	2	20	
Selenium	506		40.0	ug/L	500	10.0 U	101	75-125	2	20	
Silver	104		10.0	ug/L	100	0.740 U	104	75-125	2	20	

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*	Not reported due to interference.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate (CLP E-flag).
J-06	The associated laboratory control sample exhibited low bias; the reported result should be considered to be a minimum estimate.
QI-03	The internal standard(s) for this sample were outside the acceptance limits due to sample matrix interference. The sample was reanalyzed at a dilution.
QL-02	The associated laboratory control sample exhibited high bias; since the result is ND, there is no impact.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-11	Precision between duplicate matrix spikes of the same sample was outside acceptance limits.
QM-17	Matrix spike recovery was outside acceptance limits due to high concentrations of analyte in source sample.
QS-03	Surrogate recovery outside acceptance limits
QS-05	Surrogate recovery biased low and outside control limits due to suspected matrix effects, as evidenced by sample behavior during sample preparation (emulsion formation, excessive foaming).
QS-06	Surrogate recovery exceeded acceptance criteria due to the presence of a coeluting compound. This is a confirmed matrix effect.
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

ENVIRONMENTAL CONSERVATION LABORATORIES

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
Jacksonville, FL 32216-6069
(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

CHAIN-OF-CUSTODY RECORD

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Page 1 of 1

Client Name: PSI - Tampa (PS003)	Project Number: 05522421
Address: 5801 Benjamin Center Drive Suite 112	Project Name/Desc: Manatee County - Port Manatee
City/ST/Zip: Tampa, FL 33634	PO # / Billing Info: 05522421
Tel: (813) 886-1075 Fax: (813) 888-6514	Reporting Contact: Sean Barnes
Sampler(s) Name, Affiliation (Print): Sean Barnes PSI	Billing Contact: Sean Barnes
Sampler(s) Signature:	Site Location / Time Zone

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

___ Standard

___ Expedited

Due ___/___/___

Lab Workorder: AA07481

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	8260B Arom	8270D PAH SIM	8270D Full List	8082A PCBs	8081B Pests	RCRA8 Metals (Ag,As,Ba,Cd,Cr,Pb,Se,Hg)	FLPRO	Sample Comments
1	SB-1	10-25-17	11:32	Grab	GW	10	X	X	X	X	X	X	X	
2	SB-2		12:48			10								
3	SB-3		15:46			10								
4	SB-4		17:15			10								
5	SB-5		17:53			10								
6														
7														
8														
9														
10														
11														
12														

Preservation (See Codes) (Combine as necessary)

<-- Total # of Containers

Sample Kit Prepared By: EC6	Date/Time: 10/19/17 14:30	Relinquished By:	Date/Time: 10/19/17 14:30	Received By:	Date/Time: 10/20/17 9:00
Comments/Special Reporting Requirements:		Relinquished By:	Date/Time: 10/20/17 17:00	Received By:	Date/Time: 10/20/17 1700
		Relinquished By:	Date/Time: 10/24/17 1430	Received By:	Date/Time:

Cooler #'s & Temps on Receipt: L6-355 0.4C°, C-381 0.3C° L6-418 0.4C° L6-382 1.6C°

Condition Upon Receipt: Acceptable ___ Unacceptable

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Monday, November 6, 2017
PSI - Tampa (PS003)
Attn: Sean Barnes
5801 Benjamin Center Drive Suite 112
Tampa, FL 33634

RE: Laboratory Results for
Project Number: 05522421, Project Name/Desc: Manatee County - Port Manatee
ENCO Workorder(s): AA07699

Dear Sean Barnes,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, October 27, 2017.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

David Camacho For Cassie B. Puryear

Project Manager

Enclosure(s)

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: SB-1 (2-4') **Lab ID: AA07699-01** **Sampled: 10/25/17 11:16** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:19
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 08:40
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 09:06
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 09:25
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 14:49
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	10/30/17 18:00
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/30/17 22:42
FL-PRO	EPA 3550C	11/08/17	12/09/17	10/30/17	10:30	11/02/17 02:31

Client ID: SB-1 (4-6') **Lab ID: AA07699-02** **Sampled: 10/25/17 12:00** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:21
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 08:53
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 09:18
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 09:37
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 15:18
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	10/30/17 18:31
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/30/17 23:04
FL-PRO	EPA 3550C	11/08/17	12/09/17	10/30/17	10:30	11/02/17 03:03

Client ID: SB-1 (6-8') **Lab ID: AA07699-03** **Sampled: 10/25/17 12:15** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:22
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 08:57
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 09:32
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 09:49
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 15:47
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	10/30/17 19:01
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/30/17 23:26

Client ID: SB-1 (6-8') **Lab ID: AA07699-03RE2** **Sampled: 10/25/17 12:15** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/01/17	12/12/17	11/02/17	13:20	11/06/17 14:43

Client ID: SB-2 (4-6') **Lab ID: AA07699-04** **Sampled: 10/25/17 12:25** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:24
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:10
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 09:44
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 10:01
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 16:15
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	10/30/17 22:34
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/30/17 23:48

Client ID: SB-2 (4-6') **Lab ID: AA07699-04RE1** **Sampled: 10/25/17 12:25** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/01/17	12/12/17	11/02/17	13:20	11/03/17 10:54

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: SB-2 (6-8') **Lab ID: AA07699-05** **Sampled: 10/25/17 12:36** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:25
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:13
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 09:56
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 11:04
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 16:44
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	10/30/17 19:31
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/31/17 00:10

Client ID: SB-2 (6-8') **Lab ID: AA07699-05RE1** **Sampled: 10/25/17 12:36** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/01/17	12/12/17	11/02/17	13:20	11/03/17 11:27

Client ID: SB-3 (2-4') **Lab ID: AA07699-06** **Sampled: 10/25/17 15:20** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:27
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:17
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 10:09
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 11:16
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 17:13
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	11/01/17 17:17
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/31/17 00:32

Client ID: SB-3 (2-4') **Lab ID: AA07699-06RE1** **Sampled: 10/25/17 15:20** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/01/17	12/12/17	11/02/17	13:20	11/03/17 12:00

Client ID: SB-3 (6-8') **Lab ID: AA07699-07** **Sampled: 10/25/17 15:32** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:28
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:21
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 10:21
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 11:28
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 17:41
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	11/01/17 15:45
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/31/17 00:54
FL-PRO	EPA 3550C	11/08/17	12/09/17	10/30/17	10:30	11/02/17 06:10

Client ID: SB-4 (2-4') **Lab ID: AA07699-08** **Sampled: 10/25/17 16:50** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:30
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:27
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 10:34
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 11:39
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 18:10
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	11/01/17 17:47
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/31/17 01:16

Client ID: SB-4 (2-4') **Lab ID: AA07699-08RE1** **Sampled: 10/25/17 16:50** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/01/17	12/12/17	11/02/17	13:20	11/03/17 13:40

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: SB-4 (6-8') **Lab ID: AA07699-09** **Sampled: 10/25/17 17:00** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:31
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:31
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 10:46
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 11:51
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 18:38
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	11/01/17 16:16
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	10/31/17 01:38
FL-PRO	EPA 3550C	11/08/17	12/09/17	10/30/17	10:30	11/02/17 07:13

Client ID: SB-5 (0-2') **Lab ID: AA07699-10** **Sampled: 10/25/17 17:38** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:33
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:34
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 10:58
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 12:03
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 19:07
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	11/01/17 18:18
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	11/01/17 23:10
FL-PRO	EPA 3550C	11/08/17	12/09/17	10/30/17	10:30	11/03/17 21:27

Client ID: SB-5 (0-2') **Lab ID: AA07699-10RE1** **Sampled: 10/25/17 17:38** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 22:45

Client ID: SB-5 (6-8') **Lab ID: AA07699-11** **Sampled: 10/25/17 17:44** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/23/18		10/31/17	09:18	11/01/17 11:38
EPA 7471B	EPA 7471B	11/22/17		11/01/17	11:15	11/02/17 09:38
EPA 8081B	EPA 3550C	11/08/17	12/10/17	10/31/17	10:32	11/01/17 11:11
EPA 8082A	EPA 3550C	10/25/18	10/25/18	10/31/17	12:06	11/01/17 12:15
EPA 8260B	EPA 5035_MS	11/08/17		11/02/17	00:00	11/02/17 19:36
EPA 8270D	EPA 3550C_MS	11/08/17	12/06/17	10/27/17	11:50	11/01/17 16:46
EPA 8270D	SOP EXSV-33	11/08/17	12/07/17	10/28/17	12:35	11/01/17 23:32
FL-PRO	EPA 3550C	11/08/17	12/09/17	10/30/17	10:30	11/03/17 22:01

Client ID: TRIP BLANK **Lab ID: AA07699-12** **Sampled: 10/26/17 00:00** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8260B	EPA 5030B_MS	11/09/17	11/02/17	00:00	11/02/17 11:42

Client ID: TRIP BLANK **Lab ID: AA07699-13** **Sampled: 10/26/17 00:00** **Received: 10/27/17 08:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8260B	EPA 5030B_MS	11/09/17	11/02/17	00:00	11/02/17 12:11

SAMPLE DETECTION SUMMARY

Client ID: SB-1 (2-4') **Lab ID: AA07699-01**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	2.57		0.511	0.595	mg/kg dry	EPA 6010C	
Barium - Total	10.5		0.0523	0.595	mg/kg dry	EPA 6010C	
Cadmium - Total	0.254		0.0274	0.0595	mg/kg dry	EPA 6010C	
Chromium - Total	14.6		0.190	0.595	mg/kg dry	EPA 6010C	
Mercury - Total	0.0119		0.00464	0.0119	mg/kg dry	EPA 7471B	
Selenium - Total	4.70		0.690	2.38	mg/kg dry	EPA 6010C	

Client ID: SB-1 (4-6') **Lab ID: AA07699-02**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	3.38		0.617	0.717	mg/kg dry	EPA 6010C	
Barium - Total	9.79		0.0631	0.717	mg/kg dry	EPA 6010C	
Cadmium - Total	0.261		0.0330	0.0717	mg/kg dry	EPA 6010C	
Chromium - Total	17.2		0.229	0.717	mg/kg dry	EPA 6010C	
Ethylbenzene	0.0039		0.00055	0.00095	mg/kg dry	EPA 8260B	
m,p-Xylenes	0.0020		0.0010	0.0019	mg/kg dry	EPA 8260B	
Mercury - Total	0.0107	I	0.00492	0.0126	mg/kg dry	EPA 7471B	
Naphthalene	0.040	I	0.023	0.044	mg/kg dry	EPA 8270D	
Selenium - Total	3.98		0.832	2.87	mg/kg dry	EPA 6010C	
Xylenes (Total)	0.0020		0.00094	0.0019	mg/kg dry	EPA 8260B	

Client ID: SB-1 (6-8') **Lab ID: AA07699-03**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1-Methylnaphthalene	2.7		0.023	0.043	mg/kg dry	EPA 8270D	
2-Methylnaphthalene	4.3		0.022	0.043	mg/kg dry	EPA 8270D	
Acenaphthene	0.38		0.018	0.043	mg/kg dry	EPA 8270D	
Arsenic - Total	0.887		0.524	0.610	mg/kg dry	EPA 6010C	
Barium - Total	6.03		0.0536	0.610	mg/kg dry	EPA 6010C	
Benzene	0.0021		0.00036	0.00090	mg/kg dry	EPA 8260B	
Benzo(a)anthracene	0.040	I	0.017	0.043	mg/kg dry	EPA 8270D	
Cadmium - Total	0.0630		0.0280	0.0610	mg/kg dry	EPA 6010C	
Chromium - Total	3.06		0.195	0.610	mg/kg dry	EPA 6010C	
Chrysene	0.017	I	0.015	0.043	mg/kg dry	EPA 8270D	
Ethylbenzene	0.097		0.00052	0.00090	mg/kg dry	EPA 8260B	
Fluoranthene	0.052		0.021	0.043	mg/kg dry	EPA 8270D	
Fluorene	0.77		0.021	0.043	mg/kg dry	EPA 8270D	
Lead - Total	0.478	I	0.280	0.610	mg/kg dry	EPA 6010C	
m,p-Xylenes	0.079		0.00099	0.0018	mg/kg dry	EPA 8260B	
Mercury - Total	0.00801	I	0.00475	0.0122	mg/kg dry	EPA 7471B	
Naphthalene	0.79		0.022	0.043	mg/kg dry	EPA 8270D	
o-Xylene	0.0052		0.00051	0.00090	mg/kg dry	EPA 8260B	
Phenanthrene	1.7		0.018	0.043	mg/kg dry	EPA 8270D	
Pyrene	0.33		0.020	0.043	mg/kg dry	EPA 8270D	
Xylenes (Total)	0.085		0.00090	0.0018	mg/kg dry	EPA 8260B	

Client ID: SB-1 (6-8') **Lab ID: AA07699-03RE2**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
TPH (C8-C40)	400		21	35	mg/kg dry	FL-PRO	

Client ID: SB-2 (4-6') **Lab ID: AA07699-04**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	9.69		0.749	0.871	mg/kg dry	EPA 6010C	
Barium - Total	9.98		0.0766	0.871	mg/kg dry	EPA 6010C	
Cadmium - Total	0.216		0.0401	0.0871	mg/kg dry	EPA 6010C	
Chromium - Total	31.7		0.279	0.871	mg/kg dry	EPA 6010C	
Mercury - Total	0.0114	I	0.00489	0.0125	mg/kg dry	EPA 7471B	
Selenium - Total	4.63		1.01	3.48	mg/kg dry	EPA 6010C	

SAMPLE DETECTION SUMMARY

Client ID: SB-2 (6-8') **Lab ID: AA07699-05**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1-Methylnaphthalene	0.037	I	0.023	0.043	mg/kg dry	EPA 8270D	
Arsenic - Total	2.11		0.632	0.735	mg/kg dry	EPA 6010C	
Barium - Total	4.84		0.0647	0.735	mg/kg dry	EPA 6010C	
Cadmium - Total	0.0704	I	0.0338	0.0735	mg/kg dry	EPA 6010C	
Chromium - Total	6.00		0.235	0.735	mg/kg dry	EPA 6010C	
Lead - Total	0.812		0.338	0.735	mg/kg dry	EPA 6010C	

Client ID: SB-3 (2-4') **Lab ID: AA07699-06**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	5.36		0.703	0.817	mg/kg dry	EPA 6010C	
Barium - Total	13.7		0.0719	0.817	mg/kg dry	EPA 6010C	
Cadmium - Total	0.254		0.0376	0.0817	mg/kg dry	EPA 6010C	
Chromium - Total	26.7		0.261	0.817	mg/kg dry	EPA 6010C	
Mercury - Total	0.0124		0.00459	0.0118	mg/kg dry	EPA 7471B	
Selenium - Total	4.96		0.948	3.27	mg/kg dry	EPA 6010C	

Client ID: SB-3 (6-8') **Lab ID: AA07699-07**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	2.44		0.527	0.612	mg/kg dry	EPA 6010C	
Barium - Total	7.56		0.0539	0.612	mg/kg dry	EPA 6010C	
Cadmium - Total	0.201		0.0282	0.0612	mg/kg dry	EPA 6010C	
Chromium - Total	11.8		0.196	0.612	mg/kg dry	EPA 6010C	
Mercury - Total	0.00983	I	0.00478	0.0122	mg/kg dry	EPA 7471B	
Selenium - Total	3.85		0.710	2.45	mg/kg dry	EPA 6010C	
Silver - Total	0.0830	I	0.0600	0.612	mg/kg dry	EPA 6010C	

Client ID: SB-4 (2-4') **Lab ID: AA07699-08**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
2-Methylnaphthalene	0.028	I	0.022	0.043	mg/kg dry	EPA 8270D	
Arsenic - Total	7.26		0.731	0.849	mg/kg dry	EPA 6010C	
Barium - Total	15.8		0.0748	0.849	mg/kg dry	EPA 6010C	
Benzo(a)anthracene	0.045		0.017	0.043	mg/kg dry	EPA 8270D	
Benzo(b)fluoranthene	0.025	I	0.021	0.043	mg/kg dry	EPA 8270D	
Cadmium - Total	0.403		0.0391	0.0849	mg/kg dry	EPA 6010C	
Chromium - Total	28.2		0.272	0.849	mg/kg dry	EPA 6010C	
Chrysene	0.023	I	0.015	0.043	mg/kg dry	EPA 8270D	
Fluoranthene	0.048		0.021	0.043	mg/kg dry	EPA 8270D	
Mercury - Total	0.0119	I	0.00484	0.0124	mg/kg dry	EPA 7471B	
Phenanthrene	0.080		0.019	0.043	mg/kg dry	EPA 8270D	
Pyrene	0.045		0.020	0.043	mg/kg dry	EPA 8270D	
Selenium - Total	2.96	I	0.985	3.40	mg/kg dry	EPA 6010C	

Client ID: SB-4 (2-4') **Lab ID: AA07699-08RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
TPH (C8-C40)	50		4.2	7.1	mg/kg dry	FL-PRO	

Client ID: SB-4 (6-8') **Lab ID: AA07699-09**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	3.70		0.607	0.706	mg/kg dry	EPA 6010C	
Barium - Total	9.96		0.0621	0.706	mg/kg dry	EPA 6010C	
Cadmium - Total	0.224		0.0325	0.0706	mg/kg dry	EPA 6010C	
Chromium - Total	17.9		0.226	0.706	mg/kg dry	EPA 6010C	
Lead - Total	0.649	I	0.325	0.706	mg/kg dry	EPA 6010C	
Mercury - Total	0.0138	I	0.00551	0.0141	mg/kg dry	EPA 7471B	
Selenium - Total	2.89		0.819	2.82	mg/kg dry	EPA 6010C	

SAMPLE DETECTION SUMMARY

Client ID: SB-5 (0-2') **Lab ID: AA07699-10**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1-Methylnaphthalene	0.025	I	0.021	0.039	mg/kg dry	EPA 8270D	
2-Methylnaphthalene	0.029	I	0.020	0.039	mg/kg dry	EPA 8270D	
Arsenic - Total	3.34		0.657	0.764	mg/kg dry	EPA 6010C	
Barium - Total	17.0		0.0673	0.764	mg/kg dry	EPA 6010C	
Benzo(a)anthracene	0.061		0.016	0.039	mg/kg dry	EPA 8270D	
Benzo(a)pyrene	0.067		0.017	0.039	mg/kg dry	EPA 8270D	
Benzo(b)fluoranthene	0.11		0.019	0.039	mg/kg dry	EPA 8270D	
Benzo(g,h,i)perylene	0.058		0.017	0.039	mg/kg dry	EPA 8270D	
Benzo(k)fluoranthene	0.040		0.021	0.039	mg/kg dry	EPA 8270D	
Cadmium - Total	0.385		0.0352	0.0764	mg/kg dry	EPA 6010C	
Chromium - Total	14.6		0.245	0.764	mg/kg dry	EPA 6010C	
Chrysene	0.10		0.013	0.039	mg/kg dry	EPA 8270D	
Fluoranthene	0.17		0.019	0.039	mg/kg dry	EPA 8270D	
Indeno(1,2,3-cd)pyrene	0.043		0.017	0.039	mg/kg dry	EPA 8270D	
Lead - Total	13.7		0.352	0.764	mg/kg dry	EPA 6010C	
Mercury - Total	0.0483		0.00396	0.0101	mg/kg dry	EPA 7471B	
PCB-1260	0.096		0.012	0.019	mg/kg dry	EPA 8082A	
Phenanthrene	0.10		0.017	0.039	mg/kg dry	EPA 8270D	
Pyrene	0.14		0.018	0.039	mg/kg dry	EPA 8270D	
Selenium - Total	3.52		0.887	3.06	mg/kg dry	EPA 6010C	
TPH (C8-C40)	120		3.8	6.4	mg/kg dry	FL-PRO	

Client ID: SB-5 (0-2') **Lab ID: AA07699-10RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
PCB-1254	0.15		0.018	0.019	mg/kg dry	EPA 8082A	

Client ID: SB-5 (6-8') **Lab ID: AA07699-11**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	4.93		0.815	0.948	mg/kg dry	EPA 6010C	
Barium - Total	13.7		0.0834	0.948	mg/kg dry	EPA 6010C	
Cadmium - Total	0.286		0.0436	0.0948	mg/kg dry	EPA 6010C	
Chromium - Total	18.1		0.303	0.948	mg/kg dry	EPA 6010C	
Lead - Total	0.808	I	0.436	0.948	mg/kg dry	EPA 6010C	
Mercury - Total	0.0229		0.00510	0.0131	mg/kg dry	EPA 7471B	
Selenium - Total	6.71		1.10	3.79	mg/kg dry	EPA 6010C	
Silver - Total	0.109	I	0.0929	0.948	mg/kg dry	EPA 6010C	
Toluene	0.0023		0.00039	0.00082	mg/kg dry	EPA 8260B	
TPH (C8-C40)	85		4.4	7.5	mg/kg dry	FL-PRO	

ANALYTICAL RESULTS

Description: SB-1 (2-4') **Lab Sample ID:** AA07699-01 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 11:16 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 84.08

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00048	U	mg/kg dry	1	0.00048	0.0012	7K02019	EPA 8260B	11/02/17 14:49	KKW	
Ethylbenzene [100-41-4]^	0.00069	U	mg/kg dry	1	0.00069	0.0012	7K02019	EPA 8260B	11/02/17 14:49	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0013	U	mg/kg dry	1	0.0013	0.0024	7K02019	EPA 8260B	11/02/17 14:49	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00075	U	mg/kg dry	1	0.00075	0.0012	7K02019	EPA 8260B	11/02/17 14:49	KKW	
o-Xylene [95-47-6]^	0.00067	U	mg/kg dry	1	0.00067	0.0012	7K02019	EPA 8260B	11/02/17 14:49	KKW	
Toluene [108-88-3]^	0.00056	U	mg/kg dry	1	0.00056	0.0012	7K02019	EPA 8260B	11/02/17 14:49	KKW	
Xylenes (Total) [1330-20-7]^	0.0012	U	mg/kg dry	1	0.0012	0.0024	7K02019	EPA 8260B	11/02/17 14:49	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.059*	*1*	*0.0565*	*104 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 14:49*	*KKW*	
Dibromofluoromethane	*0.054*	*1*	*0.0565*	*96 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 14:49*	*KKW*	
Toluene-d8	*0.057*	*1*	*0.0565*	*101 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 14:49*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.13	U	mg/kg dry	1	0.13	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.079	U	mg/kg dry	1	0.079	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2,4-Dichlorophenol [120-83-2]^	0.30	U	mg/kg dry	1	0.30	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2,4-Dimethylphenol [105-67-9]^	0.27	U	mg/kg dry	1	0.27	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2,4-Dinitrophenol [51-28-5]^	0.11	U	mg/kg dry	1	0.11	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.19	U	mg/kg dry	1	0.19	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.21	U	mg/kg dry	1	0.21	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2-Chloronaphthalene [91-58-7]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2-Chlorophenol [95-57-8]^	0.27	U	mg/kg dry	1	0.27	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.33	U	mg/kg dry	1	0.33	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	QV-01
2-Methylphenol [95-48-7]^	0.13	U	mg/kg dry	1	0.13	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2-Nitroaniline [88-74-4]^	0.10	U	mg/kg dry	1	0.10	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
2-Nitrophenol [88-75-5]^	0.31	U	mg/kg dry	1	0.31	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.30	U	mg/kg dry	1	0.30	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.25	U	mg/kg dry	1	0.25	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	QV-01
3-Nitroaniline [99-09-2]^	0.095	U	mg/kg dry	1	0.095	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.33	U	mg/kg dry	1	0.33	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
4-Chloroaniline [106-47-8]^	0.077	U	mg/kg dry	1	0.077	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
4-Nitroaniline [100-01-6]^	0.31	U	mg/kg dry	1	0.31	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
4-Nitrophenol [100-02-7]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Benzidine [92-87-5]^	0.10	U	mg/kg dry	1	0.10	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	QV-01
Benzoic acid [65-85-0]^	0.57	U	mg/kg dry	1	0.57	2.0	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Benzyl alcohol [100-51-6]^	0.19	U	mg/kg dry	1	0.19	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.17	U	mg/kg dry	1	0.17	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	

ANALYTICAL RESULTS

Description: SB-1 (2-4') **Lab Sample ID:** AA07699-01 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 11:16 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 84.08

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Butylbenzylphthalate [85-68-7]^	0.17	U	mg/kg dry	1	0.17	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Dibenzofuran [132-64-9]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Diethylphthalate [84-66-2]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Dimethylphthalate [131-11-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Di-n-butylphthalate [84-74-2]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Di-n-octylphthalate [117-84-0]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Hexachlorobenzene [118-74-1]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Hexachlorobutadiene [87-68-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	J-05
Hexachloroethane [67-72-1]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Isophorone [78-59-1]^	0.20	U	mg/kg dry	1	0.20	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Nitrobenzene [98-95-3]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.27	U	mg/kg dry	1	0.27	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Pentachlorophenol [87-86-5]^	0.25	U	mg/kg dry	1	0.25	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Phenol [108-95-2]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	
Pyridine [110-86-1]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	10/30/17 18:00	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*1.6*	*1*	*1.95*	*81 %*	*30-140*	*7J27021*	*EPA 8270D*	*10/30/17 18:00*	*jfi*	
2-Fluorobiphenyl	*1.5*	*1*	*1.95*	*78 %*	*55-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:00*	*jfi*	
2-Fluorophenol	*1.0*	*1*	*1.95*	*52 %*	*38-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:00*	*jfi*	
Nitrobenzene-d5	*1.0*	*1*	*1.95*	*53 %*	*45-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:00*	*jfi*	
Phenol-d5	*1.1*	*1*	*1.95*	*59 %*	*31-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:00*	*jfi*	
Terphenyl-d14	*2.1*	*1*	*1.95*	*106 %*	*41-174*	*7J27021*	*EPA 8270D*	*10/30/17 18:00*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.023	U	mg/kg dry	1	0.023	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
2-Methylnaphthalene [91-57-6]^	0.021	U	mg/kg dry	1	0.021	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Acenaphthene [83-32-9]^	0.018	U	mg/kg dry	1	0.018	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Acenaphthylene [208-96-8]^	0.021	U	mg/kg dry	1	0.021	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Anthracene [120-12-7]^	0.017	U	mg/kg dry	1	0.017	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Benzo(a)anthracene [56-55-3]^	0.017	U	mg/kg dry	1	0.017	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Benzo(a)pyrene [50-32-8]^	0.018	U	mg/kg dry	1	0.018	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.020	U	mg/kg dry	1	0.020	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.018	U	mg/kg dry	1	0.018	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.023	U	mg/kg dry	1	0.023	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Chrysene [218-01-9]^	0.014	U	mg/kg dry	1	0.014	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.019	U	mg/kg dry	1	0.019	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Fluoranthene [206-44-0]^	0.020	U	mg/kg dry	1	0.020	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Fluorene [86-73-7]^	0.020	U	mg/kg dry	1	0.020	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.018	U	mg/kg dry	1	0.018	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Naphthalene [91-20-3]^	0.021	U	mg/kg dry	1	0.021	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	

ANALYTICAL RESULTS

Description: SB-1 (2-4') **Lab Sample ID:** AA07699-01 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 11:16 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 84.08

Semivolatile Organic Compounds by GCMS SIM

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Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.018	U	mg/kg dry	1	0.018	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	
Pyrene [129-00-0]^	0.019	U	mg/kg dry	1	0.019	0.042	7J28002	EPA 8270D	10/30/17 22:42	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.1*	*1*	*2.30*	*91 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/30/17 22:42*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
4,4'-DDE [72-55-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	QM-07
4,4'-DDT [50-29-3]^	0.0016	U	mg/kg dry	2	0.0016	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0012	U	mg/kg dry	2	0.0012	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
alpha-BHC [319-84-6]^	0.0013	U	mg/kg dry	2	0.0013	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
beta-BHC [319-85-7]^	0.0024	U	mg/kg dry	2	0.0024	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Chlordane (tech) [12789-03-6]^	0.020	U	mg/kg dry	2	0.020	0.078	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
delta-BHC [319-86-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Endosulfan I [959-98-8]^	0.00093	U	mg/kg dry	2	0.00093	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Endosulfan II [33213-65-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	QV-01
Endrin [72-20-8]^	0.0018	U	mg/kg dry	2	0.0018	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Endrin aldehyde [7421-93-4]^	0.0020	U	mg/kg dry	2	0.0020	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Endrin ketone [53494-70-5]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	QV-01
gamma-BHC [58-89-9]^	0.0014	U	mg/kg dry	2	0.0014	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Heptachlor [76-44-8]^	0.0015	U	mg/kg dry	2	0.0015	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Isodrin [465-73-6]^	0.0015	U	mg/kg dry	2	0.0015	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Methoxychlor [72-43-5]^	0.0020	U	mg/kg dry	2	0.0020	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	QV-01
Mirex [2385-85-5]^	0.0026	U	mg/kg dry	2	0.0026	0.0040	7J31006	EPA 8081B	11/01/17 09:06	JJB	
Toxaphene [8001-35-2]^	0.040	U	mg/kg dry	2	0.040	0.078	7J31006	EPA 8081B	11/01/17 09:06	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.027*	*2*	*0.0399*	*68 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 09:06*	*JJB*	
Decachlorobiphenyl	*0.033*	*2*	*0.0399*	*82 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 09:06*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.017	U	mg/kg dry	1	0.017	0.020	7J31021	EPA 8082A	11/01/17 09:25	JJB	
PCB-1221 [11104-28-2]^	0.017	U	mg/kg dry	1	0.017	0.020	7J31021	EPA 8082A	11/01/17 09:25	JJB	
PCB-1232 [11141-16-5]^	0.017	U	mg/kg dry	1	0.017	0.020	7J31021	EPA 8082A	11/01/17 09:25	JJB	
PCB-1248 [12672-29-6]^	0.018	U	mg/kg dry	1	0.018	0.020	7J31021	EPA 8082A	11/01/17 09:25	JJB	
PCB-1254 [11097-69-1]^	0.019	U	mg/kg dry	1	0.019	0.020	7J31021	EPA 8082A	11/01/17 09:25	JJB	
PCB-1260 [11096-82-5]^	0.013	U	mg/kg dry	1	0.013	0.020	7J31021	EPA 8082A	11/01/17 09:25	JJB	

ANALYTICAL RESULTS

Description: SB-1 (2-4') **Lab Sample ID:** AA07699-01 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 11:16 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 84.08

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.030*	*1*	*0.0394*	*75 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 09:25*	*JJB*	
Decachlorobiphenyl	*0.032*	*1*	*0.0394*	*82 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 09:25*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.0	U	mg/kg dry	1	4.0	6.8	7J30017	FL-PRO	11/02/17 02:31	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*1.5*	*1*	*3.95*	*38 %*	*60-118*	*7J30017*	*FL-PRO*	*11/02/17 02:31*	*JJB*	*QS-07*
o-Terphenyl	*1.1*	*1*	*1.98*	*55 %*	*62-109*	*7J30017*	*FL-PRO*	*11/02/17 02:31*	*JJB*	*QS-07*

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0119**		mg/kg dry	1	0.00464	0.0119	7J31036	EPA 7471B	11/02/17 08:40	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**2.57**		mg/kg dry	1	0.511	0.595	7J31001	EPA 6010C	11/01/17 11:19	ACV	
Barium [7440-39-3]^	**10.5**		mg/kg dry	1	0.0523	0.595	7J31001	EPA 6010C	11/01/17 11:19	ACV	
Cadmium [7440-43-9]^	**0.254**		mg/kg dry	1	0.0274	0.0595	7J31001	EPA 6010C	11/01/17 11:19	ACV	
Chromium [7440-47-3]^	**14.6**		mg/kg dry	1	0.190	0.595	7J31001	EPA 6010C	11/01/17 11:19	ACV	
Lead [7439-92-1]^	0.274	U	mg/kg dry	1	0.274	0.595	7J31001	EPA 6010C	11/01/17 11:19	ACV	
Selenium [7782-49-2]^	**4.70**		mg/kg dry	1	0.690	2.38	7J31001	EPA 6010C	11/01/17 11:19	ACV	
Silver [7440-22-4]^	0.0583	U	mg/kg dry	1	0.0583	0.595	7J31001	EPA 6010C	11/01/17 11:19	ACV	

ANALYTICAL RESULTS

Description: SB-1 (4-6')
Lab Sample ID: AA07699-02
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 12:00
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 79.25

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00038	U	mg/kg dry	1	0.00038	0.00095	7K02019	EPA 8260B	11/02/17 15:18	KKW	
Ethylbenzene [100-41-4]^	**0.0039**		mg/kg dry	1	0.00055	0.00095	7K02019	EPA 8260B	11/02/17 15:18	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	**0.0020**		mg/kg dry	1	0.0010	0.0019	7K02019	EPA 8260B	11/02/17 15:18	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00060	U	mg/kg dry	1	0.00060	0.00095	7K02019	EPA 8260B	11/02/17 15:18	KKW	
o-Xylene [95-47-6]^	0.00053	U	mg/kg dry	1	0.00053	0.00095	7K02019	EPA 8260B	11/02/17 15:18	KKW	
Toluene [108-88-3]^	0.00045	U	mg/kg dry	1	0.00045	0.00095	7K02019	EPA 8260B	11/02/17 15:18	KKW	
Xylenes (Total) [1330-20-7]^	**0.0020**		mg/kg dry	1	0.00094	0.0019	7K02019	EPA 8260B	11/02/17 15:18	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.048*	*1*	*0.0474*	*102 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 15:18*	*KKW*	
Dibromofluoromethane	*0.046*	*1*	*0.0474*	*96 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 15:18*	*KKW*	
Toluene-d8	*0.049*	*1*	*0.0474*	*103 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 15:18*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.14	U	mg/kg dry	1	0.14	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.15	U	mg/kg dry	1	0.15	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.15	U	mg/kg dry	1	0.15	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.13	U	mg/kg dry	1	0.13	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.084	U	mg/kg dry	1	0.084	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.19	U	mg/kg dry	1	0.19	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2,4-Dichlorophenol [120-83-2]^	0.32	U	mg/kg dry	1	0.32	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2,4-Dimethylphenol [105-67-9]^	0.29	U	mg/kg dry	1	0.29	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2,4-Dinitrophenol [51-28-5]^	0.11	U	mg/kg dry	1	0.11	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.20	U	mg/kg dry	1	0.20	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.23	U	mg/kg dry	1	0.23	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2-Chloronaphthalene [91-58-7]^	0.12	U	mg/kg dry	1	0.12	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2-Chlorophenol [95-57-8]^	0.29	U	mg/kg dry	1	0.29	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.35	U	mg/kg dry	1	0.35	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	QV-01
2-Methylphenol [95-48-7]^	0.14	U	mg/kg dry	1	0.14	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2-Nitroaniline [88-74-4]^	0.11	U	mg/kg dry	1	0.11	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
2-Nitrophenol [88-75-5]^	0.33	U	mg/kg dry	1	0.33	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.32	U	mg/kg dry	1	0.32	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.26	U	mg/kg dry	1	0.26	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	QV-01
3-Nitroaniline [99-09-2]^	0.10	U	mg/kg dry	1	0.10	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.35	U	mg/kg dry	1	0.35	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
4-Chloroaniline [106-47-8]^	0.082	U	mg/kg dry	1	0.082	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
4-Nitroaniline [100-01-6]^	0.33	U	mg/kg dry	1	0.33	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
4-Nitrophenol [100-02-7]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Benzidine [92-87-5]^	0.11	U	mg/kg dry	1	0.11	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	QV-01
Benzoic acid [65-85-0]^	0.61	U	mg/kg dry	1	0.61	2.1	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Benzyl alcohol [100-51-6]^	0.20	U	mg/kg dry	1	0.20	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.19	U	mg/kg dry	1	0.19	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.18	U	mg/kg dry	1	0.18	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.12	U	mg/kg dry	1	0.12	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	

ANALYTICAL RESULTS

Description: SB-1 (4-6')
Lab Sample ID: AA07699-02
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 12:00
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 79.25

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Butylbenzylphthalate [85-68-7]^	0.18	U	mg/kg dry	1	0.18	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Dibenzofuran [132-64-9]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Diethylphthalate [84-66-2]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Dimethylphthalate [131-11-3]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Di-n-butylphthalate [84-74-2]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Di-n-octylphthalate [117-84-0]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Hexachlorobenzene [118-74-1]^	0.15	U	mg/kg dry	1	0.15	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Hexachlorobutadiene [87-68-3]^	0.16	U	mg/kg dry	1	0.16	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.19	U	mg/kg dry	1	0.19	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	J-05
Hexachloroethane [67-72-1]^	0.13	U	mg/kg dry	1	0.13	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Isophorone [78-59-1]^	0.21	U	mg/kg dry	1	0.21	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Nitrobenzene [98-95-3]^	0.19	U	mg/kg dry	1	0.19	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.15	U	mg/kg dry	1	0.15	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.19	U	mg/kg dry	1	0.19	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.29	U	mg/kg dry	1	0.29	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Pentachlorophenol [87-86-5]^	0.26	U	mg/kg dry	1	0.26	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Phenol [108-95-2]^	0.12	U	mg/kg dry	1	0.12	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	
Pyridine [110-86-1]^	0.19	U	mg/kg dry	1	0.19	0.42	7J27021	EPA 8270D	10/30/17 18:31	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*1.6*	*1*	*2.12*	*76 %*	*30-140*	*7J27021*	*EPA 8270D*	*10/30/17 18:31*	*jfi*	
2-Fluorobiphenyl	*1.6*	*1*	*2.12*	*76 %*	*55-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:31*	*jfi*	
2-Fluorophenol	*1.0*	*1*	*2.12*	*49 %*	*38-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:31*	*jfi*	
Nitrobenzene-d5	*1.1*	*1*	*2.12*	*51 %*	*45-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:31*	*jfi*	
Phenol-d5	*1.2*	*1*	*2.12*	*57 %*	*31-120*	*7J27021*	*EPA 8270D*	*10/30/17 18:31*	*jfi*	
Terphenyl-d14	*2.0*	*1*	*2.12*	*95 %*	*41-174*	*7J27021*	*EPA 8270D*	*10/30/17 18:31*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.024	U	mg/kg dry	1	0.024	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
2-Methylnaphthalene [91-57-6]^	0.023	U	mg/kg dry	1	0.023	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Acenaphthene [83-32-9]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Acenaphthylene [208-96-8]^	0.023	U	mg/kg dry	1	0.023	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Anthracene [120-12-7]^	0.018	U	mg/kg dry	1	0.018	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Benzo(a)anthracene [56-55-3]^	0.018	U	mg/kg dry	1	0.018	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Benzo(a)pyrene [50-32-8]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.024	U	mg/kg dry	1	0.024	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Chrysene [218-01-9]^	0.015	U	mg/kg dry	1	0.015	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.020	U	mg/kg dry	1	0.020	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Fluoranthene [206-44-0]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Fluorene [86-73-7]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Naphthalene [91-20-3]^	**0.040**	I	mg/kg dry	1	0.023	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	

ANALYTICAL RESULTS

Description: SB-1 (4-6')
Lab Sample ID: AA07699-02
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 12:00
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 79.25

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	
Pyrene [129-00-0]^	0.020	U	mg/kg dry	1	0.020	0.044	7J28002	EPA 8270D	10/30/17 23:04	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.2*	*1*	*2.47*	*89 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/30/17 23:04*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0017	U	mg/kg dry	2	0.0017	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
4,4'-DDE [72-55-9]^	0.0016	U	mg/kg dry	2	0.0016	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
4,4'-DDT [50-29-3]^	0.0017	U	mg/kg dry	2	0.0017	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0013	U	mg/kg dry	2	0.0013	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
alpha-BHC [319-84-6]^	0.0014	U	mg/kg dry	2	0.0014	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
beta-BHC [319-85-7]^	0.0025	U	mg/kg dry	2	0.0025	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Chlordane (tech) [12789-03-6]^	0.021	U	mg/kg dry	2	0.021	0.083	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
delta-BHC [319-86-8]^	0.0013	U	mg/kg dry	2	0.0013	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Endosulfan I [959-98-8]^	0.00098	U	mg/kg dry	2	0.00098	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Endosulfan II [33213-65-9]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	QV-01
Endrin [72-20-8]^	0.0019	U	mg/kg dry	2	0.0019	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Endrin aldehyde [7421-93-4]^	0.0021	U	mg/kg dry	2	0.0021	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Endrin ketone [53494-70-5]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	QV-01
gamma-BHC [58-89-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Heptachlor [76-44-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Isodrin [465-73-6]^	0.0016	U	mg/kg dry	2	0.0016	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Methoxychlor [72-43-5]^	0.0022	U	mg/kg dry	2	0.0022	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	QV-01
Mirex [2385-85-5]^	0.0028	U	mg/kg dry	2	0.0028	0.0043	7J31006	EPA 8081B	11/01/17 09:18	JJB	
Toxaphene [8001-35-2]^	0.043	U	mg/kg dry	2	0.043	0.083	7J31006	EPA 8081B	11/01/17 09:18	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.026*	*2*	*0.0426*	*62 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 09:18*	*JJB*	
Decachlorobiphenyl	*0.033*	*2*	*0.0426*	*78 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 09:18*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 09:37	JJB	
PCB-1221 [11104-28-2]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 09:37	JJB	
PCB-1232 [11141-16-5]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 09:37	JJB	
PCB-1248 [12672-29-6]^	0.019	U	mg/kg dry	1	0.019	0.021	7J31021	EPA 8082A	11/01/17 09:37	JJB	
PCB-1254 [11097-69-1]^	0.020	U	mg/kg dry	1	0.020	0.021	7J31021	EPA 8082A	11/01/17 09:37	JJB	
PCB-1260 [11096-82-5]^	0.014	U	mg/kg dry	1	0.014	0.021	7J31021	EPA 8082A	11/01/17 09:37	JJB	

ANALYTICAL RESULTS

Description: SB-1 (4-6')
Lab Sample ID: AA07699-02
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 12:00
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 79.25

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.037*	*1*	*0.0416*	*90 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 09:37*	*JJB*	
Decachlorobiphenyl	*0.039*	*1*	*0.0416*	*93 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 09:37*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.3	U	mg/kg dry	1	4.3	7.2	7J30017	FL-PRO	11/02/17 03:03	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*1.9*	*1*	*4.26*	*44 %*	*60-118*	*7J30017*	*FL-PRO*	*11/02/17 03:03*	*JJB*	*QS-07*
o-Terphenyl	*1.4*	*1*	*2.14*	*64 %*	*62-109*	*7J30017*	*FL-PRO*	*11/02/17 03:03*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0107**	I	mg/kg dry	1	0.00492	0.0126	7J31036	EPA 7471B	11/02/17 08:53	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**3.38**		mg/kg dry	1	0.617	0.717	7J31001	EPA 6010C	11/01/17 11:21	ACV	
Barium [7440-39-3]^	**9.79**		mg/kg dry	1	0.0631	0.717	7J31001	EPA 6010C	11/01/17 11:21	ACV	
Cadmium [7440-43-9]^	**0.261**		mg/kg dry	1	0.0330	0.0717	7J31001	EPA 6010C	11/01/17 11:21	ACV	
Chromium [7440-47-3]^	**17.2**		mg/kg dry	1	0.229	0.717	7J31001	EPA 6010C	11/01/17 11:21	ACV	
Lead [7439-92-1]^	0.330	U	mg/kg dry	1	0.330	0.717	7J31001	EPA 6010C	11/01/17 11:21	ACV	
Selenium [7782-49-2]^	**3.98**		mg/kg dry	1	0.832	2.87	7J31001	EPA 6010C	11/01/17 11:21	ACV	
Silver [7440-22-4]^	0.0703	U	mg/kg dry	1	0.0703	0.717	7J31001	EPA 6010C	11/01/17 11:21	ACV	

ANALYTICAL RESULTS

Description: SB-1 (6-8') **Lab Sample ID:** AA07699-03 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:15 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 82.03

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	**0.0021**		mg/kg dry	1	0.00036	0.00090	7K02019	EPA 8260B	11/02/17 15:47	KKW	
Ethylbenzene [100-41-4]^	**0.097**		mg/kg dry	1	0.00052	0.00090	7K02019	EPA 8260B	11/02/17 15:47	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	**0.079**		mg/kg dry	1	0.00099	0.0018	7K02019	EPA 8260B	11/02/17 15:47	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00057	U	mg/kg dry	1	0.00057	0.00090	7K02019	EPA 8260B	11/02/17 15:47	KKW	
o-Xylene [95-47-6]^	**0.0052**		mg/kg dry	1	0.00051	0.00090	7K02019	EPA 8260B	11/02/17 15:47	KKW	
Toluene [108-88-3]^	0.00043	U	mg/kg dry	1	0.00043	0.00090	7K02019	EPA 8260B	11/02/17 15:47	KKW	
Xylenes (Total) [1330-20-7]^	**0.085**		mg/kg dry	1	0.00090	0.0018	7K02019	EPA 8260B	11/02/17 15:47	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.057*	*1*	*0.0452*	*126 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 15:47*	*KKW*	
Dibromofluoromethane	*0.045*	*1*	*0.0452*	*100 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 15:47*	*KKW*	
Toluene-d8	*0.051*	*1*	*0.0452*	*113 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 15:47*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.13	U	mg/kg dry	1	0.13	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.081	U	mg/kg dry	1	0.081	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2,4-Dichlorophenol [120-83-2]^	0.30	U	mg/kg dry	1	0.30	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2,4-Dimethylphenol [105-67-9]^	0.28	U	mg/kg dry	1	0.28	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2,4-Dinitrophenol [51-28-5]^	0.11	U	mg/kg dry	1	0.11	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.20	U	mg/kg dry	1	0.20	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.22	U	mg/kg dry	1	0.22	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2-Chloronaphthalene [91-58-7]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2-Chlorophenol [95-57-8]^	0.28	U	mg/kg dry	1	0.28	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.34	U	mg/kg dry	1	0.34	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	QV-01
2-Methylphenol [95-48-7]^	0.13	U	mg/kg dry	1	0.13	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2-Nitroaniline [88-74-4]^	0.10	U	mg/kg dry	1	0.10	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
2-Nitrophenol [88-75-5]^	0.32	U	mg/kg dry	1	0.32	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.30	U	mg/kg dry	1	0.30	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.26	U	mg/kg dry	1	0.26	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	QV-01
3-Nitroaniline [99-09-2]^	0.098	U	mg/kg dry	1	0.098	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.34	U	mg/kg dry	1	0.34	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
4-Chloroaniline [106-47-8]^	0.079	U	mg/kg dry	1	0.079	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
4-Nitroaniline [100-01-6]^	0.32	U	mg/kg dry	1	0.32	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
4-Nitrophenol [100-02-7]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Benzidine [92-87-5]^	0.10	U	mg/kg dry	1	0.10	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	QV-01
Benzoic acid [65-85-0]^	0.59	U	mg/kg dry	1	0.59	2.1	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Benzyl alcohol [100-51-6]^	0.20	U	mg/kg dry	1	0.20	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.17	U	mg/kg dry	1	0.17	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	

ANALYTICAL RESULTS

Description: SB-1 (6-8') **Lab Sample ID:** AA07699-03 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:15 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 82.03

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Butylbenzylphthalate [85-68-7]^	0.17	U	mg/kg dry	1	0.17	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Dibenzofuran [132-64-9]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Diethylphthalate [84-66-2]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Dimethylphthalate [131-11-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Di-n-butylphthalate [84-74-2]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Di-n-octylphthalate [117-84-0]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Hexachlorobenzene [118-74-1]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Hexachlorobutadiene [87-68-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	J-05
Hexachloroethane [67-72-1]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Isophorone [78-59-1]^	0.21	U	mg/kg dry	1	0.21	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Nitrobenzene [98-95-3]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.28	U	mg/kg dry	1	0.28	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Pentachlorophenol [87-86-5]^	0.26	U	mg/kg dry	1	0.26	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Phenol [108-95-2]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	
Pyridine [110-86-1]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	10/30/17 19:01	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*1.3*	*1*	*2.01*	*66 %*	*30-140*	*7J27021*	*EPA 8270D*	*10/30/17 19:01*	*jfi*	
2-Fluorobiphenyl	*1.7*	*1*	*2.01*	*85 %*	*55-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:01*	*jfi*	
2-Fluorophenol	*1.2*	*1*	*2.01*	*57 %*	*38-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:01*	*jfi*	
Nitrobenzene-d5	*1.2*	*1*	*2.01*	*58 %*	*45-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:01*	*jfi*	
Phenol-d5	*1.3*	*1*	*2.01*	*63 %*	*31-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:01*	*jfi*	
Terphenyl-d14	*1.6*	*1*	*2.01*	*78 %*	*41-174*	*7J27021*	*EPA 8270D*	*10/30/17 19:01*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	**2.7**		mg/kg dry	1	0.023	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
2-Methylnaphthalene [91-57-6]^	**4.3**		mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Acenaphthene [83-32-9]^	**0.38**		mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Acenaphthylene [208-96-8]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Anthracene [120-12-7]^	0.017	U	mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Benzo(a)anthracene [56-55-3]^	**0.040**	I	mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Benzo(a)pyrene [50-32-8]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.023	U	mg/kg dry	1	0.023	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Chrysene [218-01-9]^	**0.017**	I	mg/kg dry	1	0.015	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.020	U	mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Fluoranthene [206-44-0]^	**0.052**		mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Fluorene [86-73-7]^	**0.77**		mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Naphthalene [91-20-3]^	**0.79**		mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	

ANALYTICAL RESULTS

Description: SB-1 (6-8') **Lab Sample ID:** AA07699-03 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:15 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 82.03

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	**1.7**		mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	
Pyrene [129-00-0]^	**0.33**		mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/30/17 23:26	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.2*	*1*	*2.47*	*90 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/30/17 23:26*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
4,4'-DDE [72-55-9]^	0.0016	U	mg/kg dry	2	0.0016	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
4,4'-DDT [50-29-3]^	0.0016	U	mg/kg dry	2	0.0016	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0012	U	mg/kg dry	2	0.0012	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
alpha-BHC [319-84-6]^	0.0014	U	mg/kg dry	2	0.0014	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
beta-BHC [319-85-7]^	0.0024	U	mg/kg dry	2	0.0024	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Chlordane (tech) [12789-03-6]^	0.020	U	mg/kg dry	2	0.020	0.080	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
delta-BHC [319-86-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Endosulfan I [959-98-8]^	0.00095	U	mg/kg dry	2	0.00095	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Endosulfan II [33213-65-9]^	0.0012	U	mg/kg dry	2	0.0012	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	QV-01
Endrin [72-20-8]^	0.0018	U	mg/kg dry	2	0.0018	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Endrin aldehyde [7421-93-4]^	0.0020	U	mg/kg dry	2	0.0020	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Endrin ketone [53494-70-5]^	0.0011	U	mg/kg dry	2	0.0011	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	QV-01
gamma-BHC [58-89-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Heptachlor [76-44-8]^	0.0015	U	mg/kg dry	2	0.0015	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0012	U	mg/kg dry	2	0.0012	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Isodrin [465-73-6]^	0.0015	U	mg/kg dry	2	0.0015	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Methoxychlor [72-43-5]^	0.0021	U	mg/kg dry	2	0.0021	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	QV-01
Mirex [2385-85-5]^	0.0027	U	mg/kg dry	2	0.0027	0.0041	7J31006	EPA 8081B	11/01/17 09:32	JJB	
Toxaphene [8001-35-2]^	0.041	U	mg/kg dry	2	0.041	0.080	7J31006	EPA 8081B	11/01/17 09:32	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.027*	*2*	*0.0405*	*66 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 09:32*	*JJB*	
Decachlorobiphenyl	*0.032*	*2*	*0.0405*	*80 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 09:32*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 09:49	JJB	
PCB-1221 [11104-28-2]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 09:49	JJB	
PCB-1232 [11141-16-5]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 09:49	JJB	
PCB-1248 [12672-29-6]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 09:49	JJB	
PCB-1254 [11097-69-1]^	0.020	U	mg/kg dry	1	0.020	0.021	7J31021	EPA 8082A	11/01/17 09:49	JJB	
PCB-1260 [11096-82-5]^	0.013	U	mg/kg dry	1	0.013	0.021	7J31021	EPA 8082A	11/01/17 09:49	JJB	

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ANALYTICAL RESULTS

Description: SB-1 (6-8') **Lab Sample ID:** AA07699-03 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:15 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 82.03

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.035*	*1*	*0.0402*	*86 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 09:49*	*JJB*	
Decachlorobiphenyl	*0.046*	*1*	*0.0402*	*114 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 09:49*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	**400**		mg/kg dry	5	21	35	7K02020	FL-PRO	11/06/17 14:43	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*2.8*	*5*	*4.08*	*69 %*	*60-118*	*7K02020*	*FL-PRO*	*11/06/17 14:43*	*JJB*	
o-Terphenyl	*3.6*	*5*	*2.05*	*177 %*	*62-109*	*7K02020*	*FL-PRO*	*11/06/17 14:43*	*JJB*	*QS-06*

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.00801**	I	mg/kg dry	1	0.00475	0.0122	7J31036	EPA 7471B	11/02/17 08:57	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**0.887**		mg/kg dry	1	0.524	0.610	7J31001	EPA 6010C	11/01/17 11:22	ACV	
Barium [7440-39-3]^	**6.03**		mg/kg dry	1	0.0536	0.610	7J31001	EPA 6010C	11/01/17 11:22	ACV	
Cadmium [7440-43-9]^	**0.0630**		mg/kg dry	1	0.0280	0.0610	7J31001	EPA 6010C	11/01/17 11:22	ACV	
Chromium [7440-47-3]^	**3.06**		mg/kg dry	1	0.195	0.610	7J31001	EPA 6010C	11/01/17 11:22	ACV	
Lead [7439-92-1]^	**0.478**	I	mg/kg dry	1	0.280	0.610	7J31001	EPA 6010C	11/01/17 11:22	ACV	
Selenium [7782-49-2]^	0.707	U	mg/kg dry	1	0.707	2.44	7J31001	EPA 6010C	11/01/17 11:22	ACV	
Silver [7440-22-4]^	0.0597	U	mg/kg dry	1	0.0597	0.610	7J31001	EPA 6010C	11/01/17 11:22	ACV	

ANALYTICAL RESULTS

Description: SB-2 (4-6') | **Lab Sample ID:** AA07699-04 | **Received:** 10/27/17 08:00

Matrix: Soil | **Sampled:** 10/25/17 12:25 | **Work Order:** AA07699

Project: Manatee County - Port Manatee | **Sampled By:** Sean Barnes | **% Solids:** 79.75

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00045	U	mg/kg dry	1	0.00045	0.0011	7K02019	EPA 8260B	11/02/17 16:15	KKW	
Ethylbenzene [100-41-4]^	0.00066	U	mg/kg dry	1	0.00066	0.0011	7K02019	EPA 8260B	11/02/17 16:15	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0012	U	mg/kg dry	1	0.0012	0.0023	7K02019	EPA 8260B	11/02/17 16:15	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00071	U	mg/kg dry	1	0.00071	0.0011	7K02019	EPA 8260B	11/02/17 16:15	KKW	
o-Xylene [95-47-6]^	0.00063	U	mg/kg dry	1	0.00063	0.0011	7K02019	EPA 8260B	11/02/17 16:15	KKW	
Toluene [108-88-3]^	0.00053	U	mg/kg dry	1	0.00053	0.0011	7K02019	EPA 8260B	11/02/17 16:15	KKW	
Xylenes (Total) [1330-20-7]^	0.0011	U	mg/kg dry	1	0.0011	0.0023	7K02019	EPA 8260B	11/02/17 16:15	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.061*	*1*	*0.0567*	*107 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 16:15*	*KKW*	
Dibromofluoromethane	*0.055*	*1*	*0.0567*	*98 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 16:15*	*KKW*	
Toluene-d8	*0.060*	*1*	*0.0567*	*106 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 16:15*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.28	U	mg/kg dry	2	0.28	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.30	U	mg/kg dry	2	0.30	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.30	U	mg/kg dry	2	0.30	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.25	U	mg/kg dry	2	0.25	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.17	U	mg/kg dry	2	0.17	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.38	U	mg/kg dry	2	0.38	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2,4-Dichlorophenol [120-83-2]^	0.63	U	mg/kg dry	2	0.63	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2,4-Dimethylphenol [105-67-9]^	0.58	U	mg/kg dry	2	0.58	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2,4-Dinitrophenol [51-28-5]^	0.22	U	mg/kg dry	2	0.22	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.40	U	mg/kg dry	2	0.40	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.45	U	mg/kg dry	2	0.45	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2-Chloronaphthalene [91-58-7]^	0.25	U	mg/kg dry	2	0.25	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2-Chlorophenol [95-57-8]^	0.58	U	mg/kg dry	2	0.58	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.70	U	mg/kg dry	2	0.70	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	QV-01
2-Methylphenol [95-48-7]^	0.28	U	mg/kg dry	2	0.28	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2-Nitroaniline [88-74-4]^	0.21	U	mg/kg dry	2	0.21	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
2-Nitrophenol [88-75-5]^	0.65	U	mg/kg dry	2	0.65	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.63	U	mg/kg dry	2	0.63	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.53	U	mg/kg dry	2	0.53	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	QV-01
3-Nitroaniline [99-09-2]^	0.20	U	mg/kg dry	2	0.20	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.70	U	mg/kg dry	2	0.70	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
4-Chloroaniline [106-47-8]^	0.16	U	mg/kg dry	2	0.16	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
4-Nitroaniline [100-01-6]^	0.65	U	mg/kg dry	2	0.65	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
4-Nitrophenol [100-02-7]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Benzidine [92-87-5]^	0.22	U	mg/kg dry	2	0.22	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	QV-01
Benzoic acid [65-85-0]^	1.2	U	mg/kg dry	2	1.2	4.3	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Benzyl alcohol [100-51-6]^	0.40	U	mg/kg dry	2	0.40	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.38	U	mg/kg dry	2	0.38	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.35	U	mg/kg dry	2	0.35	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.25	U	mg/kg dry	2	0.25	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	

ANALYTICAL RESULTS

Description: SB-2 (4-6') **Lab Sample ID:** AA07699-04 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:25 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 79.75

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Butylbenzylphthalate [85-68-7]^	0.35	U	mg/kg dry	2	0.35	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Dibenzofuran [132-64-9]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Diethylphthalate [84-66-2]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Dimethylphthalate [131-11-3]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Di-n-butylphthalate [84-74-2]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Di-n-octylphthalate [117-84-0]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Hexachlorobenzene [118-74-1]^	0.30	U	mg/kg dry	2	0.30	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Hexachlorobutadiene [87-68-3]^	0.33	U	mg/kg dry	2	0.33	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.38	U	mg/kg dry	2	0.38	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	J-05
Hexachloroethane [67-72-1]^	0.25	U	mg/kg dry	2	0.25	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Isophorone [78-59-1]^	0.43	U	mg/kg dry	2	0.43	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Nitrobenzene [98-95-3]^	0.38	U	mg/kg dry	2	0.38	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.30	U	mg/kg dry	2	0.30	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.38	U	mg/kg dry	2	0.38	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.58	U	mg/kg dry	2	0.58	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Pentachlorophenol [87-86-5]^	0.53	U	mg/kg dry	2	0.53	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Phenol [108-95-2]^	0.25	U	mg/kg dry	2	0.25	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	
Pyridine [110-86-1]^	0.38	U	mg/kg dry	2	0.38	0.83	7J27021	EPA 8270D	10/30/17 22:34	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*1.5*	*2*	*2.10*	*73 %*	*30-140*	*7J27021*	*EPA 8270D*	*10/30/17 22:34*	*jfi*	
2-Fluorobiphenyl	*1.8*	*2*	*2.10*	*87 %*	*55-120*	*7J27021*	*EPA 8270D*	*10/30/17 22:34*	*jfi*	
2-Fluorophenol	*1.2*	*2*	*2.10*	*57 %*	*38-120*	*7J27021*	*EPA 8270D*	*10/30/17 22:34*	*jfi*	
Nitrobenzene-d5	*1.3*	*2*	*2.10*	*60 %*	*45-120*	*7J27021*	*EPA 8270D*	*10/30/17 22:34*	*jfi*	
Phenol-d5	*1.4*	*2*	*2.10*	*65 %*	*31-120*	*7J27021*	*EPA 8270D*	*10/30/17 22:34*	*jfi*	
Terphenyl-d14	*1.7*	*2*	*2.10*	*82 %*	*41-174*	*7J27021*	*EPA 8270D*	*10/30/17 22:34*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.024	U	mg/kg dry	1	0.024	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
2-Methylnaphthalene [91-57-6]^	0.023	U	mg/kg dry	1	0.023	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Acenaphthene [83-32-9]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Acenaphthylene [208-96-8]^	0.023	U	mg/kg dry	1	0.023	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Anthracene [120-12-7]^	0.018	U	mg/kg dry	1	0.018	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Benzo(a)anthracene [56-55-3]^	0.018	U	mg/kg dry	1	0.018	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Benzo(a)pyrene [50-32-8]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.024	U	mg/kg dry	1	0.024	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Chrysene [218-01-9]^	0.015	U	mg/kg dry	1	0.015	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.020	U	mg/kg dry	1	0.020	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Fluoranthene [206-44-0]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Fluorene [86-73-7]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Naphthalene [91-20-3]^	0.023	U	mg/kg dry	1	0.023	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	

ANALYTICAL RESULTS

Description: SB-2 (4-6')
Lab Sample ID: AA07699-04
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 12:25
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 79.75

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	
Pyrene [129-00-0]^	0.020	U	mg/kg dry	1	0.020	0.044	7J28002	EPA 8270D	10/30/17 23:48	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.3*	*1*	*2.51*	*91 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/30/17 23:48*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0017	U	mg/kg dry	2	0.0017	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
4,4'-DDE [72-55-9]^	0.0016	U	mg/kg dry	2	0.0016	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
4,4'-DDT [50-29-3]^	0.0017	U	mg/kg dry	2	0.0017	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0013	U	mg/kg dry	2	0.0013	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
alpha-BHC [319-84-6]^	0.0014	U	mg/kg dry	2	0.0014	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
beta-BHC [319-85-7]^	0.0025	U	mg/kg dry	2	0.0025	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Chlordane (tech) [12789-03-6]^	0.021	U	mg/kg dry	2	0.021	0.083	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
delta-BHC [319-86-8]^	0.0013	U	mg/kg dry	2	0.0013	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Endosulfan I [959-98-8]^	0.00098	U	mg/kg dry	2	0.00098	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Endosulfan II [33213-65-9]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	QV-01
Endrin [72-20-8]^	0.0019	U	mg/kg dry	2	0.0019	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Endrin aldehyde [7421-93-4]^	0.0021	U	mg/kg dry	2	0.0021	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Endrin ketone [53494-70-5]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	QV-01
gamma-BHC [58-89-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Heptachlor [76-44-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0012	U	mg/kg dry	2	0.0012	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Isodrin [465-73-6]^	0.0016	U	mg/kg dry	2	0.0016	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Methoxychlor [72-43-5]^	0.0022	U	mg/kg dry	2	0.0022	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	QV-01
Mirex [2385-85-5]^	0.0028	U	mg/kg dry	2	0.0028	0.0043	7J31006	EPA 8081B	11/01/17 09:44	JJB	
Toxaphene [8001-35-2]^	0.043	U	mg/kg dry	2	0.043	0.083	7J31006	EPA 8081B	11/01/17 09:44	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.024*	*2*	*0.0421*	*58 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 09:44*	*JJB*	
Decachlorobiphenyl	*0.035*	*2*	*0.0421*	*82 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 09:44*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 10:01	JJB	
PCB-1221 [11104-28-2]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 10:01	JJB	
PCB-1232 [11141-16-5]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 10:01	JJB	
PCB-1248 [12672-29-6]^	0.019	U	mg/kg dry	1	0.019	0.021	7J31021	EPA 8082A	11/01/17 10:01	JJB	
PCB-1254 [11097-69-1]^	0.020	U	mg/kg dry	1	0.020	0.021	7J31021	EPA 8082A	11/01/17 10:01	JJB	
PCB-1260 [11096-82-5]^	0.014	U	mg/kg dry	1	0.014	0.021	7J31021	EPA 8082A	11/01/17 10:01	JJB	

ANALYTICAL RESULTS

Description: SB-2 (4-6') **Lab Sample ID:** AA07699-04 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:25 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 79.75

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.039*	*1*	*0.0419*	*93 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 10:01*	*JJB*	
Decachlorobiphenyl	*0.039*	*1*	*0.0419*	*94 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 10:01*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.3	U	mg/kg dry	1	4.3	7.1	7K02020	FL-PRO	11/03/17 10:54	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*2.7*	*1*	*4.15*	*64 %*	*60-118*	*7K02020*	*FL-PRO*	*11/03/17 10:54*	*JJB*	
o-Terphenyl	*1.8*	*1*	*2.08*	*89 %*	*62-109*	*7K02020*	*FL-PRO*	*11/03/17 10:54*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0114**	I	mg/kg dry	1	0.00489	0.0125	7J31036	EPA 7471B	11/02/17 09:10	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**9.69**		mg/kg dry	1	0.749	0.871	7J31001	EPA 6010C	11/01/17 11:24	ACV	
Barium [7440-39-3]^	**9.98**		mg/kg dry	1	0.0766	0.871	7J31001	EPA 6010C	11/01/17 11:24	ACV	
Cadmium [7440-43-9]^	**0.216**		mg/kg dry	1	0.0401	0.0871	7J31001	EPA 6010C	11/01/17 11:24	ACV	
Chromium [7440-47-3]^	**31.7**		mg/kg dry	1	0.279	0.871	7J31001	EPA 6010C	11/01/17 11:24	ACV	
Lead [7439-92-1]^	0.401	U	mg/kg dry	1	0.401	0.871	7J31001	EPA 6010C	11/01/17 11:24	ACV	
Selenium [7782-49-2]^	**4.63**		mg/kg dry	1	1.01	3.48	7J31001	EPA 6010C	11/01/17 11:24	ACV	
Silver [7440-22-4]^	0.0853	U	mg/kg dry	1	0.0853	0.871	7J31001	EPA 6010C	11/01/17 11:24	ACV	

ANALYTICAL RESULTS

Description: SB-2 (6-8') **Lab Sample ID:** AA07699-05 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:36 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 80.94

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00027	U	mg/kg dry	1	0.00027	0.00068	7K02019	EPA 8260B	11/02/17 16:44	KKW	
Ethylbenzene [100-41-4]^	0.00039	U	mg/kg dry	1	0.00039	0.00068	7K02019	EPA 8260B	11/02/17 16:44	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.00075	U	mg/kg dry	1	0.00075	0.0014	7K02019	EPA 8260B	11/02/17 16:44	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00043	U	mg/kg dry	1	0.00043	0.00068	7K02019	EPA 8260B	11/02/17 16:44	KKW	
o-Xylene [95-47-6]^	0.00038	U	mg/kg dry	1	0.00038	0.00068	7K02019	EPA 8260B	11/02/17 16:44	KKW	
Toluene [108-88-3]^	0.00032	U	mg/kg dry	1	0.00032	0.00068	7K02019	EPA 8260B	11/02/17 16:44	KKW	
Xylenes (Total) [1330-20-7]^	0.00067	U	mg/kg dry	1	0.00067	0.0014	7K02019	EPA 8260B	11/02/17 16:44	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.034*	*1*	*0.0340*	*100 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 16:44*	*KKW*	
Dibromofluoromethane	*0.032*	*1*	*0.0340*	*95 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 16:44*	*KKW*	
Toluene-d8	*0.034*	*1*	*0.0340*	*100 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 16:44*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.14	U	mg/kg dry	1	0.14	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.082	U	mg/kg dry	1	0.082	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2,4-Dichlorophenol [120-83-2]^	0.31	U	mg/kg dry	1	0.31	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2,4-Dimethylphenol [105-67-9]^	0.28	U	mg/kg dry	1	0.28	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2,4-Dinitrophenol [51-28-5]^	0.11	U	mg/kg dry	1	0.11	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.20	U	mg/kg dry	1	0.20	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.22	U	mg/kg dry	1	0.22	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2-Chloronaphthalene [91-58-7]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2-Chlorophenol [95-57-8]^	0.28	U	mg/kg dry	1	0.28	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.35	U	mg/kg dry	1	0.35	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	QV-01
2-Methylphenol [95-48-7]^	0.14	U	mg/kg dry	1	0.14	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2-Nitroaniline [88-74-4]^	0.11	U	mg/kg dry	1	0.11	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
2-Nitrophenol [88-75-5]^	0.32	U	mg/kg dry	1	0.32	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.31	U	mg/kg dry	1	0.31	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.26	U	mg/kg dry	1	0.26	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	QV-01
3-Nitroaniline [99-09-2]^	0.099	U	mg/kg dry	1	0.099	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.35	U	mg/kg dry	1	0.35	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
4-Chloroaniline [106-47-8]^	0.080	U	mg/kg dry	1	0.080	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
4-Nitroaniline [100-01-6]^	0.32	U	mg/kg dry	1	0.32	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
4-Nitrophenol [100-02-7]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Benzidine [92-87-5]^	0.11	U	mg/kg dry	1	0.11	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	QV-01
Benzoic acid [65-85-0]^	0.59	U	mg/kg dry	1	0.59	2.1	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Benzyl alcohol [100-51-6]^	0.20	U	mg/kg dry	1	0.20	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.17	U	mg/kg dry	1	0.17	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	

ANALYTICAL RESULTS

Description: SB-2 (6-8')
Lab Sample ID: AA07699-05
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 12:36
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 80.94

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Butylbenzylphthalate [85-68-7]^	0.17	U	mg/kg dry	1	0.17	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Dibenzofuran [132-64-9]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Diethylphthalate [84-66-2]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Dimethylphthalate [131-11-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Di-n-butylphthalate [84-74-2]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Di-n-octylphthalate [117-84-0]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Hexachlorobenzene [118-74-1]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Hexachlorobutadiene [87-68-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	J-05
Hexachloroethane [67-72-1]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Isophorone [78-59-1]^	0.21	U	mg/kg dry	1	0.21	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Nitrobenzene [98-95-3]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.28	U	mg/kg dry	1	0.28	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Pentachlorophenol [87-86-5]^	0.26	U	mg/kg dry	1	0.26	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Phenol [108-95-2]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	
Pyridine [110-86-1]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	10/30/17 19:31	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*1.7*	*1*	*2.03*	*86 %*	*30-140*	*7J27021*	*EPA 8270D*	*10/30/17 19:31*	*jfi*	
2-Fluorobiphenyl	*1.7*	*1*	*2.03*	*86 %*	*55-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:31*	*jfi*	
2-Fluorophenol	*1.1*	*1*	*2.03*	*55 %*	*38-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:31*	*jfi*	
Nitrobenzene-d5	*1.2*	*1*	*2.03*	*58 %*	*45-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:31*	*jfi*	
Phenol-d5	*1.3*	*1*	*2.03*	*66 %*	*31-120*	*7J27021*	*EPA 8270D*	*10/30/17 19:31*	*jfi*	
Terphenyl-d14	*2.1*	*1*	*2.03*	*102 %*	*41-174*	*7J27021*	*EPA 8270D*	*10/30/17 19:31*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	**0.037**	I	mg/kg dry	1	0.023	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
2-Methylnaphthalene [91-57-6]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Acenaphthene [83-32-9]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Acenaphthylene [208-96-8]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Anthracene [120-12-7]^	0.017	U	mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Benzo(a)anthracene [56-55-3]^	0.017	U	mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Benzo(a)pyrene [50-32-8]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.023	U	mg/kg dry	1	0.023	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Chrysene [218-01-9]^	0.015	U	mg/kg dry	1	0.015	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.020	U	mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Fluoranthene [206-44-0]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Fluorene [86-73-7]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Naphthalene [91-20-3]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	

ANALYTICAL RESULTS

Description: SB-2 (6-8')
Lab Sample ID: AA07699-05
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 12:36
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 80.94

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	
Pyrene [129-00-0]^	0.020	U	mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/31/17 00:10	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.2*	*1*	*2.47*	*88 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/31/17 00:10*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
4,4'-DDE [72-55-9]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
4,4'-DDT [50-29-3]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0013	U	mg/kg dry	2	0.0013	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
alpha-BHC [319-84-6]^	0.0014	U	mg/kg dry	2	0.0014	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
beta-BHC [319-85-7]^	0.0025	U	mg/kg dry	2	0.0025	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Chlordane (tech) [12789-03-6]^	0.021	U	mg/kg dry	2	0.021	0.082	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
delta-BHC [319-86-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Endosulfan I [959-98-8]^	0.00096	U	mg/kg dry	2	0.00096	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Endosulfan II [33213-65-9]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	QV-01
Endrin [72-20-8]^	0.0018	U	mg/kg dry	2	0.0018	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Endrin aldehyde [7421-93-4]^	0.0021	U	mg/kg dry	2	0.0021	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Endrin ketone [53494-70-5]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	QV-01
gamma-BHC [58-89-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Heptachlor [76-44-8]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Isodrin [465-73-6]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Methoxychlor [72-43-5]^	0.0021	U	mg/kg dry	2	0.0021	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	QV-01
Mirex [2385-85-5]^	0.0027	U	mg/kg dry	2	0.0027	0.0042	7J31006	EPA 8081B	11/01/17 09:56	JJB	
Toxaphene [8001-35-2]^	0.042	U	mg/kg dry	2	0.042	0.082	7J31006	EPA 8081B	11/01/17 09:56	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.026*	*2*	*0.0419*	*62 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 09:56*	*JJB*	
Decachlorobiphenyl	*0.032*	*2*	*0.0419*	*76 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 09:56*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:04	JJB	
PCB-1221 [11104-28-2]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:04	JJB	
PCB-1232 [11141-16-5]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:04	JJB	
PCB-1248 [12672-29-6]^	0.019	U	mg/kg dry	1	0.019	0.021	7J31021	EPA 8082A	11/01/17 11:04	JJB	
PCB-1254 [11097-69-1]^	0.020	U	mg/kg dry	1	0.020	0.021	7J31021	EPA 8082A	11/01/17 11:04	JJB	
PCB-1260 [11096-82-5]^	0.014	U	mg/kg dry	1	0.014	0.021	7J31021	EPA 8082A	11/01/17 11:04	JJB	

ANALYTICAL RESULTS

Description: SB-2 (6-8') **Lab Sample ID:** AA07699-05 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 12:36 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 80.94

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.037*	*1*	*0.0413*	*89 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 11:04*	*JJB*	
Decachlorobiphenyl	*0.041*	*1*	*0.0413*	*99 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 11:04*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.2	U	mg/kg dry	1	4.2	7.0	7K02020	FL-PRO	11/03/17 11:27	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*2.6*	*1*	*4.05*	*64 %*	*60-118*	*7K02020*	*FL-PRO*	*11/03/17 11:27*	*JJB*	
o-Terphenyl	*1.8*	*1*	*2.03*	*89 %*	*62-109*	*7K02020*	*FL-PRO*	*11/03/17 11:27*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.00438	U	mg/kg dry	1	0.00438	0.0112	7J31036	EPA 7471B	11/02/17 09:13	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**2.11**		mg/kg dry	1	0.632	0.735	7J31001	EPA 6010C	11/01/17 11:25	ACV	
Barium [7440-39-3]^	**4.84**		mg/kg dry	1	0.0647	0.735	7J31001	EPA 6010C	11/01/17 11:25	ACV	
Cadmium [7440-43-9]^	**0.0704**	I	mg/kg dry	1	0.0338	0.0735	7J31001	EPA 6010C	11/01/17 11:25	ACV	
Chromium [7440-47-3]^	**6.00**		mg/kg dry	1	0.235	0.735	7J31001	EPA 6010C	11/01/17 11:25	ACV	
Lead [7439-92-1]^	**0.812**		mg/kg dry	1	0.338	0.735	7J31001	EPA 6010C	11/01/17 11:25	ACV	
Selenium [7782-49-2]^	0.853	U	mg/kg dry	1	0.853	2.94	7J31001	EPA 6010C	11/01/17 11:25	ACV	
Silver [7440-22-4]^	0.0721	U	mg/kg dry	1	0.0721	0.735	7J31001	EPA 6010C	11/01/17 11:25	ACV	

ANALYTICAL RESULTS

Description: SB-3 (2-4')
Lab Sample ID: AA07699-06
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 15:20
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 85.01

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00047	U	mg/kg dry	1	0.00047	0.0012	7K02019	EPA 8260B	11/02/17 17:13	KKW	
Ethylbenzene [100-41-4]^	0.00068	U	mg/kg dry	1	0.00068	0.0012	7K02019	EPA 8260B	11/02/17 17:13	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0013	U	mg/kg dry	1	0.0013	0.0024	7K02019	EPA 8260B	11/02/17 17:13	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00074	U	mg/kg dry	1	0.00074	0.0012	7K02019	EPA 8260B	11/02/17 17:13	KKW	
o-Xylene [95-47-6]^	0.00066	U	mg/kg dry	1	0.00066	0.0012	7K02019	EPA 8260B	11/02/17 17:13	KKW	
Toluene [108-88-3]^	0.00055	U	mg/kg dry	1	0.00055	0.0012	7K02019	EPA 8260B	11/02/17 17:13	KKW	
Xylenes (Total) [1330-20-7]^	0.0012	U	mg/kg dry	1	0.0012	0.0024	7K02019	EPA 8260B	11/02/17 17:13	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.065*	*1*	*0.0642*	*101 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 17:13*	*KKW*	
Dibromofluoromethane	*0.064*	*1*	*0.0642*	*100 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 17:13*	*KKW*	
Toluene-d8	*0.067*	*1*	*0.0642*	*105 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 17:13*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.13	U	mg/kg dry	1	0.13	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.078	U	mg/kg dry	1	0.078	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2,4-Dichlorophenol [120-83-2]^	0.29	U	mg/kg dry	1	0.29	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2,4-Dimethylphenol [105-67-9]^	0.27	U	mg/kg dry	1	0.27	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2,4-Dinitrophenol [51-28-5]^	0.10	U	mg/kg dry	1	0.10	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.19	U	mg/kg dry	1	0.19	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.21	U	mg/kg dry	1	0.21	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2-Chloronaphthalene [91-58-7]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2-Chlorophenol [95-57-8]^	0.27	U	mg/kg dry	1	0.27	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.33	U	mg/kg dry	1	0.33	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2-Methylphenol [95-48-7]^	0.13	U	mg/kg dry	1	0.13	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2-Nitroaniline [88-74-4]^	0.10	U	mg/kg dry	1	0.10	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
2-Nitrophenol [88-75-5]^	0.31	U	mg/kg dry	1	0.31	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.29	U	mg/kg dry	1	0.29	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.25	U	mg/kg dry	1	0.25	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
3-Nitroaniline [99-09-2]^	0.094	U	mg/kg dry	1	0.094	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.33	U	mg/kg dry	1	0.33	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
4-Chloroaniline [106-47-8]^	0.076	U	mg/kg dry	1	0.076	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
4-Nitroaniline [100-01-6]^	0.31	U	mg/kg dry	1	0.31	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
4-Nitrophenol [100-02-7]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Benzidine [92-87-5]^	0.10	U	mg/kg dry	1	0.10	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	QV-01
Benzoic acid [65-85-0]^	0.56	U	mg/kg dry	1	0.56	2.0	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Benzyl alcohol [100-51-6]^	0.19	U	mg/kg dry	1	0.19	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.16	U	mg/kg dry	1	0.16	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	

ANALYTICAL RESULTS

Description: SB-3 (2-4') **Lab Sample ID:** AA07699-06 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 15:20 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 85.01

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Butylbenzylphthalate [85-68-7]^	0.16	U	mg/kg dry	1	0.16	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Dibenzofuran [132-64-9]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Diethylphthalate [84-66-2]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Dimethylphthalate [131-11-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Di-n-butylphthalate [84-74-2]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Di-n-octylphthalate [117-84-0]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Hexachlorobenzene [118-74-1]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Hexachlorobutadiene [87-68-3]^	0.15	U	mg/kg dry	1	0.15	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Hexachloroethane [67-72-1]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Isophorone [78-59-1]^	0.20	U	mg/kg dry	1	0.20	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Nitrobenzene [98-95-3]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.14	U	mg/kg dry	1	0.14	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.27	U	mg/kg dry	1	0.27	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Pentachlorophenol [87-86-5]^	0.25	U	mg/kg dry	1	0.25	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Phenol [108-95-2]^	0.12	U	mg/kg dry	1	0.12	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	
Pyridine [110-86-1]^	0.18	U	mg/kg dry	1	0.18	0.39	7J27021	EPA 8270D	11/01/17 17:17	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*1.4*	*1*	*1.93*	*75 %*	*30-140*	*7J27021*	*EPA 8270D*	*11/01/17 17:17*	*jfi*	
2-Fluorobiphenyl	*1.8*	*1*	*1.93*	*91 %*	*55-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:17*	*jfi*	
2-Fluorophenol	*1.3*	*1*	*1.93*	*65 %*	*38-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:17*	*jfi*	
Nitrobenzene-d5	*1.2*	*1*	*1.93*	*63 %*	*45-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:17*	*jfi*	
Phenol-d5	*1.4*	*1*	*1.93*	*73 %*	*31-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:17*	*jfi*	
Terphenyl-d14	*2.2*	*1*	*1.93*	*112 %*	*41-174*	*7J27021*	*EPA 8270D*	*11/01/17 17:17*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.022	U	mg/kg dry	1	0.022	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
2-Methylnaphthalene [91-57-6]^	0.021	U	mg/kg dry	1	0.021	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Acenaphthene [83-32-9]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Acenaphthylene [208-96-8]^	0.021	U	mg/kg dry	1	0.021	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Anthracene [120-12-7]^	0.016	U	mg/kg dry	1	0.016	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Benzo(a)anthracene [56-55-3]^	0.016	U	mg/kg dry	1	0.016	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Benzo(a)pyrene [50-32-8]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.020	U	mg/kg dry	1	0.020	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.022	U	mg/kg dry	1	0.022	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Chrysene [218-01-9]^	0.014	U	mg/kg dry	1	0.014	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.019	U	mg/kg dry	1	0.019	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Fluoranthene [206-44-0]^	0.020	U	mg/kg dry	1	0.020	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Fluorene [86-73-7]^	0.020	U	mg/kg dry	1	0.020	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Naphthalene [91-20-3]^	0.021	U	mg/kg dry	1	0.021	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	

ANALYTICAL RESULTS

Description: SB-3 (2-4')
Lab Sample ID: AA07699-06
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 15:20
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 85.01

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	
Pyrene [129-00-0]^	0.019	U	mg/kg dry	1	0.019	0.041	7J28002	EPA 8270D	10/31/17 00:32	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.1*	*1*	*2.31*	*92 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/31/17 00:32*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
4,4'-DDE [72-55-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
4,4'-DDT [50-29-3]^	0.0016	U	mg/kg dry	2	0.0016	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0012	U	mg/kg dry	2	0.0012	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
alpha-BHC [319-84-6]^	0.0013	U	mg/kg dry	2	0.0013	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
beta-BHC [319-85-7]^	0.0024	U	mg/kg dry	2	0.0024	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Chlordane (tech) [12789-03-6]^	0.020	U	mg/kg dry	2	0.020	0.078	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
delta-BHC [319-86-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Endosulfan I [959-98-8]^	0.00092	U	mg/kg dry	2	0.00092	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Endosulfan II [33213-65-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	QV-01
Endrin [72-20-8]^	0.0017	U	mg/kg dry	2	0.0017	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Endrin aldehyde [7421-93-4]^	0.0020	U	mg/kg dry	2	0.0020	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Endrin ketone [53494-70-5]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	QV-01
gamma-BHC [58-89-9]^	0.0014	U	mg/kg dry	2	0.0014	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Heptachlor [76-44-8]^	0.0015	U	mg/kg dry	2	0.0015	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0011	U	mg/kg dry	2	0.0011	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Isodrin [465-73-6]^	0.0015	U	mg/kg dry	2	0.0015	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Methoxychlor [72-43-5]^	0.0020	U	mg/kg dry	2	0.0020	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	QV-01
Mirex [2385-85-5]^	0.0026	U	mg/kg dry	2	0.0026	0.0040	7J31006	EPA 8081B	11/01/17 10:09	JJB	
Toxaphene [8001-35-2]^	0.040	U	mg/kg dry	2	0.040	0.078	7J31006	EPA 8081B	11/01/17 10:09	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.020*	*2*	*0.0395*	*50 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 10:09*	*JJB*	
Decachlorobiphenyl	*0.025*	*2*	*0.0395*	*64 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 10:09*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.016	U	mg/kg dry	1	0.016	0.020	7J31021	EPA 8082A	11/01/17 11:16	JJB	
PCB-1221 [11104-28-2]^	0.016	U	mg/kg dry	1	0.016	0.020	7J31021	EPA 8082A	11/01/17 11:16	JJB	
PCB-1232 [11141-16-5]^	0.016	U	mg/kg dry	1	0.016	0.020	7J31021	EPA 8082A	11/01/17 11:16	JJB	
PCB-1248 [12672-29-6]^	0.018	U	mg/kg dry	1	0.018	0.020	7J31021	EPA 8082A	11/01/17 11:16	JJB	
PCB-1254 [11097-69-1]^	0.019	U	mg/kg dry	1	0.019	0.020	7J31021	EPA 8082A	11/01/17 11:16	JJB	
PCB-1260 [11096-82-5]^	0.013	U	mg/kg dry	1	0.013	0.020	7J31021	EPA 8082A	11/01/17 11:16	JJB	

ANALYTICAL RESULTS

Description: SB-3 (2-4') **Lab Sample ID:** AA07699-06 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 15:20 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 85.01

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.037*	*1*	*0.0397*	*93 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 11:16*	*JJB*	
Decachlorobiphenyl	*0.037*	*1*	*0.0397*	*92 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 11:16*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.0	U	mg/kg dry	1	4.0	6.7	7K02020	FL-PRO	11/03/17 12:00	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*2.4*	*1*	*3.87*	*63 %*	*60-118*	*7K02020*	*FL-PRO*	*11/03/17 12:00*	*JJB*	
o-Terphenyl	*1.5*	*1*	*1.94*	*78 %*	*62-109*	*7K02020*	*FL-PRO*	*11/03/17 12:00*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0124**		mg/kg dry	1	0.00459	0.0118	7J31036	EPA 7471B	11/02/17 09:17	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**5.36**		mg/kg dry	1	0.703	0.817	7J31001	EPA 6010C	11/01/17 11:27	ACV	
Barium [7440-39-3]^	**13.7**		mg/kg dry	1	0.0719	0.817	7J31001	EPA 6010C	11/01/17 11:27	ACV	
Cadmium [7440-43-9]^	**0.254**		mg/kg dry	1	0.0376	0.0817	7J31001	EPA 6010C	11/01/17 11:27	ACV	
Chromium [7440-47-3]^	**26.7**		mg/kg dry	1	0.261	0.817	7J31001	EPA 6010C	11/01/17 11:27	ACV	
Lead [7439-92-1]^	0.376	U	mg/kg dry	1	0.376	0.817	7J31001	EPA 6010C	11/01/17 11:27	ACV	
Selenium [7782-49-2]^	**4.96**		mg/kg dry	1	0.948	3.27	7J31001	EPA 6010C	11/01/17 11:27	ACV	
Silver [7440-22-4]^	0.0801	U	mg/kg dry	1	0.0801	0.817	7J31001	EPA 6010C	11/01/17 11:27	ACV	

ANALYTICAL RESULTS

Description: SB-3 (6-8')
Matrix: Soil
Project: Manatee County - Port Manatee

Lab Sample ID: AA07699-07
Sampled: 10/25/17 15:32
Sampled By: Sean Barnes

Received: 10/27/17 08:00
Work Order: AA07699
% Solids: 81.66

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00028	U	mg/kg dry	1	0.00028	0.00071	7K02019	EPA 8260B	11/02/17 17:41	KKW	
Ethylbenzene [100-41-4]^	0.00041	U	mg/kg dry	1	0.00041	0.00071	7K02019	EPA 8260B	11/02/17 17:41	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.00078	U	mg/kg dry	1	0.00078	0.0014	7K02019	EPA 8260B	11/02/17 17:41	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00045	U	mg/kg dry	1	0.00045	0.00071	7K02019	EPA 8260B	11/02/17 17:41	KKW	
o-Xylene [95-47-6]^	0.00040	U	mg/kg dry	1	0.00040	0.00071	7K02019	EPA 8260B	11/02/17 17:41	KKW	
Toluene [108-88-3]^	0.00033	U	mg/kg dry	1	0.00033	0.00071	7K02019	EPA 8260B	11/02/17 17:41	KKW	
Xylenes (Total) [1330-20-7]^	0.00070	U	mg/kg dry	1	0.00070	0.0014	7K02019	EPA 8260B	11/02/17 17:41	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.036*	*1*	*0.0354*	*102 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 17:41*	*KKW*	
Dibromofluoromethane	*0.036*	*1*	*0.0354*	*102 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 17:41*	*KKW*	
Toluene-d8	*0.037*	*1*	*0.0354*	*105 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 17:41*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.13	U	mg/kg dry	1	0.13	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.082	U	mg/kg dry	1	0.082	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2,4-Dichlorophenol [120-83-2]^	0.31	U	mg/kg dry	1	0.31	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2,4-Dimethylphenol [105-67-9]^	0.28	U	mg/kg dry	1	0.28	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2,4-Dinitrophenol [51-28-5]^	0.11	U	mg/kg dry	1	0.11	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.20	U	mg/kg dry	1	0.20	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.22	U	mg/kg dry	1	0.22	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2-Chloronaphthalene [91-58-7]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2-Chlorophenol [95-57-8]^	0.28	U	mg/kg dry	1	0.28	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.34	U	mg/kg dry	1	0.34	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2-Methylphenol [95-48-7]^	0.13	U	mg/kg dry	1	0.13	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2-Nitroaniline [88-74-4]^	0.10	U	mg/kg dry	1	0.10	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
2-Nitrophenol [88-75-5]^	0.32	U	mg/kg dry	1	0.32	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.31	U	mg/kg dry	1	0.31	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.26	U	mg/kg dry	1	0.26	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
3-Nitroaniline [99-09-2]^	0.098	U	mg/kg dry	1	0.098	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.34	U	mg/kg dry	1	0.34	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
4-Chloroaniline [106-47-8]^	0.080	U	mg/kg dry	1	0.080	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
4-Nitroaniline [100-01-6]^	0.32	U	mg/kg dry	1	0.32	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
4-Nitrophenol [100-02-7]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Benzidine [92-87-5]^	0.11	U	mg/kg dry	1	0.11	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	QV-01
Benzoic acid [65-85-0]^	0.59	U	mg/kg dry	1	0.59	2.1	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Benzyl alcohol [100-51-6]^	0.20	U	mg/kg dry	1	0.20	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.17	U	mg/kg dry	1	0.17	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	

ANALYTICAL RESULTS

Description: SB-3 (6-8') **Lab Sample ID:** AA07699-07 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 15:32 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 81.66

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Butylbenzylphthalate [85-68-7]^	0.17	U	mg/kg dry	1	0.17	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Dibenzofuran [132-64-9]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Diethylphthalate [84-66-2]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Dimethylphthalate [131-11-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Di-n-butylphthalate [84-74-2]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Di-n-octylphthalate [117-84-0]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Hexachlorobenzene [118-74-1]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Hexachlorobutadiene [87-68-3]^	0.16	U	mg/kg dry	1	0.16	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Hexachloroethane [67-72-1]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Isophorone [78-59-1]^	0.21	U	mg/kg dry	1	0.21	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Nitrobenzene [98-95-3]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.15	U	mg/kg dry	1	0.15	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.28	U	mg/kg dry	1	0.28	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Pentachlorophenol [87-86-5]^	0.26	U	mg/kg dry	1	0.26	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Phenol [108-95-2]^	0.12	U	mg/kg dry	1	0.12	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	
Pyridine [110-86-1]^	0.18	U	mg/kg dry	1	0.18	0.40	7J27021	EPA 8270D	11/01/17 15:45	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*1.6*	*1*	*2.02*	*81 %*	*30-140*	*7J27021*	*EPA 8270D*	*11/01/17 15:45*	*jfi*	
2-Fluorobiphenyl	*1.4*	*1*	*2.02*	*71 %*	*55-120*	*7J27021*	*EPA 8270D*	*11/01/17 15:45*	*jfi*	
2-Fluorophenol	*1.1*	*1*	*2.02*	*57 %*	*38-120*	*7J27021*	*EPA 8270D*	*11/01/17 15:45*	*jfi*	
Nitrobenzene-d5	*1.0*	*1*	*2.02*	*52 %*	*45-120*	*7J27021*	*EPA 8270D*	*11/01/17 15:45*	*jfi*	
Phenol-d5	*1.2*	*1*	*2.02*	*62 %*	*31-120*	*7J27021*	*EPA 8270D*	*11/01/17 15:45*	*jfi*	
Terphenyl-d14	*2.0*	*1*	*2.02*	*97 %*	*41-174*	*7J27021*	*EPA 8270D*	*11/01/17 15:45*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.023	U	mg/kg dry	1	0.023	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
2-Methylnaphthalene [91-57-6]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Acenaphthene [83-32-9]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Acenaphthylene [208-96-8]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Anthracene [120-12-7]^	0.017	U	mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Benzo(a)anthracene [56-55-3]^	0.017	U	mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Benzo(a)pyrene [50-32-8]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.023	U	mg/kg dry	1	0.023	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Chrysene [218-01-9]^	0.015	U	mg/kg dry	1	0.015	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.020	U	mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Fluoranthene [206-44-0]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Fluorene [86-73-7]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Naphthalene [91-20-3]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	

ANALYTICAL RESULTS

Description: SB-3 (6-8')
Matrix: Soil
Project: Manatee County - Port Manatee
Lab Sample ID: AA07699-07
Sampled: 10/25/17 15:32
Sampled By: Sean Barnes
Received: 10/27/17 08:00
Work Order: AA07699
% Solids: 81.66

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.018	U	mg/kg dry	1	0.018	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	
Pyrene [129-00-0]^	0.020	U	mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/31/17 00:54	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.2*	*1*	*2.45*	*88 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/31/17 00:54*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
4,4'-DDE [72-55-9]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
4,4'-DDT [50-29-3]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
alpha-BHC [319-84-6]^	0.0014	U	mg/kg dry	2	0.0014	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
beta-BHC [319-85-7]^	0.0024	U	mg/kg dry	2	0.0024	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Chlordane (tech) [12789-03-6]^	0.021	U	mg/kg dry	2	0.021	0.081	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
delta-BHC [319-86-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Endosulfan I [959-98-8]^	0.00096	U	mg/kg dry	2	0.00096	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Endosulfan II [33213-65-9]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	QV-01
Endrin [72-20-8]^	0.0018	U	mg/kg dry	2	0.0018	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Endrin aldehyde [7421-93-4]^	0.0020	U	mg/kg dry	2	0.0020	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Endrin ketone [53494-70-5]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	QV-01
gamma-BHC [58-89-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Heptachlor [76-44-8]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Isodrin [465-73-6]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Methoxychlor [72-43-5]^	0.0021	U	mg/kg dry	2	0.0021	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	QV-01
Mirex [2385-85-5]^	0.0027	U	mg/kg dry	2	0.0027	0.0042	7J31006	EPA 8081B	11/01/17 10:21	JJB	
Toxaphene [8001-35-2]^	0.042	U	mg/kg dry	2	0.042	0.081	7J31006	EPA 8081B	11/01/17 10:21	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.022*	*2*	*0.0414*	*54 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 10:21*	*JJB*	
Decachlorobiphenyl	*0.030*	*2*	*0.0414*	*72 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 10:21*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:28	JJB	
PCB-1221 [11104-28-2]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:28	JJB	
PCB-1232 [11141-16-5]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:28	JJB	
PCB-1248 [12672-29-6]^	0.018	U	mg/kg dry	1	0.018	0.021	7J31021	EPA 8082A	11/01/17 11:28	JJB	
PCB-1254 [11097-69-1]^	0.020	U	mg/kg dry	1	0.020	0.021	7J31021	EPA 8082A	11/01/17 11:28	JJB	
PCB-1260 [11096-82-5]^	0.013	U	mg/kg dry	1	0.013	0.021	7J31021	EPA 8082A	11/01/17 11:28	JJB	

ANALYTICAL RESULTS

Description: SB-3 (6-8') **Lab Sample ID:** AA07699-07 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 15:32 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 81.66

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.028*	*1*	*0.0403*	*70 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 11:28*	*JJB*	
Decachlorobiphenyl	*0.028*	*1*	*0.0403*	*70 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 11:28*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.2	U	mg/kg dry	1	4.2	7.0	7J30017	FL-PRO	11/02/17 06:10	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*1.5*	*1*	*4.06*	*36 %*	*60-118*	*7J30017*	*FL-PRO*	*11/02/17 06:10*	*JJB*	*QS-07*
o-Terphenyl	*1.0*	*1*	*2.04*	*51 %*	*62-109*	*7J30017*	*FL-PRO*	*11/02/17 06:10*	*JJB*	*QS-07*

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.00983**	I	mg/kg dry	1	0.00478	0.0122	7J31036	EPA 7471B	11/02/17 09:21	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**2.44**		mg/kg dry	1	0.527	0.612	7J31001	EPA 6010C	11/01/17 11:28	ACV	
Barium [7440-39-3]^	**7.56**		mg/kg dry	1	0.0539	0.612	7J31001	EPA 6010C	11/01/17 11:28	ACV	
Cadmium [7440-43-9]^	**0.201**		mg/kg dry	1	0.0282	0.0612	7J31001	EPA 6010C	11/01/17 11:28	ACV	
Chromium [7440-47-3]^	**11.8**		mg/kg dry	1	0.196	0.612	7J31001	EPA 6010C	11/01/17 11:28	ACV	
Lead [7439-92-1]^	0.282	U	mg/kg dry	1	0.282	0.612	7J31001	EPA 6010C	11/01/17 11:28	ACV	
Selenium [7782-49-2]^	**3.85**		mg/kg dry	1	0.710	2.45	7J31001	EPA 6010C	11/01/17 11:28	ACV	
Silver [7440-22-4]^	**0.0830**	I	mg/kg dry	1	0.0600	0.612	7J31001	EPA 6010C	11/01/17 11:28	ACV	

ANALYTICAL RESULTS

Description: SB-4 (2-4') **Lab Sample ID:** AA07699-08 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 16:50 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 80.63

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00050	U	mg/kg dry	1	0.00050	0.0012	7K02019	EPA 8260B	11/02/17 18:10	KKW	
Ethylbenzene [100-41-4]^	0.00072	U	mg/kg dry	1	0.00072	0.0012	7K02019	EPA 8260B	11/02/17 18:10	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0014	U	mg/kg dry	1	0.0014	0.0025	7K02019	EPA 8260B	11/02/17 18:10	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00078	U	mg/kg dry	1	0.00078	0.0012	7K02019	EPA 8260B	11/02/17 18:10	KKW	
o-Xylene [95-47-6]^	0.00069	U	mg/kg dry	1	0.00069	0.0012	7K02019	EPA 8260B	11/02/17 18:10	KKW	
Toluene [108-88-3]^	0.00058	U	mg/kg dry	1	0.00058	0.0012	7K02019	EPA 8260B	11/02/17 18:10	KKW	
Xylenes (Total) [1330-20-7]^	0.0012	U	mg/kg dry	1	0.0012	0.0025	7K02019	EPA 8260B	11/02/17 18:10	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.064*	*1*	*0.0637*	*100 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 18:10*	*KKW*	
Dibromofluoromethane	*0.061*	*1*	*0.0637*	*95 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 18:10*	*KKW*	
Toluene-d8	*0.067*	*1*	*0.0637*	*105 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 18:10*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.14	U	mg/kg dry	1	0.14	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.083	U	mg/kg dry	1	0.083	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2,4-Dichlorophenol [120-83-2]^	0.31	U	mg/kg dry	1	0.31	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2,4-Dimethylphenol [105-67-9]^	0.29	U	mg/kg dry	1	0.29	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2,4-Dinitrophenol [51-28-5]^	0.11	U	mg/kg dry	1	0.11	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.20	U	mg/kg dry	1	0.20	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.22	U	mg/kg dry	1	0.22	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2-Chloronaphthalene [91-58-7]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2-Chlorophenol [95-57-8]^	0.29	U	mg/kg dry	1	0.29	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.35	U	mg/kg dry	1	0.35	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2-Methylphenol [95-48-7]^	0.14	U	mg/kg dry	1	0.14	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2-Nitroaniline [88-74-4]^	0.11	U	mg/kg dry	1	0.11	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
2-Nitrophenol [88-75-5]^	0.32	U	mg/kg dry	1	0.32	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.31	U	mg/kg dry	1	0.31	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.26	U	mg/kg dry	1	0.26	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
3-Nitroaniline [99-09-2]^	0.099	U	mg/kg dry	1	0.099	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.35	U	mg/kg dry	1	0.35	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
4-Chloroaniline [106-47-8]^	0.081	U	mg/kg dry	1	0.081	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
4-Nitroaniline [100-01-6]^	0.32	U	mg/kg dry	1	0.32	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
4-Nitrophenol [100-02-7]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Benzidine [92-87-5]^	0.11	U	mg/kg dry	1	0.11	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	QV-01
Benzoic acid [65-85-0]^	0.60	U	mg/kg dry	1	0.60	2.1	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Benzyl alcohol [100-51-6]^	0.20	U	mg/kg dry	1	0.20	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.17	U	mg/kg dry	1	0.17	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	

ANALYTICAL RESULTS

Description: SB-4 (2-4') **Lab Sample ID:** AA07699-08 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 16:50 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 80.63

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Butylbenzylphthalate [85-68-7]^	0.17	U	mg/kg dry	1	0.17	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Dibenzofuran [132-64-9]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Diethylphthalate [84-66-2]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Dimethylphthalate [131-11-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Di-n-butylphthalate [84-74-2]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Di-n-octylphthalate [117-84-0]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Hexachlorobenzene [118-74-1]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Hexachlorobutadiene [87-68-3]^	0.16	U	mg/kg dry	1	0.16	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Hexachloroethane [67-72-1]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Isophorone [78-59-1]^	0.21	U	mg/kg dry	1	0.21	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Nitrobenzene [98-95-3]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.15	U	mg/kg dry	1	0.15	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.29	U	mg/kg dry	1	0.29	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Pentachlorophenol [87-86-5]^	0.26	U	mg/kg dry	1	0.26	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Phenol [108-95-2]^	0.12	U	mg/kg dry	1	0.12	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	
Pyridine [110-86-1]^	0.19	U	mg/kg dry	1	0.19	0.41	7J27021	EPA 8270D	11/01/17 17:47	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*0.98*	*1*	*2.05*	*48 %*	*30-140*	*7J27021*	*EPA 8270D*	*11/01/17 17:47*	*jfi*	
2-Fluorobiphenyl	*1.8*	*1*	*2.05*	*87 %*	*55-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:47*	*jfi*	
2-Fluorophenol	*1.1*	*1*	*2.05*	*54 %*	*38-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:47*	*jfi*	
Nitrobenzene-d5	*1.2*	*1*	*2.05*	*60 %*	*45-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:47*	*jfi*	
Phenol-d5	*1.4*	*1*	*2.05*	*70 %*	*31-120*	*7J27021*	*EPA 8270D*	*11/01/17 17:47*	*jfi*	
Terphenyl-d14	*2.0*	*1*	*2.05*	*96 %*	*41-174*	*7J27021*	*EPA 8270D*	*11/01/17 17:47*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.024	U	mg/kg dry	1	0.024	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
2-Methylnaphthalene [91-57-6]^	**0.028**	I	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Acenaphthene [83-32-9]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Acenaphthylene [208-96-8]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Anthracene [120-12-7]^	0.017	U	mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Benzo(a)anthracene [56-55-3]^	**0.045**		mg/kg dry	1	0.017	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Benzo(a)pyrene [50-32-8]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Benzo(b)fluoranthene [205-99-2]^	**0.025**	I	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.024	U	mg/kg dry	1	0.024	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Chrysene [218-01-9]^	**0.023**	I	mg/kg dry	1	0.015	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.020	U	mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Fluoranthene [206-44-0]^	**0.048**		mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Fluorene [86-73-7]^	0.021	U	mg/kg dry	1	0.021	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.019	U	mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Naphthalene [91-20-3]^	0.022	U	mg/kg dry	1	0.022	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	

ANALYTICAL RESULTS

Description: SB-4 (2-4') **Lab Sample ID:** AA07699-08 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 16:50 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 80.63

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	**0.080**		mg/kg dry	1	0.019	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	
Pyrene [129-00-0]^	**0.045**		mg/kg dry	1	0.020	0.043	7J28002	EPA 8270D	10/31/17 01:16	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.3*	*1*	*2.51*	*91 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/31/17 01:16*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
4,4'-DDE [72-55-9]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
4,4'-DDT [50-29-3]^	0.0016	U	mg/kg dry	2	0.0016	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0013	U	mg/kg dry	2	0.0013	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
alpha-BHC [319-84-6]^	0.0014	U	mg/kg dry	2	0.0014	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
beta-BHC [319-85-7]^	0.0025	U	mg/kg dry	2	0.0025	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Chlordane (tech) [12789-03-6]^	0.021	U	mg/kg dry	2	0.021	0.082	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Chlordane-alpha [5103-71-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Chlordane-gamma [5566-34-7]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
delta-BHC [319-86-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Dieldrin [60-57-1]^	0.0011	U	mg/kg dry	2	0.0011	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Endosulfan I [959-98-8]^	0.00097	U	mg/kg dry	2	0.00097	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Endosulfan II [33213-65-9]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	QV-01
Endrin [72-20-8]^	0.0018	U	mg/kg dry	2	0.0018	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Endrin aldehyde [7421-93-4]^	0.0021	U	mg/kg dry	2	0.0021	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Endrin ketone [53494-70-5]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	QV-01
gamma-BHC [58-89-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Heptachlor [76-44-8]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0012	U	mg/kg dry	2	0.0012	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Isodrin [465-73-6]^	0.0015	U	mg/kg dry	2	0.0015	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Methoxychlor [72-43-5]^	0.0021	U	mg/kg dry	2	0.0021	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	QV-01
Mirex [2385-85-5]^	0.0027	U	mg/kg dry	2	0.0027	0.0042	7J31006	EPA 8081B	11/01/17 10:34	JJB	
Toxaphene [8001-35-2]^	0.042	U	mg/kg dry	2	0.042	0.082	7J31006	EPA 8081B	11/01/17 10:34	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.023*	*2*	*0.0419*	*54 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 10:34*	*JJB*	
Decachlorobiphenyl	*0.031*	*2*	*0.0419*	*74 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 10:34*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:39	JJB	
PCB-1221 [11104-28-2]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:39	JJB	
PCB-1232 [11141-16-5]^	0.017	U	mg/kg dry	1	0.017	0.021	7J31021	EPA 8082A	11/01/17 11:39	JJB	
PCB-1248 [12672-29-6]^	0.019	U	mg/kg dry	1	0.019	0.021	7J31021	EPA 8082A	11/01/17 11:39	JJB	
PCB-1254 [11097-69-1]^	0.020	U	mg/kg dry	1	0.020	0.021	7J31021	EPA 8082A	11/01/17 11:39	JJB	
PCB-1260 [11096-82-5]^	0.014	U	mg/kg dry	1	0.014	0.021	7J31021	EPA 8082A	11/01/17 11:39	JJB	

ANALYTICAL RESULTS

Description: SB-4 (2-4') **Lab Sample ID:** AA07699-08 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 16:50 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 80.63

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.039*	*1*	*0.0419*	*94 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 11:39*	*JJB*	
Decachlorobiphenyl	*0.042*	*1*	*0.0419*	*101 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 11:39*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	**50**		mg/kg dry	1	4.2	7.1	7K02020	FL-PRO	11/03/17 13:40	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*2.6*	*1*	*4.12*	*62 %*	*60-118*	*7K02020*	*FL-PRO*	*11/03/17 13:40*	*JJB*	
o-Terphenyl	*1.7*	*1*	*2.07*	*80 %*	*62-109*	*7K02020*	*FL-PRO*	*11/03/17 13:40*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0119**	I	mg/kg dry	1	0.00484	0.0124	7J31036	EPA 7471B	11/02/17 09:27	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**7.26**		mg/kg dry	1	0.731	0.849	7J31001	EPA 6010C	11/01/17 11:30	ACV	
Barium [7440-39-3]^	**15.8**		mg/kg dry	1	0.0748	0.849	7J31001	EPA 6010C	11/01/17 11:30	ACV	
Cadmium [7440-43-9]^	**0.403**		mg/kg dry	1	0.0391	0.0849	7J31001	EPA 6010C	11/01/17 11:30	ACV	
Chromium [7440-47-3]^	**28.2**		mg/kg dry	1	0.272	0.849	7J31001	EPA 6010C	11/01/17 11:30	ACV	
Lead [7439-92-1]^	0.391	U	mg/kg dry	1	0.391	0.849	7J31001	EPA 6010C	11/01/17 11:30	ACV	
Selenium [7782-49-2]^	**2.96**	I	mg/kg dry	1	0.985	3.40	7J31001	EPA 6010C	11/01/17 11:30	ACV	
Silver [7440-22-4]^	0.0832	U	mg/kg dry	1	0.0832	0.849	7J31001	EPA 6010C	11/01/17 11:30	ACV	

ANALYTICAL RESULTS

Description: SB-4 (6-8')
Lab Sample ID: AA07699-09
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 17:00
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 70.84

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00041	U	mg/kg dry	1	0.00041	0.0010	7K02019	EPA 8260B	11/02/17 18:38	KKW	
Ethylbenzene [100-41-4]^	0.00059	U	mg/kg dry	1	0.00059	0.0010	7K02019	EPA 8260B	11/02/17 18:38	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0011	U	mg/kg dry	1	0.0011	0.0020	7K02019	EPA 8260B	11/02/17 18:38	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00064	U	mg/kg dry	1	0.00064	0.0010	7K02019	EPA 8260B	11/02/17 18:38	KKW	
o-Xylene [95-47-6]^	0.00057	U	mg/kg dry	1	0.00057	0.0010	7K02019	EPA 8260B	11/02/17 18:38	KKW	
Toluene [108-88-3]^	0.00048	U	mg/kg dry	1	0.00048	0.0010	7K02019	EPA 8260B	11/02/17 18:38	KKW	
Xylenes (Total) [1330-20-7]^	0.0010	U	mg/kg dry	1	0.0010	0.0020	7K02019	EPA 8260B	11/02/17 18:38	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.052*	*1*	*0.0511*	*101 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 18:38*	*KKW*	
Dibromofluoromethane	*0.049*	*1*	*0.0511*	*95 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 18:38*	*KKW*	
Toluene-d8	*0.052*	*1*	*0.0511*	*102 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 18:38*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.16	U	mg/kg dry	1	0.16	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.17	U	mg/kg dry	1	0.17	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.17	U	mg/kg dry	1	0.17	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.14	U	mg/kg dry	1	0.14	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.094	U	mg/kg dry	1	0.094	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.21	U	mg/kg dry	1	0.21	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2,4-Dichlorophenol [120-83-2]^	0.35	U	mg/kg dry	1	0.35	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2,4-Dimethylphenol [105-67-9]^	0.32	U	mg/kg dry	1	0.32	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2,4-Dinitrophenol [51-28-5]^	0.13	U	mg/kg dry	1	0.13	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.23	U	mg/kg dry	1	0.23	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.25	U	mg/kg dry	1	0.25	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2-Chloronaphthalene [91-58-7]^	0.14	U	mg/kg dry	1	0.14	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2-Chlorophenol [95-57-8]^	0.32	U	mg/kg dry	1	0.32	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.40	U	mg/kg dry	1	0.40	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2-Methylphenol [95-48-7]^	0.16	U	mg/kg dry	1	0.16	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2-Nitroaniline [88-74-4]^	0.12	U	mg/kg dry	1	0.12	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
2-Nitrophenol [88-75-5]^	0.37	U	mg/kg dry	1	0.37	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.35	U	mg/kg dry	1	0.35	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.30	U	mg/kg dry	1	0.30	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
3-Nitroaniline [99-09-2]^	0.11	U	mg/kg dry	1	0.11	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.40	U	mg/kg dry	1	0.40	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
4-Chloroaniline [106-47-8]^	0.092	U	mg/kg dry	1	0.092	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
4-Nitroaniline [100-01-6]^	0.37	U	mg/kg dry	1	0.37	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
4-Nitrophenol [100-02-7]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Benzidine [92-87-5]^	0.12	U	mg/kg dry	1	0.12	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	QV-01
Benzoic acid [65-85-0]^	0.68	U	mg/kg dry	1	0.68	2.4	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Benzyl alcohol [100-51-6]^	0.23	U	mg/kg dry	1	0.23	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.21	U	mg/kg dry	1	0.21	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.20	U	mg/kg dry	1	0.20	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.14	U	mg/kg dry	1	0.14	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	

ANALYTICAL RESULTS

Description: SB-4 (6-8') **Lab Sample ID:** AA07699-09 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 17:00 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 70.84

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Butylbenzylphthalate [85-68-7]^	0.20	U	mg/kg dry	1	0.20	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Dibenzofuran [132-64-9]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Diethylphthalate [84-66-2]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Dimethylphthalate [131-11-3]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Di-n-butylphthalate [84-74-2]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Di-n-octylphthalate [117-84-0]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Hexachlorobenzene [118-74-1]^	0.17	U	mg/kg dry	1	0.17	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Hexachlorobutadiene [87-68-3]^	0.18	U	mg/kg dry	1	0.18	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.21	U	mg/kg dry	1	0.21	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Hexachloroethane [67-72-1]^	0.14	U	mg/kg dry	1	0.14	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Isophorone [78-59-1]^	0.24	U	mg/kg dry	1	0.24	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Nitrobenzene [98-95-3]^	0.21	U	mg/kg dry	1	0.21	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.17	U	mg/kg dry	1	0.17	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.21	U	mg/kg dry	1	0.21	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.32	U	mg/kg dry	1	0.32	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Pentachlorophenol [87-86-5]^	0.30	U	mg/kg dry	1	0.30	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Phenol [108-95-2]^	0.14	U	mg/kg dry	1	0.14	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	
Pyridine [110-86-1]^	0.21	U	mg/kg dry	1	0.21	0.47	7J27021	EPA 8270D	11/01/17 16:16	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*2.0*	*1*	*2.35*	*87 %*	*30-140*	*7J27021*	*EPA 8270D*	*11/01/17 16:16*	*jfi*	
2-Fluorobiphenyl	*1.8*	*1*	*2.35*	*79 %*	*55-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:16*	*jfi*	
2-Fluorophenol	*1.3*	*1*	*2.35*	*56 %*	*38-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:16*	*jfi*	
Nitrobenzene-d5	*1.3*	*1*	*2.35*	*55 %*	*45-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:16*	*jfi*	
Phenol-d5	*1.5*	*1*	*2.35*	*62 %*	*31-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:16*	*jfi*	
Terphenyl-d14	*2.3*	*1*	*2.35*	*98 %*	*41-174*	*7J27021*	*EPA 8270D*	*11/01/17 16:16*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.027	U	mg/kg dry	1	0.027	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
2-Methylnaphthalene [91-57-6]^	0.025	U	mg/kg dry	1	0.025	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Acenaphthene [83-32-9]^	0.021	U	mg/kg dry	1	0.021	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Acenaphthylene [208-96-8]^	0.025	U	mg/kg dry	1	0.025	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Anthracene [120-12-7]^	0.020	U	mg/kg dry	1	0.020	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Benzo(a)anthracene [56-55-3]^	0.020	U	mg/kg dry	1	0.020	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Benzo(a)pyrene [50-32-8]^	0.021	U	mg/kg dry	1	0.021	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.024	U	mg/kg dry	1	0.024	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.021	U	mg/kg dry	1	0.021	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.027	U	mg/kg dry	1	0.027	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Chrysene [218-01-9]^	0.017	U	mg/kg dry	1	0.017	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.023	U	mg/kg dry	1	0.023	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Fluoranthene [206-44-0]^	0.024	U	mg/kg dry	1	0.024	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Fluorene [86-73-7]^	0.024	U	mg/kg dry	1	0.024	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.021	U	mg/kg dry	1	0.021	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Naphthalene [91-20-3]^	0.025	U	mg/kg dry	1	0.025	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	

ANALYTICAL RESULTS

Description: SB-4 (6-8')
Matrix: Soil
Project: Manatee County - Port Manatee
Lab Sample ID: AA07699-09
Sampled: 10/25/17 17:00
Sampled By: Sean Barnes
Received: 10/27/17 08:00
Work Order: AA07699
% Solids: 70.84

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.021	U	mg/kg dry	1	0.021	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	
Pyrene [129-00-0]^	0.023	U	mg/kg dry	1	0.023	0.049	7J28002	EPA 8270D	10/31/17 01:38	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.5*	*1*	*2.75*	*89 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/31/17 01:38*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0019	U	mg/kg dry	2	0.0019	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
4,4'-DDE [72-55-9]^	0.0018	U	mg/kg dry	2	0.0018	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
4,4'-DDT [50-29-3]^	0.0019	U	mg/kg dry	2	0.0019	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0014	U	mg/kg dry	2	0.0014	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
alpha-BHC [319-84-6]^	0.0016	U	mg/kg dry	2	0.0016	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
beta-BHC [319-85-7]^	0.0028	U	mg/kg dry	2	0.0028	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Chlordane (tech) [12789-03-6]^	0.024	U	mg/kg dry	2	0.024	0.093	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Chlordane-alpha [5103-71-9]^	0.0013	U	mg/kg dry	2	0.0013	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Chlordane-gamma [5566-34-7]^	0.0013	U	mg/kg dry	2	0.0013	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
delta-BHC [319-86-8]^	0.0014	U	mg/kg dry	2	0.0014	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Dieldrin [60-57-1]^	0.0013	U	mg/kg dry	2	0.0013	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Endosulfan I [959-98-8]^	0.0011	U	mg/kg dry	2	0.0011	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Endosulfan II [33213-65-9]^	0.0014	U	mg/kg dry	2	0.0014	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0014	U	mg/kg dry	2	0.0014	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	QV-01
Endrin [72-20-8]^	0.0021	U	mg/kg dry	2	0.0021	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Endrin aldehyde [7421-93-4]^	0.0023	U	mg/kg dry	2	0.0023	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Endrin ketone [53494-70-5]^	0.0013	U	mg/kg dry	2	0.0013	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	QV-01
gamma-BHC [58-89-9]^	0.0017	U	mg/kg dry	2	0.0017	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Heptachlor [76-44-8]^	0.0018	U	mg/kg dry	2	0.0018	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0014	U	mg/kg dry	2	0.0014	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Isodrin [465-73-6]^	0.0018	U	mg/kg dry	2	0.0018	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Methoxychlor [72-43-5]^	0.0024	U	mg/kg dry	2	0.0024	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	QV-01
Mirex [2385-85-5]^	0.0031	U	mg/kg dry	2	0.0031	0.0048	7J31006	EPA 8081B	11/01/17 10:46	JJB	
Toxaphene [8001-35-2]^	0.048	U	mg/kg dry	2	0.048	0.093	7J31006	EPA 8081B	11/01/17 10:46	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.027*	*2*	*0.0475*	*56 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 10:46*	*JJB*	
Decachlorobiphenyl	*0.031*	*2*	*0.0475*	*66 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 10:46*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.020	U	mg/kg dry	1	0.020	0.024	7J31021	EPA 8082A	11/01/17 11:51	JJB	
PCB-1221 [11104-28-2]^	0.020	U	mg/kg dry	1	0.020	0.024	7J31021	EPA 8082A	11/01/17 11:51	JJB	
PCB-1232 [11141-16-5]^	0.020	U	mg/kg dry	1	0.020	0.024	7J31021	EPA 8082A	11/01/17 11:51	JJB	
PCB-1248 [12672-29-6]^	0.021	U	mg/kg dry	1	0.021	0.024	7J31021	EPA 8082A	11/01/17 11:51	JJB	
PCB-1254 [11097-69-1]^	0.023	U	mg/kg dry	1	0.023	0.024	7J31021	EPA 8082A	11/01/17 11:51	JJB	
PCB-1260 [11096-82-5]^	0.016	U	mg/kg dry	1	0.016	0.024	7J31021	EPA 8082A	11/01/17 11:51	JJB	

ANALYTICAL RESULTS

Description: SB-4 (6-8') **Lab Sample ID:** AA07699-09 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 17:00 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 70.84

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.035*	*1*	*0.0474*	*74 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 11:51*	*JJB*	
Decachlorobiphenyl	*0.039*	*1*	*0.0474*	*82 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 11:51*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.8	U	mg/kg dry	1	4.8	8.0	7J30017	FL-PRO	11/02/17 07:13	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*1.8*	*1*	*4.67*	*39 %*	*60-118*	*7J30017*	*FL-PRO*	*11/02/17 07:13*	*JJB*	*QS-07*
o-Terphenyl	*1.3*	*1*	*2.35*	*54 %*	*62-109*	*7J30017*	*FL-PRO*	*11/02/17 07:13*	*JJB*	*QS-07*

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0138**	I	mg/kg dry	1	0.00551	0.0141	7J31036	EPA 7471B	11/02/17 09:31	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**3.70**		mg/kg dry	1	0.607	0.706	7J31001	EPA 6010C	11/01/17 11:31	ACV	
Barium [7440-39-3]^	**9.96**		mg/kg dry	1	0.0621	0.706	7J31001	EPA 6010C	11/01/17 11:31	ACV	
Cadmium [7440-43-9]^	**0.224**		mg/kg dry	1	0.0325	0.0706	7J31001	EPA 6010C	11/01/17 11:31	ACV	
Chromium [7440-47-3]^	**17.9**		mg/kg dry	1	0.226	0.706	7J31001	EPA 6010C	11/01/17 11:31	ACV	
Lead [7439-92-1]^	**0.649**	I	mg/kg dry	1	0.325	0.706	7J31001	EPA 6010C	11/01/17 11:31	ACV	
Selenium [7782-49-2]^	**2.89**		mg/kg dry	1	0.819	2.82	7J31001	EPA 6010C	11/01/17 11:31	ACV	
Silver [7440-22-4]^	0.0692	U	mg/kg dry	1	0.0692	0.706	7J31001	EPA 6010C	11/01/17 11:31	ACV	

ANALYTICAL RESULTS

Description: SB-5 (0-2') **Lab Sample ID:** AA07699-10 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 17:38 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 89.62

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00045	U	mg/kg dry	1	0.00045	0.0011	7K02019	EPA 8260B	11/02/17 19:07	KKW	
Ethylbenzene [100-41-4]^	0.00065	U	mg/kg dry	1	0.00065	0.0011	7K02019	EPA 8260B	11/02/17 19:07	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0012	U	mg/kg dry	1	0.0012	0.0022	7K02019	EPA 8260B	11/02/17 19:07	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00070	U	mg/kg dry	1	0.00070	0.0011	7K02019	EPA 8260B	11/02/17 19:07	KKW	
o-Xylene [95-47-6]^	0.00062	U	mg/kg dry	1	0.00062	0.0011	7K02019	EPA 8260B	11/02/17 19:07	KKW	
Toluene [108-88-3]^	0.00052	U	mg/kg dry	1	0.00052	0.0011	7K02019	EPA 8260B	11/02/17 19:07	KKW	
Xylenes (Total) [1330-20-7]^	0.0011	U	mg/kg dry	1	0.0011	0.0022	7K02019	EPA 8260B	11/02/17 19:07	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.051*	*1*	*0.0541*	*94 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 19:07*	*KKW*	
Dibromofluoromethane	*0.051*	*1*	*0.0541*	*94 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 19:07*	*KKW*	
Toluene-d8	*0.054*	*1*	*0.0541*	*99 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 19:07*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.12	U	mg/kg dry	1	0.12	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.13	U	mg/kg dry	1	0.13	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.13	U	mg/kg dry	1	0.13	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.11	U	mg/kg dry	1	0.11	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.074	U	mg/kg dry	1	0.074	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.17	U	mg/kg dry	1	0.17	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2,4-Dichlorophenol [120-83-2]^	0.28	U	mg/kg dry	1	0.28	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2,4-Dimethylphenol [105-67-9]^	0.26	U	mg/kg dry	1	0.26	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2,4-Dinitrophenol [51-28-5]^	0.099	U	mg/kg dry	1	0.099	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.18	U	mg/kg dry	1	0.18	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.20	U	mg/kg dry	1	0.20	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2-Chloronaphthalene [91-58-7]^	0.11	U	mg/kg dry	1	0.11	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2-Chlorophenol [95-57-8]^	0.26	U	mg/kg dry	1	0.26	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.31	U	mg/kg dry	1	0.31	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2-Methylphenol [95-48-7]^	0.12	U	mg/kg dry	1	0.12	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2-Nitroaniline [88-74-4]^	0.095	U	mg/kg dry	1	0.095	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
2-Nitrophenol [88-75-5]^	0.29	U	mg/kg dry	1	0.29	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.28	U	mg/kg dry	1	0.28	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.23	U	mg/kg dry	1	0.23	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
3-Nitroaniline [99-09-2]^	0.089	U	mg/kg dry	1	0.089	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.31	U	mg/kg dry	1	0.31	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
4-Chloroaniline [106-47-8]^	0.073	U	mg/kg dry	1	0.073	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
4-Nitroaniline [100-01-6]^	0.29	U	mg/kg dry	1	0.29	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
4-Nitrophenol [100-02-7]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Benzidine [92-87-5]^	0.096	U	mg/kg dry	1	0.096	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	QV-01
Benzoic acid [65-85-0]^	0.54	U	mg/kg dry	1	0.54	1.9	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Benzyl alcohol [100-51-6]^	0.18	U	mg/kg dry	1	0.18	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.17	U	mg/kg dry	1	0.17	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.16	U	mg/kg dry	1	0.16	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.11	U	mg/kg dry	1	0.11	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	

ANALYTICAL RESULTS

Description: SB-5 (0-2') **Lab Sample ID:** AA07699-10 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 17:38 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 89.62

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Butylbenzylphthalate [85-68-7]^	0.16	U	mg/kg dry	1	0.16	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Dibenzofuran [132-64-9]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Diethylphthalate [84-66-2]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Dimethylphthalate [131-11-3]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Di-n-butylphthalate [84-74-2]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Di-n-octylphthalate [117-84-0]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Hexachlorobenzene [118-74-1]^	0.13	U	mg/kg dry	1	0.13	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Hexachlorobutadiene [87-68-3]^	0.15	U	mg/kg dry	1	0.15	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.17	U	mg/kg dry	1	0.17	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Hexachloroethane [67-72-1]^	0.11	U	mg/kg dry	1	0.11	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Isophorone [78-59-1]^	0.19	U	mg/kg dry	1	0.19	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Nitrobenzene [98-95-3]^	0.17	U	mg/kg dry	1	0.17	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.13	U	mg/kg dry	1	0.13	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.17	U	mg/kg dry	1	0.17	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.26	U	mg/kg dry	1	0.26	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Pentachlorophenol [87-86-5]^	0.23	U	mg/kg dry	1	0.23	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Phenol [108-95-2]^	0.11	U	mg/kg dry	1	0.11	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	
Pyridine [110-86-1]^	0.17	U	mg/kg dry	1	0.17	0.37	7J27021	EPA 8270D	11/01/17 18:18	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*0.96*	*1*	*1.88*	*51 %*	*30-140*	*7J27021*	*EPA 8270D*	*11/01/17 18:18*	*jfi*	
2-Fluorobiphenyl	*1.5*	*1*	*1.88*	*81 %*	*55-120*	*7J27021*	*EPA 8270D*	*11/01/17 18:18*	*jfi*	
2-Fluorophenol	*0.98*	*1*	*1.88*	*52 %*	*38-120*	*7J27021*	*EPA 8270D*	*11/01/17 18:18*	*jfi*	
Nitrobenzene-d5	*1.1*	*1*	*1.88*	*58 %*	*45-120*	*7J27021*	*EPA 8270D*	*11/01/17 18:18*	*jfi*	
Phenol-d5	*1.3*	*1*	*1.88*	*67 %*	*31-120*	*7J27021*	*EPA 8270D*	*11/01/17 18:18*	*jfi*	
Terphenyl-d14	*1.9*	*1*	*1.88*	*100 %*	*41-174*	*7J27021*	*EPA 8270D*	*11/01/17 18:18*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	**0.025**	I	mg/kg dry	1	0.021	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
2-Methylnaphthalene [91-57-6]^	**0.029**	I	mg/kg dry	1	0.020	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Acenaphthene [83-32-9]^	0.017	U	mg/kg dry	1	0.017	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Acenaphthylene [208-96-8]^	0.020	U	mg/kg dry	1	0.020	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Anthracene [120-12-7]^	0.016	U	mg/kg dry	1	0.016	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Benzo(a)anthracene [56-55-3]^	**0.061**		mg/kg dry	1	0.016	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Benzo(a)pyrene [50-32-8]^	**0.067**		mg/kg dry	1	0.017	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Benzo(b)fluoranthene [205-99-2]^	**0.11**		mg/kg dry	1	0.019	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Benzo(g,h,i)perylene [191-24-2]^	**0.058**		mg/kg dry	1	0.017	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Benzo(k)fluoranthene [207-08-9]^	**0.040**		mg/kg dry	1	0.021	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Chrysene [218-01-9]^	**0.10**		mg/kg dry	1	0.013	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.018	U	mg/kg dry	1	0.018	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Fluoranthene [206-44-0]^	**0.17**		mg/kg dry	1	0.019	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Fluorene [86-73-7]^	0.019	U	mg/kg dry	1	0.019	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	**0.043**		mg/kg dry	1	0.017	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Naphthalene [91-20-3]^	0.020	U	mg/kg dry	1	0.020	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	

ANALYTICAL RESULTS

Description: SB-5 (0-2')
Matrix: Soil
Project: Manatee County - Port Manatee
Lab Sample ID: AA07699-10
Sampled: 10/25/17 17:38
Sampled By: Sean Barnes
Received: 10/27/17 08:00
Work Order: AA07699
% Solids: 89.62

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	**0.10**		mg/kg dry	1	0.017	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	
Pyrene [129-00-0]^	**0.14**		mg/kg dry	1	0.018	0.039	7J28002	EPA 8270D	11/01/17 23:10	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.0*	*1*	*2.25*	*90 %*	*50-150*	*7J28002*	*EPA 8270D*	*11/01/17 23:10*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0015	U	mg/kg dry	2	0.0015	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
4,4'-DDE [72-55-9]^	0.0015	U	mg/kg dry	2	0.0015	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
4,4'-DDT [50-29-3]^	0.0015	U	mg/kg dry	2	0.0015	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0011	U	mg/kg dry	2	0.0011	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
alpha-BHC [319-84-6]^	0.0012	U	mg/kg dry	2	0.0012	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
beta-BHC [319-85-7]^	0.0022	U	mg/kg dry	2	0.0022	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Chlordane (tech) [12789-03-6]^	0.019	U	mg/kg dry	2	0.019	0.074	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Chlordane-alpha [5103-71-9]^	0.0010	U	mg/kg dry	2	0.0010	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Chlordane-gamma [5566-34-7]^	0.0010	U	mg/kg dry	2	0.0010	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
delta-BHC [319-86-8]^	0.0011	U	mg/kg dry	2	0.0011	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Dieldrin [60-57-1]^	0.0010	U	mg/kg dry	2	0.0010	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Endosulfan I [959-98-8]^	0.00087	U	mg/kg dry	2	0.00087	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Endosulfan II [33213-65-9]^	0.0011	U	mg/kg dry	2	0.0011	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0011	U	mg/kg dry	2	0.0011	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	QV-01
Endrin [72-20-8]^	0.0017	U	mg/kg dry	2	0.0017	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Endrin aldehyde [7421-93-4]^	0.0019	U	mg/kg dry	2	0.0019	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Endrin ketone [53494-70-5]^	0.0010	U	mg/kg dry	2	0.0010	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	QV-01
gamma-BHC [58-89-9]^	0.0013	U	mg/kg dry	2	0.0013	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Heptachlor [76-44-8]^	0.0014	U	mg/kg dry	2	0.0014	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0011	U	mg/kg dry	2	0.0011	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Isodrin [465-73-6]^	0.0014	U	mg/kg dry	2	0.0014	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Methoxychlor [72-43-5]^	0.0019	U	mg/kg dry	2	0.0019	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	QV-01
Mirex [2385-85-5]^	0.0025	U	mg/kg dry	2	0.0025	0.0038	7J31006	EPA 8081B	11/01/17 10:58	JJB	
Toxaphene [8001-35-2]^	0.038	U	mg/kg dry	2	0.038	0.074	7J31006	EPA 8081B	11/01/17 10:58	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.019*	*2*	*0.0373*	*50 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 10:58*	*JJB*	
Decachlorobiphenyl	*0.022*	*2*	*0.0373*	*58 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 10:58*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.016	U	mg/kg dry	1	0.016	0.019	7J31021	EPA 8082A	11/01/17 12:03	JJB	
PCB-1221 [11104-28-2]^	0.016	U	mg/kg dry	1	0.016	0.019	7J31021	EPA 8082A	11/01/17 12:03	JJB	
PCB-1232 [11141-16-5]^	0.016	U	mg/kg dry	1	0.016	0.019	7J31021	EPA 8082A	11/01/17 12:03	JJB	
PCB-1248 [12672-29-6]^	0.017	U	mg/kg dry	1	0.017	0.019	7J31021	EPA 8082A	11/01/17 12:03	JJB	
PCB-1254 [11097-69-1]^	**0.15**		mg/kg dry	1	0.018	0.019	7J31021	EPA 8082A	11/01/17 22:45	JJB	
PCB-1260 [11096-82-5]^	**0.096**		mg/kg dry	1	0.012	0.019	7J31021	EPA 8082A	11/01/17 12:03	JJB	

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ANALYTICAL RESULTS

Description: SB-5 (0-2') **Lab Sample ID:** AA07699-10 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 17:38 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 89.62

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.026*	*1*	*0.0366*	*72 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 12:03*	*JJB*	
Decachlorobiphenyl	*0.027*	*1*	*0.0366*	*74 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 12:03*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	**120**		mg/kg dry	1	3.8	6.4	7J30017	FL-PRO	11/03/17 21:27	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*2.8*	*1*	*3.73*	*74 %*	*60-118*	*7J30017*	*FL-PRO*	*11/03/17 21:27*	*JJB*	
o-Terphenyl	*2.0*	*1*	*1.87*	*105 %*	*62-109*	*7J30017*	*FL-PRO*	*11/03/17 21:27*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0483**		mg/kg dry	1	0.00396	0.0101	7J31036	EPA 7471B	11/02/17 09:34	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**3.34**		mg/kg dry	1	0.657	0.764	7J31001	EPA 6010C	11/01/17 11:33	ACV	
Barium [7440-39-3]^	**17.0**		mg/kg dry	1	0.0673	0.764	7J31001	EPA 6010C	11/01/17 11:33	ACV	
Cadmium [7440-43-9]^	**0.385**		mg/kg dry	1	0.0352	0.0764	7J31001	EPA 6010C	11/01/17 11:33	ACV	
Chromium [7440-47-3]^	**14.6**		mg/kg dry	1	0.245	0.764	7J31001	EPA 6010C	11/01/17 11:33	ACV	
Lead [7439-92-1]^	**13.7**		mg/kg dry	1	0.352	0.764	7J31001	EPA 6010C	11/01/17 11:33	ACV	
Selenium [7782-49-2]^	**3.52**		mg/kg dry	1	0.887	3.06	7J31001	EPA 6010C	11/01/17 11:33	ACV	
Silver [7440-22-4]^	0.0749	U	mg/kg dry	1	0.0749	0.764	7J31001	EPA 6010C	11/01/17 11:33	ACV	

ANALYTICAL RESULTS

Description: SB-5 (6-8')
Lab Sample ID: AA07699-11
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 17:44
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 76.42

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.00033	U	mg/kg dry	1	0.00033	0.00082	7K02019	EPA 8260B	11/02/17 19:36	KKW	
Ethylbenzene [100-41-4]^	0.00048	U	mg/kg dry	1	0.00048	0.00082	7K02019	EPA 8260B	11/02/17 19:36	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.00091	U	mg/kg dry	1	0.00091	0.0016	7K02019	EPA 8260B	11/02/17 19:36	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00052	U	mg/kg dry	1	0.00052	0.00082	7K02019	EPA 8260B	11/02/17 19:36	KKW	
o-Xylene [95-47-6]^	0.00046	U	mg/kg dry	1	0.00046	0.00082	7K02019	EPA 8260B	11/02/17 19:36	KKW	
Toluene [108-88-3]^	**0.0023**		mg/kg dry	1	0.00039	0.00082	7K02019	EPA 8260B	11/02/17 19:36	KKW	
Xylenes (Total) [1330-20-7]^	0.00082	U	mg/kg dry	1	0.00082	0.0016	7K02019	EPA 8260B	11/02/17 19:36	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.040*	*1*	*0.0412*	*97 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 19:36*	*KKW*	
Dibromofluoromethane	*0.043*	*1*	*0.0412*	*104 %*	*70-133*	*7K02019*	*EPA 8260B*	*11/02/17 19:36*	*KKW*	
Toluene-d8	*0.041*	*1*	*0.0412*	*100 %*	*70-130*	*7K02019*	*EPA 8260B*	*11/02/17 19:36*	*KKW*	

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	0.14	U	mg/kg dry	1	0.14	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
1,2-Dichlorobenzene [95-50-1]^	0.16	U	mg/kg dry	1	0.16	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
1,3-Dichlorobenzene [541-73-1]^	0.16	U	mg/kg dry	1	0.16	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
1,4-Dichlorobenzene [106-46-7]^	0.13	U	mg/kg dry	1	0.13	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2,4,5-Trichlorophenol [95-95-4]^	0.087	U	mg/kg dry	1	0.087	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2,4,6-Trichlorophenol [88-06-2]^	0.20	U	mg/kg dry	1	0.20	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2,4-Dichlorophenol [120-83-2]^	0.33	U	mg/kg dry	1	0.33	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2,4-Dimethylphenol [105-67-9]^	0.30	U	mg/kg dry	1	0.30	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2,4-Dinitrophenol [51-28-5]^	0.12	U	mg/kg dry	1	0.12	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2,4-Dinitrotoluene [121-14-2]^	0.21	U	mg/kg dry	1	0.21	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	QV-01
2,6-Dinitrotoluene [606-20-2]^	0.24	U	mg/kg dry	1	0.24	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2-Chloronaphthalene [91-58-7]^	0.13	U	mg/kg dry	1	0.13	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2-Chlorophenol [95-57-8]^	0.30	U	mg/kg dry	1	0.30	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2-Methyl-4,6-dinitrophenol [534-52-1]^	0.37	U	mg/kg dry	1	0.37	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2-Methylphenol [95-48-7]^	0.14	U	mg/kg dry	1	0.14	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2-Nitroaniline [88-74-4]^	0.11	U	mg/kg dry	1	0.11	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
2-Nitrophenol [88-75-5]^	0.34	U	mg/kg dry	1	0.34	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
3 & 4-Methylphenol [108-39-4/106-44-5]^	0.33	U	mg/kg dry	1	0.33	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
3,3'-Dichlorobenzidine [91-94-1]^	0.27	U	mg/kg dry	1	0.27	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
3-Nitroaniline [99-09-2]^	0.10	U	mg/kg dry	1	0.10	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
4-Bromophenyl-phenylether [101-55-3]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
4-Chloro-3-methylphenol [59-50-7]^	0.37	U	mg/kg dry	1	0.37	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
4-Chloroaniline [106-47-8]^	0.085	U	mg/kg dry	1	0.085	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
4-Chlorophenyl-phenylether [7005-72-3]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
4-Nitroaniline [100-01-6]^	0.34	U	mg/kg dry	1	0.34	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
4-Nitrophenol [100-02-7]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Benzidine [92-87-5]^	0.11	U	mg/kg dry	1	0.11	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	QV-01
Benzoic acid [65-85-0]^	0.63	U	mg/kg dry	1	0.63	2.2	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Benzyl alcohol [100-51-6]^	0.21	U	mg/kg dry	1	0.21	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Bis(2-chloroethoxy)methane [111-91-1]^	0.20	U	mg/kg dry	1	0.20	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Bis(2-chloroethyl)ether [111-44-4]^	0.18	U	mg/kg dry	1	0.18	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Bis(2-chloroisopropyl)ether [108-60-1]^	0.13	U	mg/kg dry	1	0.13	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	

ANALYTICAL RESULTS

Description: SB-5 (6-8')
Lab Sample ID: AA07699-11
Received: 10/27/17 08:00
Matrix: Soil
Sampled: 10/25/17 17:44
Work Order: AA07699
Project: Manatee County - Port Manatee
Sampled By: Sean Barnes
% Solids: 76.42

Semivolatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Bis(2-ethylhexyl)phthalate [117-81-7]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Butylbenzylphthalate [85-68-7]^	0.18	U	mg/kg dry	1	0.18	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Dibenzofuran [132-64-9]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Diethylphthalate [84-66-2]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Dimethylphthalate [131-11-3]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Di-n-butylphthalate [84-74-2]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Di-n-octylphthalate [117-84-0]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Hexachlorobenzene [118-74-1]^	0.16	U	mg/kg dry	1	0.16	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Hexachlorobutadiene [87-68-3]^	0.17	U	mg/kg dry	1	0.17	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Hexachlorocyclopentadiene [77-47-4]^	0.20	U	mg/kg dry	1	0.20	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Hexachloroethane [67-72-1]^	0.13	U	mg/kg dry	1	0.13	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Isophorone [78-59-1]^	0.22	U	mg/kg dry	1	0.22	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Nitrobenzene [98-95-3]^	0.20	U	mg/kg dry	1	0.20	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
N-Nitrosodimethylamine [62-75-9]^	0.16	U	mg/kg dry	1	0.16	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
N-Nitroso-di-n-propylamine [621-64-7]^	0.20	U	mg/kg dry	1	0.20	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	0.30	U	mg/kg dry	1	0.30	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Pentachlorophenol [87-86-5]^	0.27	U	mg/kg dry	1	0.27	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Phenol [108-95-2]^	0.13	U	mg/kg dry	1	0.13	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	
Pyridine [110-86-1]^	0.20	U	mg/kg dry	1	0.20	0.43	7J27021	EPA 8270D	11/01/17 16:46	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,6-Tribromophenol	*2.2*	*1*	*2.15*	*101 %*	*30-140*	*7J27021*	*EPA 8270D*	*11/01/17 16:46*	*jfi*	
2-Fluorobiphenyl	*1.8*	*1*	*2.15*	*82 %*	*55-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:46*	*jfi*	
2-Fluorophenol	*1.3*	*1*	*2.15*	*61 %*	*38-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:46*	*jfi*	
Nitrobenzene-d5	*1.2*	*1*	*2.15*	*56 %*	*45-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:46*	*jfi*	
Phenol-d5	*1.4*	*1*	*2.15*	*67 %*	*31-120*	*7J27021*	*EPA 8270D*	*11/01/17 16:46*	*jfi*	
Terphenyl-d14	*2.0*	*1*	*2.15*	*95 %*	*41-174*	*7J27021*	*EPA 8270D*	*11/01/17 16:46*	*jfi*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.025	U	mg/kg dry	1	0.025	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
2-Methylnaphthalene [91-57-6]^	0.024	U	mg/kg dry	1	0.024	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Acenaphthene [83-32-9]^	0.020	U	mg/kg dry	1	0.020	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Acenaphthylene [208-96-8]^	0.024	U	mg/kg dry	1	0.024	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Anthracene [120-12-7]^	0.018	U	mg/kg dry	1	0.018	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Benzo(a)anthracene [56-55-3]^	0.018	U	mg/kg dry	1	0.018	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Benzo(a)pyrene [50-32-8]^	0.020	U	mg/kg dry	1	0.020	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.022	U	mg/kg dry	1	0.022	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.020	U	mg/kg dry	1	0.020	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.025	U	mg/kg dry	1	0.025	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Chrysene [218-01-9]^	0.016	U	mg/kg dry	1	0.016	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.021	U	mg/kg dry	1	0.021	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Fluoranthene [206-44-0]^	0.022	U	mg/kg dry	1	0.022	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Fluorene [86-73-7]^	0.022	U	mg/kg dry	1	0.022	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.020	U	mg/kg dry	1	0.020	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Naphthalene [91-20-3]^	0.024	U	mg/kg dry	1	0.024	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	

ANALYTICAL RESULTS

Description: SB-5 (6-8') **Lab Sample ID:** AA07699-11 **Received:** 10/27/17 08:00

Matrix: Soil **Sampled:** 10/25/17 17:44 **Work Order:** AA07699

Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 76.42

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Phenanthrene [85-01-8]^	0.020	U	mg/kg dry	1	0.020	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	
Pyrene [129-00-0]^	0.021	U	mg/kg dry	1	0.021	0.046	7J28002	EPA 8270D	11/01/17 23:32	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.3*	*1*	*2.53*	*89 %*	*50-150*	*7J28002*	*EPA 8270D*	*11/01/17 23:32*	*jfi*	

Organochlorine Pesticides by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
4,4'-DDD [72-54-8]^	0.0017	U	mg/kg dry	2	0.0017	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
4,4'-DDE [72-55-9]^	0.0017	U	mg/kg dry	2	0.0017	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
4,4'-DDT [50-29-3]^	0.0017	U	mg/kg dry	2	0.0017	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	QL-02, QV-01
Aldrin [309-00-2]^	0.0013	U	mg/kg dry	2	0.0013	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
alpha-BHC [319-84-6]^	0.0015	U	mg/kg dry	2	0.0015	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
beta-BHC [319-85-7]^	0.0026	U	mg/kg dry	2	0.0026	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Chlordane (tech) [12789-03-6]^	0.022	U	mg/kg dry	2	0.022	0.086	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Chlordane-alpha [5103-71-9]^	0.0012	U	mg/kg dry	2	0.0012	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Chlordane-gamma [5566-34-7]^	0.0012	U	mg/kg dry	2	0.0012	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
delta-BHC [319-86-8]^	0.0013	U	mg/kg dry	2	0.0013	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Dieldrin [60-57-1]^	0.0012	U	mg/kg dry	2	0.0012	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Endosulfan I [959-98-8]^	0.0010	U	mg/kg dry	2	0.0010	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Endosulfan II [33213-65-9]^	0.0013	U	mg/kg dry	2	0.0013	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	QV-01
Endosulfan sulfate [1031-07-8]^	0.0013	U	mg/kg dry	2	0.0013	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	QV-01
Endrin [72-20-8]^	0.0019	U	mg/kg dry	2	0.0019	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Endrin aldehyde [7421-93-4]^	0.0022	U	mg/kg dry	2	0.0022	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Endrin ketone [53494-70-5]^	0.0012	U	mg/kg dry	2	0.0012	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	QV-01
gamma-BHC [58-89-9]^	0.0016	U	mg/kg dry	2	0.0016	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Heptachlor [76-44-8]^	0.0016	U	mg/kg dry	2	0.0016	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	QV-01
Heptachlor epoxide [1024-57-3]^	0.0013	U	mg/kg dry	2	0.0013	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Isodrin [465-73-6]^	0.0016	U	mg/kg dry	2	0.0016	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Methoxychlor [72-43-5]^	0.0023	U	mg/kg dry	2	0.0023	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	QV-01
Mirex [2385-85-5]^	0.0029	U	mg/kg dry	2	0.0029	0.0044	7J31006	EPA 8081B	11/01/17 11:11	JJB	
Toxaphene [8001-35-2]^	0.044	U	mg/kg dry	2	0.044	0.086	7J31006	EPA 8081B	11/01/17 11:11	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.044*	*2*	*0.0442*	*100 %*	*20-137*	*7J31006*	*EPA 8081B*	*11/01/17 11:11*	*JJB*	
Decachlorobiphenyl	*0.023*	*2*	*0.0442*	*52 %*	*13-183*	*7J31006*	*EPA 8081B*	*11/01/17 11:11*	*JJB*	

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
PCB-1016/1242 [12674-11-2/53469-21-9]^	0.018	U	mg/kg dry	1	0.018	0.022	7J31021	EPA 8082A	11/01/17 12:15	JJB	
PCB-1221 [11104-28-2]^	0.018	U	mg/kg dry	1	0.018	0.022	7J31021	EPA 8082A	11/01/17 12:15	JJB	
PCB-1232 [11141-16-5]^	0.018	U	mg/kg dry	1	0.018	0.022	7J31021	EPA 8082A	11/01/17 12:15	JJB	
PCB-1248 [12672-29-6]^	0.020	U	mg/kg dry	1	0.020	0.022	7J31021	EPA 8082A	11/01/17 12:15	JJB	
PCB-1254 [11097-69-1]^	0.021	U	mg/kg dry	1	0.021	0.022	7J31021	EPA 8082A	11/01/17 12:15	JJB	
PCB-1260 [11096-82-5]^	0.014	U	mg/kg dry	1	0.014	0.022	7J31021	EPA 8082A	11/01/17 12:15	JJB	

ANALYTICAL RESULTS

Description: SB-5 (6-8') **Lab Sample ID:** AA07699-11 **Received:** 10/27/17 08:00
Matrix: Soil **Sampled:** 10/25/17 17:44 **Work Order:** AA07699
Project: Manatee County - Port Manatee **Sampled By:** Sean Barnes **% Solids:** 76.42

Polychlorinated Biphenyls by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
2,4,5,6-TCMX	*0.031*	*1*	*0.0438*	*71 %*	*20-137*	*7J31021*	*EPA 8082A*	*11/01/17 12:15*	*JJB*	
Decachlorobiphenyl	*0.032*	*1*	*0.0438*	*72 %*	*13-183*	*7J31021*	*EPA 8082A*	*11/01/17 12:15*	*JJB*	

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	**85**		mg/kg dry	1	4.4	7.5	7J30017	FL-PRO	11/03/17 22:01	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*2.6*	*1*	*4.32*	*61 %*	*60-118*	*7J30017*	*FL-PRO*	*11/03/17 22:01*	*JJB*	
o-Terphenyl	*1.8*	*1*	*2.17*	*84 %*	*62-109*	*7J30017*	*FL-PRO*	*11/03/17 22:01*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**0.0229**		mg/kg dry	1	0.00510	0.0131	7J31036	EPA 7471B	11/02/17 09:38	EIC	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**4.93**		mg/kg dry	1	0.815	0.948	7J31001	EPA 6010C	11/01/17 11:38	ACV	
Barium [7440-39-3]^	**13.7**		mg/kg dry	1	0.0834	0.948	7J31001	EPA 6010C	11/01/17 11:38	ACV	
Cadmium [7440-43-9]^	**0.286**		mg/kg dry	1	0.0436	0.0948	7J31001	EPA 6010C	11/01/17 11:38	ACV	
Chromium [7440-47-3]^	**18.1**		mg/kg dry	1	0.303	0.948	7J31001	EPA 6010C	11/01/17 11:38	ACV	
Lead [7439-92-1]^	**0.808**	I	mg/kg dry	1	0.436	0.948	7J31001	EPA 6010C	11/01/17 11:38	ACV	
Selenium [7782-49-2]^	**6.71**		mg/kg dry	1	1.10	3.79	7J31001	EPA 6010C	11/01/17 11:38	ACV	
Silver [7440-22-4]^	**0.109**	I	mg/kg dry	1	0.0929	0.948	7J31001	EPA 6010C	11/01/17 11:38	ACV	

Description: TRIP BLANK **Lab Sample ID:** AA07699-12 **Received:** 10/27/17 08:00
Matrix: Water **Sampled:** 10/26/17 00:00 **Work Order:** AA07699
Project: Manatee County - Port Manatee **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K02015	EPA 8260B	11/02/17 11:42	NLM	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K02015	EPA 8260B	11/02/17 11:42	NLM	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K02015	EPA 8260B	11/02/17 11:42	NLM	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K02015	EPA 8260B	11/02/17 11:42	NLM	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K02015	EPA 8260B	11/02/17 11:42	NLM	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K02015	EPA 8260B	11/02/17 11:42	NLM	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K02015	EPA 8260B	11/02/17 11:42	NLM	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*50*	*1*	*50.0*	*100 %*	*41-142*	*7K02015*	*EPA 8260B*	*11/02/17 11:42*	*NLM*	
Dibromofluoromethane	*57*	*1*	*50.0*	*115 %*	*53-146*	*7K02015*	*EPA 8260B*	*11/02/17 11:42*	*NLM*	
Toluene-d8	*52*	*1*	*50.0*	*104 %*	*41-146*	*7K02015*	*EPA 8260B*	*11/02/17 11:42*	*NLM*	

ANALYTICAL RESULTS

Description: TRIP BLANK | **Lab Sample ID:** AA07699-13 | **Received:** 10/27/17 08:00

Matrix: Water | **Sampled:** 10/26/17 00:00 | **Work Order:** AA07699

Project: Manatee County - Port Manatee | **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K02015	EPA 8260B	11/02/17 12:11	NLM	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K02015	EPA 8260B	11/02/17 12:11	NLM	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K02015	EPA 8260B	11/02/17 12:11	NLM	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K02015	EPA 8260B	11/02/17 12:11	NLM	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K02015	EPA 8260B	11/02/17 12:11	NLM	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K02015	EPA 8260B	11/02/17 12:11	NLM	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K02015	EPA 8260B	11/02/17 12:11	NLM	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*103 %*	*41-142*	*7K02015*	*EPA 8260B*	*11/02/17 12:11*	*NLM*	
Dibromofluoromethane	*59*	*1*	*50.0*	*117 %*	*53-146*	*7K02015*	*EPA 8260B*	*11/02/17 12:11*	*NLM*	
Toluene-d8	*54*	*1*	*50.0*	*107 %*	*41-146*	*7K02015*	*EPA 8260B*	*11/02/17 12:11*	*NLM*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7K02015 - EPA 5030B_MS

Blank (7K02015-BLK1) Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 11:06

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.71	U	1.0	ug/L							
Ethylbenzene	0.69	U	1.0	ug/L							
m,p-Xylenes	1.3	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.60	U	1.0	ug/L							
o-Xylene	0.53	U	1.0	ug/L							
Toluene	0.72	U	1.0	ug/L							
Xylenes (Total)	1.3	U	2.0	ug/L							
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*104*	*41-142*			
Dibromofluoromethane	*58*			*ug/L*	*50.0*		*115*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

LCS (7K02015-BS1) Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 09:04

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	15		1.0	ug/L	20.0		77	56-136			
Toluene	17		1.0	ug/L	20.0		86	64-131			
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*106*	*41-142*			
Dibromofluoromethane	*54*			*ug/L*	*50.0*		*108*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*105*	*41-146*			

Matrix Spike (7K02015-MS1) Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 13:37

Source: AA07583-06

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	18		1.0	ug/L	20.0	0.71 U	90	56-136			
Toluene	19		1.0	ug/L	20.0	0.72 U	97	64-131			
4-Bromofluorobenzene	*49*			*ug/L*	*50.0*		*99*	*41-142*			
Dibromofluoromethane	*54*			*ug/L*	*50.0*		*109*	*53-146*			
Toluene-d8	*51*			*ug/L*	*50.0*		*102*	*41-146*			

Matrix Spike Dup (7K02015-MSD1) Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 14:06

Source: AA07583-06

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	18		1.0	ug/L	20.0	0.71 U	89	56-136	1	14	
Toluene	19		1.0	ug/L	20.0	0.72 U	95	64-131	2	16	
4-Bromofluorobenzene	*48*			*ug/L*	*50.0*		*97*	*41-142*			
Dibromofluoromethane	*54*			*ug/L*	*50.0*		*108*	*53-146*			
Toluene-d8	*51*			*ug/L*	*50.0*		*102*	*41-146*			

Batch 7K02019 - EPA 5035_MS

Blank (7K02019-BLK1) Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 12:25

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.00040	U	0.0010	mg/kg wet							
Ethylbenzene	0.00058	U	0.0010	mg/kg wet							
m,p-Xylenes	0.0011	U	0.0020	mg/kg wet							
Methyl-tert-Butyl Ether	0.00063	U	0.0010	mg/kg wet							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7K02019 - EPA 5035_MS - Continued

Blank (7K02019-BLK1) Continued Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 12:25

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	0.00056	U	0.0010	mg/kg wet							
Toluene	0.00047	U	0.0010	mg/kg wet							
Xylenes (Total)	0.00099	U	0.0020	mg/kg wet							
4-Bromofluorobenzene	*0.052*			*mg/kg wet*	*0.0500*		*104*	*70-130*			
Dibromofluoromethane	*0.047*			*mg/kg wet*	*0.0500*		*94*	*70-133*			
Toluene-d8	*0.050*			*mg/kg wet*	*0.0500*		*101*	*70-130*			

LCS (7K02019-BS1) Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 09:58

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.016		0.0010	mg/kg wet	0.0200		78	49-142			
Toluene	0.016		0.0010	mg/kg wet	0.0200		78	55-136			
4-Bromofluorobenzene	*0.051*			*mg/kg wet*	*0.0500*		*102*	*70-130*			
Dibromofluoromethane	*0.050*			*mg/kg wet*	*0.0500*		*99*	*70-133*			
Toluene-d8	*0.052*			*mg/kg wet*	*0.0500*		*104*	*70-130*			

LCS Dup (7K02019-BSD1) Prepared: 11/02/2017 00:00 Analyzed: 11/02/2017 10:27

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.016		0.0010	mg/kg wet	0.0200		80	49-142	3	19	QM-10
Toluene	0.015		0.0010	mg/kg wet	0.0200		76	55-136	3	21	QM-10
4-Bromofluorobenzene	*0.051*			*mg/kg wet*	*0.0500*		*103*	*70-130*			*QM-10*
Dibromofluoromethane	*0.049*			*mg/kg wet*	*0.0500*		*98*	*70-133*			*QM-10*
Toluene-d8	*0.052*			*mg/kg wet*	*0.0500*		*104*	*70-130*			*QM-10*

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27021 - SOP EXSV-33

Blank (7J27021-BLK1) Prepared: 10/27/2017 11:50 Analyzed: 10/30/2017 13:26

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	0.11	U	0.33	mg/kg wet							
1,2-Dichlorobenzene	0.12	U	0.33	mg/kg wet							
1,3-Dichlorobenzene	0.12	U	0.33	mg/kg wet							
1,4-Dichlorobenzene	0.10	U	0.33	mg/kg wet							
2,4,5-Trichlorophenol	0.067	U	0.33	mg/kg wet							
2,4,6-Trichlorophenol	0.15	U	0.33	mg/kg wet							
2,4-Dichlorophenol	0.25	U	0.33	mg/kg wet							
2,4-Dimethylphenol	0.23	U	0.33	mg/kg wet							
2,4-Dinitrophenol	0.089	U	0.33	mg/kg wet							
2,4-Dinitrotoluene	0.16	U	0.33	mg/kg wet							
2,6-Dinitrotoluene	0.18	U	0.33	mg/kg wet							
2-Chloronaphthalene	0.098	U	0.33	mg/kg wet							
2-Chlorophenol	0.23	U	0.33	mg/kg wet							
2-Methyl-4,6-dinitrophenol	0.28	U	0.33	mg/kg wet							
2-Methylphenol	0.11	U	0.33	mg/kg wet							
2-Nitroaniline	0.085	U	0.33	mg/kg wet							

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27021 - SOP EXSV-33 - Continued

Blank (7J27021-BLK1) Continued Prepared: 10/27/2017 11:50 Analyzed: 10/30/2017 13:26

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Nitrophenol	0.26	U	0.33	mg/kg wet							
3 & 4-Methylphenol	0.25	U	0.33	mg/kg wet							
3,3'-Dichlorobenzidine	0.21	U	0.33	mg/kg wet							
3-Nitroaniline	0.080	U	0.33	mg/kg wet							
4-Bromophenyl-phenylether	0.13	U	0.33	mg/kg wet							
4-Chloro-3-methylphenol	0.28	U	0.33	mg/kg wet							
4-Chloroaniline	0.065	U	0.33	mg/kg wet							
4-Chlorophenyl-phenylether	0.13	U	0.33	mg/kg wet							
4-Nitroaniline	0.26	U	0.33	mg/kg wet							
4-Nitrophenol	0.13	U	0.33	mg/kg wet							
Benzidine	0.086	U	0.33	mg/kg wet							
Benzoic acid	0.48	U	1.7	mg/kg wet							
Benzyl alcohol	0.16	U	0.33	mg/kg wet							
Bis(2-chloroethoxy)methane	0.15	U	0.33	mg/kg wet							
Bis(2-chloroethyl)ether	0.14	U	0.33	mg/kg wet							
Bis(2-chloroisopropyl)ether	0.099	U	0.33	mg/kg wet							
Bis(2-ethylhexyl)phthalate	0.13	U	0.33	mg/kg wet							
Butylbenzylphthalate	0.14	U	0.33	mg/kg wet							
Dibenzofuran	0.13	U	0.33	mg/kg wet							
Diethylphthalate	0.13	U	0.33	mg/kg wet							
Dimethylphthalate	0.13	U	0.33	mg/kg wet							
Di-n-butylphthalate	0.13	U	0.33	mg/kg wet							
Di-n-octylphthalate	0.13	U	0.33	mg/kg wet							
Hexachlorobenzene	0.12	U	0.33	mg/kg wet							
Hexachlorobutadiene	0.13	U	0.33	mg/kg wet							
Hexachlorocyclopentadiene	0.15	U	0.33	mg/kg wet							
Hexachloroethane	0.10	U	0.33	mg/kg wet							
Isophorone	0.17	U	0.33	mg/kg wet							
Nitrobenzene	0.15	U	0.33	mg/kg wet							
N-Nitrosodimethylamine	0.12	U	0.33	mg/kg wet							
N-Nitroso-di-n-propylamine	0.15	U	0.33	mg/kg wet							
N-nitrosodiphenylamine/Diphenylamine	0.23	U	0.33	mg/kg wet							
Pentachlorophenol	0.21	U	0.33	mg/kg wet							
Phenol	0.099	U	0.33	mg/kg wet							
Pyridine	0.15	U	0.33	mg/kg wet							
2,4,6-Tribromophenol	*1.4*			*mg/kg wet*	*1.67*		*87*	*30-140*			
2-Fluorobiphenyl	*1.4*			*mg/kg wet*	*1.67*		*83*	*55-120*			
2-Fluorophenol	*0.97*			*mg/kg wet*	*1.67*		*58*	*38-120*			
Nitrobenzene-d5	*0.98*			*mg/kg wet*	*1.67*		*59*	*45-120*			
Phenol-d5	*1.1*			*mg/kg wet*	*1.67*		*65*	*31-120*			
Terphenyl-d14	*1.7*			*mg/kg wet*	*1.67*		*103*	*41-174*			

LCS (7J27021-BS1) Prepared: 10/27/2017 11:50 Analyzed: 10/30/2017 13:57

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	1.2		0.33	mg/kg wet	1.67		74	35-123			
1,4-Dichlorobenzene	1.3		0.33	mg/kg wet	1.67		77	34-120			
2,4-Dinitrotoluene	2.0		0.33	mg/kg wet	1.67		118	42-136			
2-Chlorophenol	1.1		0.33	mg/kg wet	1.67		63	35-125			

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27021 - SOP EXSV-33 - Continued

LCS (7J27021-BS1) Continued Prepared: 10/27/2017 11:50 Analyzed: 10/30/2017 13:57

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4-Chloro-3-methylphenol	1.3		0.33	mg/kg wet	1.67		79	43-146			
4-Nitrophenol	1.4		0.33	mg/kg wet	1.67		84	24-212			
N-Nitroso-di-n-propylamine	1.6		0.33	mg/kg wet	1.67		94	43-150			
Pentachlorophenol	0.99		0.33	mg/kg wet	1.67		60	26-153			
Phenol	1.1		0.33	mg/kg wet	1.67		68	36-126			
2,4,6-Tribromophenol	*1.8*			*mg/kg wet*	*1.67*		*107*	*30-140*			
2-Fluorobiphenyl	*1.4*			*mg/kg wet*	*1.67*		*85*	*55-120*			
2-Fluorophenol	*0.94*			*mg/kg wet*	*1.67*		*56*	*38-120*			
Nitrobenzene-d5	*0.96*			*mg/kg wet*	*1.67*		*57*	*45-120*			
Phenol-d5	*1.1*			*mg/kg wet*	*1.67*		*66*	*31-120*			
Terphenyl-d14	*1.5*			*mg/kg wet*	*1.67*		*91*	*41-174*			

Matrix Spike (7J27021-MS1) Prepared: 10/27/2017 11:50 Analyzed: 10/30/2017 14:27

Source: AA07532-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	1.2		0.35	mg/kg dry	1.76	0.12 U	70	35-123			
1,4-Dichlorobenzene	1.3		0.35	mg/kg dry	1.76	0.11 U	72	34-120			
2,4-Dinitrotoluene	1.9		0.35	mg/kg dry	1.76	0.17 U	108	42-136			
2-Chlorophenol	1.1		0.35	mg/kg dry	1.76	0.25 U	62	35-125			
4-Chloro-3-methylphenol	1.3		0.35	mg/kg dry	1.76	0.30 U	74	43-146			
4-Nitrophenol	1.4		0.35	mg/kg dry	1.76	0.14 U	78	24-212			
N-Nitroso-di-n-propylamine	1.5		0.35	mg/kg dry	1.76	0.16 U	87	43-150			
Pentachlorophenol	1.0		0.35	mg/kg dry	1.76	0.22 U	58	26-153			
Phenol	1.1		0.35	mg/kg dry	1.76	0.11 U	65	36-126			
2,4,6-Tribromophenol	*1.6*			*mg/kg dry*	*1.76*		*93*	*30-140*			
2-Fluorobiphenyl	*1.4*			*mg/kg dry*	*1.76*		*79*	*55-120*			
2-Fluorophenol	*0.95*			*mg/kg dry*	*1.76*		*54*	*38-120*			
Nitrobenzene-d5	*0.92*			*mg/kg dry*	*1.76*		*52*	*45-120*			
Phenol-d5	*1.1*			*mg/kg dry*	*1.76*		*62*	*31-120*			
Terphenyl-d14	*1.4*			*mg/kg dry*	*1.76*		*80*	*41-174*			

Matrix Spike Dup (7J27021-MSD1) Prepared: 10/27/2017 11:50 Analyzed: 10/30/2017 14:57

Source: AA07532-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	1.2		0.35	mg/kg dry	1.79	0.12 U	67	35-123	2	32	
1,4-Dichlorobenzene	1.2		0.35	mg/kg dry	1.79	0.11 U	68	34-120	4	34	
2,4-Dinitrotoluene	2.0		0.35	mg/kg dry	1.79	0.17 U	111	42-136	4	16	
2-Chlorophenol	1.0		0.35	mg/kg dry	1.79	0.25 U	57	35-125	6	27	
4-Chloro-3-methylphenol	1.3		0.35	mg/kg dry	1.79	0.30 U	73	43-146	0.5	28	
4-Nitrophenol	1.4		0.35	mg/kg dry	1.79	0.14 U	78	24-212	2	35	
N-Nitroso-di-n-propylamine	1.5		0.35	mg/kg dry	1.79	0.16 U	85	43-150	0.03	24	
Pentachlorophenol	1.0		0.35	mg/kg dry	1.79	0.22 U	57	26-153	1	26	
Phenol	1.1		0.35	mg/kg dry	1.79	0.11 U	59	36-126	9	32	
2,4,6-Tribromophenol	*1.7*			*mg/kg dry*	*1.79*		*98*	*30-140*			
2-Fluorobiphenyl	*1.4*			*mg/kg dry*	*1.79*		*76*	*55-120*			
2-Fluorophenol	*0.90*			*mg/kg dry*	*1.79*		*51*	*38-120*			
Nitrobenzene-d5	*0.92*			*mg/kg dry*	*1.79*		*51*	*45-120*			
Phenol-d5	*1.0*			*mg/kg dry*	*1.79*		*57*	*31-120*			

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS - Quality Control

Batch 7J27021 - SOP EXSV-33 - Continued

Matrix Spike Dup (7J27021-MSD1) Continued Prepared: 10/27/2017 11:50 Analyzed: 10/30/2017 14:57

Source: AA07532-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Terphenyl-d14	*1.5*			*mg/kg dry*	*1.79*		*85*	*41-174*			

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J28002 - SOP EXSV-33

Blank (7J28002-BLK1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 17:58

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1-Methylnaphthalene	0.019	U	0.035	mg/kg wet							
2-Methylnaphthalene	0.018	U	0.035	mg/kg wet							
Acenaphthene	0.015	U	0.035	mg/kg wet							
Acenaphthylene	0.018	U	0.035	mg/kg wet							
Anthracene	0.014	U	0.035	mg/kg wet							
Benzo(a)anthracene	0.014	U	0.035	mg/kg wet							
Benzo(a)pyrene	0.015	U	0.035	mg/kg wet							
Benzo(b)fluoranthene	0.017	U	0.035	mg/kg wet							
Benzo(g,h,i)perylene	0.015	U	0.035	mg/kg wet							
Benzo(k)fluoranthene	0.019	U	0.035	mg/kg wet							
Chrysene	0.012	U	0.035	mg/kg wet							
Dibenzo(a,h)anthracene	0.016	U	0.035	mg/kg wet							
Fluoranthene	0.017	U	0.035	mg/kg wet							
Fluorene	0.017	U	0.035	mg/kg wet							
Indeno(1,2,3-cd)pyrene	0.015	U	0.035	mg/kg wet							
Naphthalene	0.018	U	0.035	mg/kg wet							
Phenanthrene	0.015	U	0.035	mg/kg wet							
Pyrene	0.016	U	0.035	mg/kg wet							
p-Terphenyl	*1.9*			*mg/kg wet*	*2.00*		*95*	*50-150*			

LCS (7J28002-BS1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 18:20

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	1.6		0.035	mg/kg wet	2.00		80	43-121			
Benzo(a)pyrene	1.8		0.035	mg/kg wet	2.00		88	58-120			
Benzo(g,h,i)perylene	1.7		0.035	mg/kg wet	2.00		84	58-124			
Naphthalene	1.7		0.035	mg/kg wet	2.00		83	37-120			
p-Terphenyl	*1.9*			*mg/kg wet*	*2.00*		*93*	*50-150*			

Matrix Spike (7J28002-MS1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 18:42

Source: AA07547-04

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	2.0		0.046	mg/kg dry	2.53	0.020 U	78	43-121			
Benzo(a)pyrene	2.2		0.046	mg/kg dry	2.53	0.020 U	88	58-120			
Benzo(g,h,i)perylene	2.1		0.046	mg/kg dry	2.53	0.026	82	58-124			
Naphthalene	2.5		0.046	mg/kg dry	2.53	0.023 U	98	37-120			
p-Terphenyl	*2.3*			*mg/kg dry*	*2.53*		*89*	*50-150*			

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J28002 - SOP EXSV-33 - Continued

Matrix Spike Dup (7J28002-MSD1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 19:04

Source: AA07547-04

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	1.9		0.046	mg/kg dry	2.58	0.020 U	72	43-121	6	30	
Benzo(a)pyrene	2.1		0.046	mg/kg dry	2.58	0.020 U	83	58-120	4	30	
Benzo(g,h,i)perylene	2.0		0.046	mg/kg dry	2.58	0.026	78	58-124	3	30	
Naphthalene	2.3		0.046	mg/kg dry	2.58	0.023 U	89	37-120	7	30	
p-Terphenyl	*2.2*			*mg/kg dry*	*2.58*		*86*	*50-150*			

Organochlorine Pesticides by GC - Quality Control

Batch 7J31006 - SOP EXSV-33

Blank (7J31006-BLK1) Prepared: 10/31/2017 10:32 Analyzed: 11/01/2017 08:16

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDD	0.00066	U	0.0017	mg/kg wet							
4,4'-DDE	0.00065	U	0.0017	mg/kg wet							
4,4'-DDT	0.00066	U	0.0017	mg/kg wet							
Aldrin	0.00051	U	0.0017	mg/kg wet							
alpha-BHC	0.00056	U	0.0017	mg/kg wet							
beta-BHC	0.0010	U	0.0017	mg/kg wet							
Chlordane (tech)	0.0084	U	0.033	mg/kg wet							
Chlordane-alpha	0.00045	U	0.0017	mg/kg wet							
Chlordane-gamma	0.00045	U	0.0017	mg/kg wet							
delta-BHC	0.00050	U	0.0017	mg/kg wet							
Dieldrin	0.00045	U	0.0017	mg/kg wet							
Endosulfan I	0.00039	U	0.0017	mg/kg wet							
Endosulfan II	0.00048	U	0.0017	mg/kg wet							
Endosulfan sulfate	0.00049	U	0.0017	mg/kg wet							
Endrin	0.00074	U	0.0017	mg/kg wet							
Endrin aldehyde	0.00083	U	0.0017	mg/kg wet							
Endrin ketone	0.00047	U	0.0017	mg/kg wet							
gamma-BHC	0.00060	U	0.0017	mg/kg wet							
Heptachlor	0.00062	U	0.0017	mg/kg wet							
Heptachlor epoxide	0.00048	U	0.0017	mg/kg wet							
Isodrin	0.00062	U	0.0017	mg/kg wet							
Methoxychlor	0.00086	U	0.0017	mg/kg wet							
Mirex	0.0011	U	0.0017	mg/kg wet							
Toxaphene	0.017	U	0.033	mg/kg wet							
2,4,5,6-TCMX	*0.025*			*mg/kg wet*	*0.0333*		*75*	*20-137*			
Decachlorobiphenyl	*0.030*			*mg/kg wet*	*0.0333*		*91*	*13-183*			

LCS (7J31006-BS1) Prepared: 10/31/2017 10:32 Analyzed: 11/01/2017 08:28

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDT	0.044		0.0017	mg/kg wet	0.0333		132	37-125			QL-02
Dieldrin	0.037		0.0017	mg/kg wet	0.0333		111	46-127			
Endrin	0.036		0.0017	mg/kg wet	0.0333		109	28-143			
2,4,5,6-TCMX	*0.032*			*mg/kg wet*	*0.0333*		*96*	*20-137*			
Decachlorobiphenyl	*0.040*			*mg/kg wet*	*0.0333*		*119*	*13-183*			

QUALITY CONTROL DATA

Organochlorine Pesticides by GC - Quality Control

Batch 7J31006 - SOP EXSV-33 - Continued

Matrix Spike (7J31006-MS1) Prepared: 10/31/2017 10:32 Analyzed: 11/01/2017 08:41

Source: AA07699-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDT	0.035		0.0040	mg/kg dry	0.0403	0.0016 U	88	37-125			
Dieldrin	0.031		0.0040	mg/kg dry	0.0403	0.0011 U	78	46-127			
Endrin	0.028		0.0040	mg/kg dry	0.0403	0.0018 U	70	28-143			
2,4,5,6-TCMX	*0.025*			*mg/kg dry*	*0.0403*		*62*	*20-137*			
Decachlorobiphenyl	*0.031*			*mg/kg dry*	*0.0403*		*76*	*13-183*			

Matrix Spike Dup (7J31006-MSD1) Prepared: 10/31/2017 10:32 Analyzed: 11/01/2017 08:53

Source: AA07699-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4,4'-DDT	0.042		0.0040	mg/kg dry	0.0400	0.0016 U	104	37-125	16	24	
Dieldrin	0.030		0.0040	mg/kg dry	0.0400	0.0011 U	76	46-127	3	21	
Endrin	0.030		0.0040	mg/kg dry	0.0400	0.0018 U	74	28-143	5	22	
2,4,5,6-TCMX	*0.025*			*mg/kg dry*	*0.0400*		*62*	*20-137*			
Decachlorobiphenyl	*0.034*			*mg/kg dry*	*0.0400*		*86*	*13-183*			

Polychlorinated Biphenyls by GC - Quality Control

Batch 7J31021 - EPA 3550C

Blank (7J31021-BLK1) Prepared: 10/31/2017 12:06 Analyzed: 11/01/2017 07:57

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	0.014	U	0.017	mg/kg wet							
PCB-1221	0.014	U	0.017	mg/kg wet							
PCB-1232	0.014	U	0.017	mg/kg wet							
PCB-1248	0.015	U	0.017	mg/kg wet							
PCB-1254	0.016	U	0.017	mg/kg wet							
PCB-1260	0.011	U	0.017	mg/kg wet							
2,4,5,6-TCMX	*0.029*			*mg/kg wet*	*0.0333*		*88*	*20-137*			
Decachlorobiphenyl	*0.031*			*mg/kg wet*	*0.0333*		*92*	*13-183*			

LCS (7J31021-BS1) Prepared: 10/31/2017 12:06 Analyzed: 11/01/2017 08:09

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	0.38		0.017	mg/kg wet	0.333		113	29-180			
PCB-1260	0.37		0.017	mg/kg wet	0.333		111	66-171			
2,4,5,6-TCMX	*0.038*			*mg/kg wet*	*0.0333*		*115*	*20-137*			
Decachlorobiphenyl	*0.041*			*mg/kg wet*	*0.0333*		*124*	*13-183*			

Matrix Spike (7J31021-MS1) Prepared: 10/31/2017 12:06 Analyzed: 11/01/2017 08:20

Source: AA07459-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	2.3	L	0.018	mg/kg dry	0.360	0.015 U	632	29-180			E, QM-07
PCB-1260	7.4	L	0.018	mg/kg dry	0.360	3.7	NR	66-171			QM-16, E
2,4,5,6-TCMX	*0.029*			*mg/kg dry*	*0.0360*		*81*	*20-137*			
Decachlorobiphenyl	*0.045*			*mg/kg dry*	*0.0360*		*125*	*13-183*			

QUALITY CONTROL DATA

Polychlorinated Biphenyls by GC - Quality Control

Batch 7J31021 - EPA 3550C - Continued

Matrix Spike Dup (7J31021-MSD1) Prepared: 10/31/2017 12:06 Analyzed: 11/01/2017 08:32

Source: AA07459-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
PCB-1016/1242	2.2	L	0.018	mg/kg dry	0.366	0.015 U	593	29-180	5	21	E, QM-07
PCB-1260	6.5	L	0.018	mg/kg dry	0.366	3.7	756	66-171	13	17	QM-16, E
2,4,5,6-TCMX	*0.033*			*mg/kg dry*	*0.0366*		*91*	*20-137*			
Decachlorobiphenyl	*0.061*			*mg/kg dry*	*0.0366*		*166*	*13-183*			

FL Petroleum Range Organics - Quality Control

Batch 7J30017 - SOP EXSV-33

Blank (7J30017-BLK1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 19:45

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	3.4	U	5.7	mg/kg wet							
n-Nonatriacontane	*2.2*			*mg/kg wet*	*3.33*		*66*	*60-118*			
o-Terphenyl	*1.3*			*mg/kg wet*	*1.67*		*75*	*62-109*			

LCS (7J30017-BS1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 20:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	37		5.7	mg/kg wet	56.7		65	63-153			
n-Nonatriacontane	*1.2*			*mg/kg wet*	*3.33*		*35*	*60-118*			*QS-03*
o-Terphenyl	*1.2*			*mg/kg wet*	*1.67*		*70*	*62-109*			

Matrix Spike (7J30017-MS1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 20:48

Source: AA07624-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	35		5.8	mg/kg dry	57.0	3.4 U	61	62-204			QM-07
n-Nonatriacontane	*1.3*			*mg/kg dry*	*3.35*		*38*	*60-118*			*QS-03*
o-Terphenyl	*1.1*			*mg/kg dry*	*1.68*		*67*	*62-109*			

Matrix Spike Dup (7J30017-MSD1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 21:19

Source: AA07624-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	38		5.8	mg/kg dry	56.8	3.4 U	67	62-204	9	25	
n-Nonatriacontane	*1.4*			*mg/kg dry*	*3.34*		*41*	*60-118*			*QS-03*
o-Terphenyl	*1.2*			*mg/kg dry*	*1.68*		*72*	*62-109*			

Batch 7K02020 - SOP EXSV-33

Blank (7K02020-BLK1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 07:34

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	3.4	U	5.7	mg/kg wet							
n-Nonatriacontane	*2.1*			*mg/kg wet*	*3.33*		*64*	*60-118*			
o-Terphenyl	*1.2*			*mg/kg wet*	*1.67*		*75*	*62-109*			

QUALITY CONTROL DATA

FL Petroleum Range Organics - Quality Control

Batch 7K02020 - SOP EXSV-33 - Continued

LCS (7K02020-BS1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 07:01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	37		5.7	mg/kg wet	56.7		65	63-153			
n-Nonatriacontane	*2.2*			*mg/kg wet*	*3.33*		*67*	*60-118*			
o-Terphenyl	*1.2*			*mg/kg wet*	*1.67*		*69*	*62-109*			

Matrix Spike (7K02020-MS1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 08:08

Source: AA07699-01RE1

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	49		6.8	mg/kg dry	66.7	4.0 U	73	62-204			
n-Nonatriacontane	*2.9*			*mg/kg dry*	*3.93*		*74*	*60-118*			
o-Terphenyl	*1.6*			*mg/kg dry*	*1.97*		*81*	*62-109*			

Matrix Spike Dup (7K02020-MSD1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 08:41

Source: AA07699-01RE1

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	55		6.8	mg/kg dry	67.4	4.0 U	81	62-204	12	25	
n-Nonatriacontane	*3.2*			*mg/kg dry*	*3.96*		*81*	*60-118*			
o-Terphenyl	*1.7*			*mg/kg dry*	*1.99*		*86*	*62-109*			

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 7J31036 - EPA 7471B

Blank (7J31036-BLK1) Prepared: 11/01/2017 11:15 Analyzed: 11/02/2017 08:30

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.00390	U	0.0100	mg/kg wet							

LCS (7J31036-BS1) Prepared: 11/01/2017 11:15 Analyzed: 11/02/2017 08:33

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.652		0.0100	mg/kg wet	0.600		109	80-120			

Matrix Spike (7J31036-MS1) Prepared: 11/01/2017 11:15 Analyzed: 11/02/2017 08:43

Source: AA07699-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.747		0.0108	mg/kg dry	0.649	0.0119	113	80-120			

Matrix Spike Dup (7J31036-MSD1) Prepared: 11/01/2017 11:15 Analyzed: 11/02/2017 08:47

Source: AA07699-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.806		0.0119	mg/kg dry	0.714	0.0119	111	80-120	8	20	

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 7J31001 - EPA 3050B

QUALITY CONTROL DATA

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 7J31001 - EPA 3050B - Continued

Blank (7J31001-BLK1) Prepared: 10/31/2017 09:18 Analyzed: 11/01/2017 10:52

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	0.589	U	0.685	mg/kg wet							
Barium	0.0603	U	0.685	mg/kg wet							
Cadmium	0.0315	U	0.0685	mg/kg wet							
Chromium	0.219	U	0.685	mg/kg wet							
Lead	0.315	U	0.685	mg/kg wet							
Selenium	0.795	U	2.74	mg/kg wet							
Silver	0.0671	U	0.685	mg/kg wet							

LCS (7J31001-BS1) Prepared: 10/31/2017 09:18 Analyzed: 11/01/2017 10:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	27.5		0.500	mg/kg wet	27.2		101	80-120			
Barium	28.5		0.500	mg/kg wet	27.2		105	80-120			
Cadmium	2.86		0.0500	mg/kg wet	2.72		105	80-120			
Chromium	28.3		0.500	mg/kg wet	27.2		104	80-120			
Lead	28.3		0.500	mg/kg wet	27.2		104	80-120			
Selenium	27.4		2.00	mg/kg wet	27.2		101	80-120			
Silver	5.49		0.500	mg/kg wet	5.43		101	80-120			

Matrix Spike (7J31001-MS1) Prepared: 10/31/2017 09:18 Analyzed: 11/01/2017 10:55

Source: BA04581-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	61.2		1.23	mg/kg dry	61.3	1.45	97	75-125			
Barium	66.8		1.23	mg/kg dry	61.3	7.75	96	75-125			
Cadmium	6.20		0.123	mg/kg dry	6.13	0.115	99	75-125			
Chromium	66.6		1.23	mg/kg dry	61.3	4.13	102	75-125			
Lead	65.6		1.23	mg/kg dry	61.3	5.76	98	75-125			
Selenium	61.1		4.91	mg/kg dry	61.3	1.42 U	100	75-125			
Silver	12.5		1.23	mg/kg dry	12.3	0.120 U	102	75-125			

Matrix Spike Dup (7J31001-MSD1) Prepared: 10/31/2017 09:18 Analyzed: 11/01/2017 11:00

Source: BA04581-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	60.8		1.16	mg/kg dry	57.9	1.45	102	75-125	0.7	30	
Barium	64.3		1.16	mg/kg dry	57.9	7.75	98	75-125	4	30	
Cadmium	6.02		0.116	mg/kg dry	5.79	0.115	102	75-125	3	30	
Chromium	65.0		1.16	mg/kg dry	57.9	4.13	105	75-125	2	30	
Lead	64.0		1.16	mg/kg dry	57.9	5.76	101	75-125	2	30	
Selenium	58.3		4.63	mg/kg dry	57.9	1.34 U	101	75-125	5	30	
Silver	12.0		1.16	mg/kg dry	11.6	0.114 U	103	75-125	4	30	

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*	Not reported due to interference.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate (CLP E-flag).
J-05	Result may be biased low. Associated calibration verification standard did not meet the minimum control limit.
QL-02	The associated laboratory control sample exhibited high bias; since the result is ND, there is no impact.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-10	LCS/LCSD were analyzed in place of MS/MSD.
QM-16	Matrix spike recovery could not be calculated due to high concentration of analyte in source sample.
QS-03	Surrogate recovery outside acceptance limits
QS-06	Surrogate recovery exceeded acceptance criteria due to the presence of a coeluting compound. This is a confirmed matrix effect.
QS-07	Surrogate recovery biased low due to matrix interference confirmed by re-extraction and/or re-analysis.
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

ENVIRONMENTAL CONSERVATION LABORATORIES — CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr. Orlando, FL 32824 (407) 826-5314 Fax (407) 850-6945
4810 Executive Park Court, Suite 111 Jacksonville, FL 32216-6069 (904) 296-3007 Fax (904) 296-6210
102-A Woodwinds Industrial Ct. Cary, NC 27511 (919) 467-3090 Fax (919) 467-3515
www.encolabs.com

Page 1 of 1

Client Name: PSI - Tampa (PS003)	Project Number: 05522421
Address: 5801 Benjamin Center Drive Suite 112	Project Name/Desc: Manatee County - Port Manatee
City/ST/Zip: Tampa, FL 33634	PO # / Billing Info: 0552421
Tel: (813) 886-1075 Fax: (813) 888-6514	Reporting Contact: Sean Barnes
Sampler(s) Name, Affiliation (Print): Sean Barnes PSI	Billing Contact: Sean Barnes
Sampler(s) Signature:	Site Location / Time Zone

Requested Analyses: 8260B Arom; 8270D PAH SIM; 8270D Full List; 8082A PCBs; 8081B Pests; RCRA8 Metals (Ag,As,Ba,Cd,Cr,Pb,Se,Hg); FLPRO

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

___ Standard

___ Expedited

Due ___/___/___

Lab Workorder: ~~AA07099~~ AA07481 KD

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)	Sample Comments
1	SB-1 (2-4')	10-25-17	11:16	Comp	So	6	X X X X X X X	10/27/17
2	SB-1 (4-6')		~~12:00~~					
3	SB-1 (6-8')		~~12:15~~					
4	SB-2 (2-4')		12:25					
5	SB-2 (6-8')		12:36					
6	SB-3 (2-4')		15:20					
7	SB-3 (6-8')		15:32					
8	SB-4 (2-4')		16:50					
9	SB-4 (6-8')		17:00					
10	SB-5 (0-2')		17:38					
11	SB-5 (6-8')		17:44					
12								

<-- Total # of Containers

Sample Kit Prepared By: ECG	Date/Time: 10/19/17 14:30	Relinquished By:	Date/Time: 10/19/17 14:30	Received By:	Date/Time: 10/20/17 9:00
Comments/Special Reporting Requirements:		Relinquished By:	Date/Time: 10-26-17 12:00	Received By:	Date/Time: 10/26/17 1200
		Relinquished By:	Date/Time: 10/26/17 1930	Received By:	Date/Time: 10/27/17 8:00
		Cooler #'s & Temps on Receipt: LG-355 0.4C° C-381 0.3C° LG-418 0.4C° LG-388 1.0C°		Condition Upon Receipt: Acceptable ___ Unacceptable	

Matrix : **GW**-Groundwater **SO**-Soil **DW**-Drinking Water **SE**-Sediment **SW**-Surface Water **WW**-Wastewater **A**-Air **O**-Other (detail in comments)

Preservation: **I**-Ice **H**-HCl **N**-HNO3 **S**-H2SO4 **NO**-NaOH **O**-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

ATTACHMENT D
PHOTOGRAPH LOG OF FIELD WORK

Photo 1: A view of the advancement of SB-1.

Photo 2: A view of the advancement of SB-2.

Photo 3: A view of the advancement of SB-3.

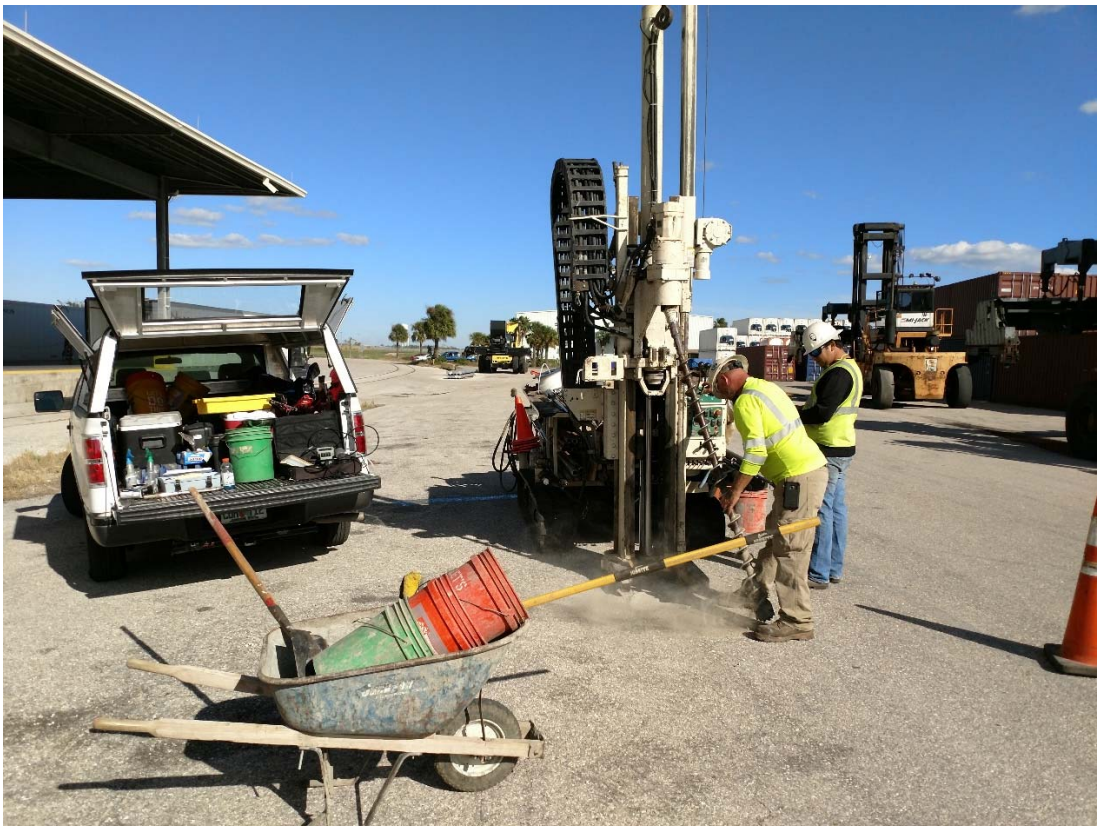

Photo 4: A view of the advancement of SB-4.

Photo 5: A view of the advancement of SB-5.

COMPLIANCE / ENGINEERING / REMEDIATION

LT Environmental, Inc.
6620 NW 38th Terrace
Gainesville, Florida 32653
T 352.371.1770 / F 352.371.6482

July 31, 2013

Mr. James M. Fillmore, P.E.
Florida Department of Environmental Protection
Mail Station 4585
Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Report of Activities (FP/H2S Survey)
Work Order 2013-95-W3197A
TransMontaigne Terminals LLC Port Manatee Terminal
804 North Dock Street
Palmetto, Florida Facility ID #418510770

Dear Mr. Fillmore:

LT Environmental, Inc. (LTE), on behalf of TransMontaigne Terminals LLC (TransMontaigne), is pleased to present for your approval the following report providing the results of the field work conducted at the above-referenced facility (Site) in accordance with Florida Department of Environmental Protection (FDEP) Work Order 2013-95-W3197A. The original scope of work for this project was presented to FDEP in the *Proposal to Inspect Remediation and Monitoring Wells and Measure Hydrogen Sulfide Concentrations* dated January 18, 2013.

The scope of work included: 1) collecting ambient air samples for hydrogen sulfide (H_2S) analysis; 2) inspecting and evaluating existing multi-phase extraction (MPE) wells, product recovery wells (RWs), and groundwater monitoring wells located on the TransMontaigne property and adjoining properties; 3) measuring hydrogen sulfide (H_2S) and total volatile organic compounds (VOCs) concentrations inside the well vault and top of casing of each well; and 4) measuring fluid levels (groundwater and free product, as applicable) in each well.

The area of investigation, the locations of the ambient air samples, and the locations of the wells included in this study are shown on Figure 1.

INVESTIGATION PROCEDURES

Ambient Air Sampling

Hydrogen sulfide (H_2S) was first identified in the study area in January 2004, when LTE personnel detected the characteristic odor of the gas while gauging fluid levels in newly-installed MPE wells. Site activities were suspended until appropriate air monitoring equipment arrived. The monitoring equipment subsequently detected H_2S in concentrations above the American Conference of Governmental Industrial Hygienists (ACGIH) and

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National Institute for Occupational Safety and Health (NIOSH) exposure limits. Based on these results, LTE modified the MPE system and the operation and maintenance and monitoring procedures and protocols to prevent exposure to potentially hazardous H_2S concentrations. The remediation system was operated from April 2004 to June 2008.

Since that time, H_2S odors have been reported by TransMontaigne personnel in the vicinity of monitoring wells, RWs, and MPE wells in and around the TransMontaigne property. Orange-colored iron stains caused by out-gassing of H_2S, have also formed on the ground surface, pavement, and wellhead protection structures around some of these wells. This raised the possibility that H_2S might accumulate in certain areas in concentrations potentially hazardous to human health. Ambient air sampling at select locations around the Site was performed to assess this possibility.

On May 22, 2013, LTE collected ambient air samples for H_2S analysis in accordance with NIOSH Method 6013. This method is recommended for area monitoring to determine human levels of exposure to H_2S in air to assure compliance with l Occupational Safety and Health Administration (OSHA) regulations. Four air samples were collected. Three of the sample locations were selected to assess the presence of H_2S in areas frequented by TransMontaigne personnel, and where H_2S odors have been detected. The fourth sample was a background sample located outside the main terminal property in an area where previous work indicated the absence of H_2S in the subsurface.

The sample numbers used for the ambient air samples refer to a unique number printed on the glass sample tubes. Sample No. 4914 was collected inside the ground-floor shop area of the Terminal office building (Site Photo 1**).** Sample No. 4917 was collected west of the terminal office building where the highest density of MPE wells is located (Site Photo 2). Sample No. 4919 was collected north of the terminal office building among Tanks 401 through 410 (Site Photo 3). Sample 4916 was a background sample collected to the east of the terminal office building inside the containment berm surrounding Tank 411 (Site Photo 4). The air sample locations are also plotted on Figure 1. Each sample was collected over a 24-minute period at a rate of 1.5 liters per minute, for a total sample volume of 36 liters. The samples were collected in the morning when there is typically less wind to disperse airborne contaminants.

Multi-Phase Extraction Wells

Fifty MPE wells, designated as PRW-1 through PRW-46 and PRW-97 through PRW-100, were installed at the Site in 2003. During an inspection of MPE wells PRW-4, PRW-5, and PRW-34 in August 2011, LTE observed that the vaults were partially to completely filled with standing water, and had an odor indicative of H_2S gas. All steel and iron components within the vaults and wells were extensively corroded. When LTE attempted to measure the fluid levels in the well casings, the well caps were found to be so degraded that efforts to remove the caps compromised the seal at the wellhead. Further inspections were postponed until replacement well caps and appropriate air monitoring equipment could be obtained.

LTE conducted a more complete field assessment of the MPE wells from May 20 through 24, 2013. All 50 MPE wells were located, but one well (PRW-4) was inaccessible as it was covered by a trailer that could not be moved within the time allocated for the inspection process. LTE personnel were equipped with ToxiRAE® Pro H_2S monitors for personal air monitoring, a MultiRAE® organic vapor meter (OVM) to measure H_2S and total volatile organic compounds (VOCs) inside the well vaults and top of casing, and a Solinst Model 122 oil/water interface probe to measure fluid levels in the wells.

The MPE wells are housed inside steel vaults with large, rectangular diamond-plate steel covers (Site Photo 5). Each vault accommodated a 4-inch diameter Schedule 40 polyvinyl chloride (PVC) well casing, 2-inch diameter Schedule 40 PVC and 2-inch diameter GEOFLEX® horizontal vapor and fluid recovery lines, plus a 1-inch diameter Bellowsflex® hose that leads from a valve on the fluid recovery line into the well casing through a compression cap at the well head (Site Photo 6).

Prior to removing the vault cover at each MPE well, LTE measured the H_2S concentration inside the vault by inserting the probe of the OVM through a small access panel in the vault cover. If the H_2S concentration in the vault exceeded the ACGIH Short Term Exposure Limit (STEL) of 5 parts per million (ppm), LTE personnel opened the vault and moved to a location upwind of the well until the gas dissipated. If there was no wind, LTE personnel used a fan to disperse the gases.

After determining that the H_2S concentration over the vault had stabilized below 5 ppm, LTE evacuated any standing water in the vault and visually inspected the vault, the valves on the horizontal lines, the GEOFLEX® tubing and Bellowsflex® hose, and the steel cap and gasket on the wellhead. Then, the well cap was loosened enough to insert the OVM probe inside the top of casing. After recording the H_2S and VOC concentrations, LTE removed the cap, pulled the Bellowsflex® hose from the well, and left the cap and hose coiled within the well vault.

After again determining the breathing zone atmosphere above the top of the well was safe, LTE used an oil/water interface probe to measure the depth to water and free product (if present). Then, the well was capped with a new J-plug to minimize extrusion of H_2S and

VOCs, and intrusion of water (Site Photo 7). Finally, the well vault cover was replaced. Photographs were taken of all wells inspected.

Product Recovery Wells

Twelve product RWs, designated RW-1 through RW-12, were installed at the Site in 1993 for a remediation system that operated for two years (Figure 1). The RWs were completed inside vaults similar in shape to the MPE wells, but smaller (Site Photo 8). Preliminary findings regarding the degraded conditions of the MPE wells in August 2011 suggested a need to also evaluate the condition of this group of wells. At that time, LTE observed that the steel vaults and covers of recovery wells RW-3 and RW-11 were damaged beyond repair and the standing water in the vault of RW-3 appeared to be percolating down through the well cap.

LTE conducted a more complete assessment of the RWs on May 24 and June 17, 2013. The same field equipment was used, and the same procedures were followed as described above for the MPE wells for opening the RW vaults and casings, measuring H_2S and VOC concentrations inside the well vaults and top of casing, and measuring fluid levels. Two of the 12 RWs, RW-8 and RW-9, were not found. It is likely that these wells were paved over during parking lot and driveway re-surfacing projects. An additional well, RW5-01, was identified on a map in the tank farm and found inside a 2-ft diameter PVC casing. RW5-01 is related to a free product recovery system that operated in the tank farm in the 1980s.

The RWs were constructed of 4-inch diameter PVC. In the past, the RW network and remediation system were interconnected by PVC piping. Inside the well vaults, the PVC piping was connected to the wells using flexible hoses. LTE's inspection confirmed that all of these hoses have been removed and the piping and wells capped with a threaded PVC fitting (Site Photo 9). In most cases the existing threaded PVC well cap was in good condition and could be replaced and tightened after fluid levels were measured. At two RWs, the head was damaged and a new J-plug was substituted to minimize extrusion of H_2S and VOCs, and intrusion of water (Site Photo 10).

Groundwater Monitoring Wells

Preliminary findings regarding the degraded conditions of the MPE and RW wells suggested a need to evaluate the condition of the larger number of groundwater monitoring wells at the Site. A total of 77 groundwater monitoring wells were identified from maps in previous reports submitted to the FDEP. The monitoring wells were installed during several different investigations conducted in the 1980s and 1990s as evidenced by the different naming systems.

LTE conducted an assessment of the monitoring wells from June 17 through 19, 2013. The same field equipment was used, and the same procedures were followed as described above for the MPE wells and RWs for opening the vaults and casings, measuring H_2S and VOC concentrations inside the well vaults and top of casing, and measuring fluid levels.

Of the 77 monitoring wells indicated on Figure 1, 57 were located and inspected. Most of the monitoring wells are completed with the wellhead inside a cylindrical metal vault with a bolt-down lid set in a concrete pad flush with the ground surface (flush-mount wells) (Site Photo 11). Fourteen monitoring wells are completed with the wellhead above ground surface inside a 4-inch square metal casing (stick-up wells) (Site Photo 12). The height of the stick-up is generally around 2 feet. Of the 20 wells not inspected, two were inaccessible (lid could not be removed due to corrosion and/or damage), three had been paved over (the surface expression was evident in the pavement), and 15 could not be found (referred to as missing wells). No un-mapped monitoring wells were discovered.

The procedure for searching for missing wells included a metal detector survey of the well location as indicated on maps in previous reports, probing or digging in areas that showed some response with the metal detector, and looking for any ground surface expression that might indicate a buried underground structure. This method allowed LTE to locate all buried MPE wells and RWs because they were large structures with large metal covers. It is likely that most or all of the missing monitoring wells have been damaged to the extent that the metal protective vault is completely gone and/or completely paved over, therefore preventing them from being located using these methods.

Some of the wells identified do not have a typical monitoring well appearance. For example, PW-1, PW-2, and PW-3 are 2-foot diameter pipes set vertically in the ground and intersecting the water table. Most of the monitoring wells are 2-inch in diameter. However, there are two 6-inch wells (MW5-26A and MW4-08), and three 1-inch wells (MW5-43, MW-5-42, and MW5-41).

INVESTIGATION RESULTS

H_2S Concentrations in Ambient Air

The laboratory report of analysis of the air samples is included in Appendix A. In Table 1, the results are compared to the ACGIH STEL (5 ppm) and NIOSH Exposure Limit of 10 ppm.. The highest concentration of H_2S detected during the ambient air study was 0.010 ppm in Sample 4914. All concentrations were well below the exposure limits cited.

General Well Conditions

Tables 2, 3, and 4 summarize the results of the field inspections of the MPE wells, the RW wells, and the groundwater monitoring wells, respectively. A CD with the photographs of the vaults and wells is included as Appendix B.

Table 2 summarizes the results of the inspections of the MPE wells. In general, the exterior and interior of the well vaults, the well caps, and valves (the metallic components), and the Bellowsflex® hoses and well cap gaskets (the rubber components) were in various stages of corrosion and in the poorest shape. Some were fairly intact, while others were highly

corroded, to the point of being un-useable. The GEOFLEX® tubing and the PVC well materials (the plastic components) were generally in good condition.

In well vaults with high H_2S concentrations, metallic, plastic, and rubber surfaces often had coatings of small crystals. On metallic surfaces, the crystals were generally orange-yellow in color, and presumably some kind of iron sulfide. On plastic and rubber surfaces the crystals had a more grayish tint.

Over half of the MPE well vaults contained some standing water. Depths from several inches to a foot of standing water were not uncommon. The presence of standing water seemed to be a contributing factor to the corrosion observed in the vaults.

Table 3 summarizes the results of LTE's evaluation of the RWs and vaults. The condition of the RW vaults ranged from poor to fair. Several vault covers were bent and damaged. The PVC well casing and well caps, however, were generally in good condition because the plastic is more resistant to corrosion from H_2S. The coatings of small crystals observed in the MPE wells were not as noticeable in the RWs because there were no rubber hoses and the only metallic surfaces were part of the well vault itself. Two of the RWs vaults (RW-3 and RW-5) contained measurable amounts of water (1.5 and 4 inches, respectively).

Table 4 presents the results of LTE's evaluation of the groundwater monitoring wells. In general, most of the wells were in relatively good shape. Exceptions included broken manhole covers, corrosion of wellhead protection structures, missing covers for the flush-mount and stick-up wells, and in some cases, corrosion of the metal stick-ups.

Free Product Distribution in the Subsurface

Tables 2, 3, and 4 present the free product thicknesses measured in the casings of the MPE wells, RWs, and monitoring wells, respectively. More than half (29) of the MPE wells had a measurable thickness of free product (Table 2). Thicknesses ranged from 0.1feet to 6.54 feet. Seven of the MPE wells had a product layer thickness greater than 3 feet. Six of the RWs inspected had measurable thicknesses of free product, ranging from 1.61feet to 4.86 feet (Table 3). Two RWs had free product thicknesses greater than 3 feet. Seventeen of the 57 monitoring wells inspected had a measurable thickness of free product, four of which had thicknesses greater than 3 feet (Table 4). Monitoring well MW4-23 had the greatest thickness of free product of any well in this study at 7.95 feet.

Figure 2 illustrates the areal extent of free product at the Site, and areas where the thickness is greatest. Thicknesses greater than 3 feet were generally found in the eastern part of Area 4, located west and southwest of the TransMontaigne terminal office building.

H_2S Concentrations in the Subsurface

H_2S concentrations were measured in the well vaults and inside the top of casing. However, the integrity and condition of the well vaults and well caps varied; therefore, some well vaults

were better ventilated than others and some well caps allowed H_2S vapor to escape from the wells more easily. Many of the groundwater monitoring wells had poorly fitting or missing covers or lids, allowing H_2S vapor to escape. Therefore, concentrations measured inside the top of casing of the securely capped wells seemed to be a better indicator of the extent of H_2S and VOCs at the Site than concentrations measured in the vaults.

Table 2 lists the H_2S readings from the vault and the top of casing of each of the MPE wells. Vault H_2S concentrations were generally low to below detectable levels, with only three exceeding 5 ppm. More than 80% of the MPE wells (41 wells) had measurable concentrations of H_2S in the top of casing. Nearly half (24 wells) had concentrations that were greater than 99 ppm, exceeding the capabilities of the OVM.

Table 3 lists the H_2S readings from the vault and the top of casing of each of the RWs. Only one RW well vault contained H_2S in a concentration greater than 5 ppm (RW-5). The lower concentrations of H_2S in the RW vaults relative to the MPE well vaults likely results from the better seal of the screw-on plastic well caps relative to the corroded compression caps of the MPE wells. Like the MPE wells, top of casing H_2S measurements in the RWs seemed to be a better indication of the extent of these gases in the subsurface than the well vault measurements. H_2S was detected in the air space in the top of the casing in six of the 10 recovery wells inspected, with readings greater than 99.9 ppm in three wells.

Table 4 lists the H_2S readings for each of the groundwater monitoring wells inspected. Only three monitoring well "vaults" or outer casings contained H_2S concentrations greater than 5 ppm, with only two of those producing concentrations greater than 99.9 ppm. The vaults of the monitoring wells are much smaller than the MPE wells and RWs. Like the MPE wells and RWs, H_2S concentrations in the top of casing seemed to be a better indication of the extent in the subsurface. H_2S was detected in the air space at the top of casing in 21 of the 57 wells inspected. Fourteen monitoring wells had H_2S concentrations greater than 99 ppm.

Figure 3 illustrates the areal extent of H_2S in the subsurface at the Site, based on H_2S measured in the air space at the top of the casing in the MPE wells, RWs, and groundwater monitoring wells. The figure shows those areas where H_2S concentrations in the well casing exceeded 10 ppm and those areas where the H_2S concentrations exceeded 99.9 ppm. Subsurface H_2S concentrations exceeding 99.9 ppm are concentrated in an area comprising the south end of the tank farm, the area surrounding the TransMontaigne office building, and the eastern part of Area 4 west and southwest of the office building.

VOC Concentrations in the Subsurface

VOC concentrations were also measured in the well vaults and inside the top of casing. As with the H_2S readings, the top of casing measurements were more indicative of the extent of VOCs in the subsurface at the Site.

Table 2 lists the VOC readings from the vault and the top of casing of each of the MPE wells. As with the H_2S concentrations, VOC concentrations in the vaults were generally low, with a

few exceptions. Measurable amounts of VOCs were found in 44 of the 49 MPE wells inspected, ranging in concentration from 0.1 to 478 ppm. Fifteen of the MPE wells had VOC concentrations greater than 100 ppm. .

Table 3 lists the VOC readings from the vault and the top of casing of each of the RWs . Concentrations of VOCs were below 0.6 ppm in all of the well vaults. VOCs were detected at the top of the casing of six of the RWs, with four wells producing concentrations greater than 100 ppm and one reading greater than 5,000 ppm (RW-3).

Table 4 lists the VOC readings for each of the groundwater monitoring wells inspected. Measurable amounts of VOCs were detected at the top of the casing in 27 of the 57groundwater monitoring wells inspected, ranging in concentration from 0.3 ppm to greater than 5,000 ppm. Concentrations greater than 100 ppm VOCs were detected in 13 of the wells.

Figure 4 illustrates the areal extent of VOCs at the Site (as measured in the air space at the top of casing), and the areas where the concentrations were highest. Like H_2S, the highest VOC concentrations are generally found in the south end of the tank farm, the area surrounding the TransMontaigne office building, and the area west and southwest of the office building.

CONCLUSIONS AND RECOMMENDATIONS

The survey indicates a large volume of free product still remains under the western portion of the TransMontaigne Port Manatee Terminal and extends into Area 4. Comparison of Figures 2, 3, and 4 indicates that there is a high degree of correlation at the Site between the distribution of free product at the saturated zone and subsurface VOCs and H_2S concentrations. The petroleum hydrocarbons combined with the organic-rich fill material comprising the saturated zone soils have created highly reducing conditions favorable for the generation and accumulation of H_2S at very high concentrations.

LTE recommends resumption of remedial actions designed to remove the free product, VOCs, and H2S. The existing remediation system should be evaluated as to whether it can be placed back into service. All of the MPE wells are in useable condition; however, all will need some degree of repair work before remedial actions are resumed (Table 2). Repairs include replacing degraded vaults, caps, valves, Bellowsflex® hoses, and/or GEOFLEX® tubing. Materials less susceptible to corrosion should be considered for replacement parts. The PVC well casings were generally good and will not need to be replaced. Provisions to drain the well vaults should be part of any plan to restore the MPE wells to operation.

RWs can be repaired and returned to service as product RWs, or they can be used as monitoring wells (Table 3). The PVC well casings are generally good and do not need to be replaced. If the RWs are to be placed back in service as product RWs, the caps, valves, hoses, and tubing will have to be replaced. The vaults surrounding the majority of the RWs will also have to be replaced. Materials less susceptible to corrosion should be considered for replacement parts. Provisions to drain the RW vaults should be part of any plan to restore these wells to operation.

Table 4 presents the recommendations for the groundwater monitoring wells. Most of the groundwater monitoring wells are useable; however, many require minor repairs, including installation of protective casings and replacement of vault covers. Several wells are silted in and should be flushed out.

The results of this investigation demonstrate that potentially hazardous or life-threatening H_2S concentrations can be encountered in any closed structure where vapors from the subsurface may accumulate. Therefore, all future site activities, including well repair and maintenance, must be conducted in accordance with OSHA requirements to prevent exposure. During repair operations, workers will need to take the same health and safety precautions and procedures as implemented for this investigation, including equipping themselves with H_2S monitors for personal air monitoring, and an OVM to measure H_2S and VOCs in structures and in the breathing zone. Because of the prolonged contact with the vaults and open wells during repairs, personnel may need to wear self-contained breathing apparatus while working on some of the MPE and RW wells.

When remedial actions are resumed, a very high potential for accumulation of H_2S within the MPE wells, system piping, and vessels at concentrations that exceed the Immediate Danger to Life and Health (IDLH) concentration of 100 ppm, will be likely. The current system design and equipment will be evaluated for adequacy to capture and treat the expected H_2S volume, and the system will be re-designed or upgraded as necessary. In addition, the system operation and maintenance procedures will emphasize the hazards to equipment and personnel safety posed by the presence of H_2S and the procedures and equipment to in place to mitigate them.

Ambient air monitoring showed concentrations of H_2S to be well below STELs. No further ambient air sampling activities are recommended at this time. Ambient air monitoring should be conducted again when the remediation system is reactivated.

LTE and TransMontaigne thank you for giving us the opportunity to evaluate the current subsurface conditions at this Site. Please call me at 352-371-1770 to discuss remediation options and the path forward.

Sincerely,

LT ENVIRONMENTAL, INC.

Keith Pollman, P.G.
Senior Hydrogeologist
cc: Mr. J. Douglas Hall, P.G., TransMontaigne Terminals LLC, Denver, CO

Attachments

P.G. CERTIFICATION

I hereby certify that I have supervised the field work described above and preparation of this report in accordance with Florida Rules and Regulations. As a registered professional geologist, as authorized by Chapter 492, Florida Statutes, I certify that I am a qualified groundwater professional, with knowledge and experience in soil and groundwater contamination assessment and cleanup. To the best of my knowledge, the information and laboratory data presented in this report (including the applicable attachments) are true, accurate, complete, and in accordance with applicable State Rules and Regulations.

Keith S. Pollman, Florida Professional Geologist #2059

PHOTOGRAPHS

Photo 1: Ambient air monitoring station No. 1 (Sample 4914).

Photo 2: Ambient air monitoring station No. 2 (Sample 4917)

Photo 3: Ambient air monitoring station No. 3 (Sample 4919).

Photo 4: Ambient air monitoring station No. 4 (Sample 4916).

Photo 5: Example vault exterior for an MPE well (PRW-25).

Site Photo 6: Example vault interior for MPE well components (PRW-25).

Site Photo 7: MPE well PRW-25 with Bellowsflex hose removed and new J-plug installed.

Site Photo 8: Product recovery well RW-2 surface expression.

Site Photo 9: Product recovery well RW-4 with screw-on plastic well cap.

Site Photo 10: Product recovery well RW-3 with J-plug replacing original cap

Site Photo 11: Flush-mount monitoring well MW5-02.

Site Photo 12: Stick-up monitoring well MW4-02.

FIGURES

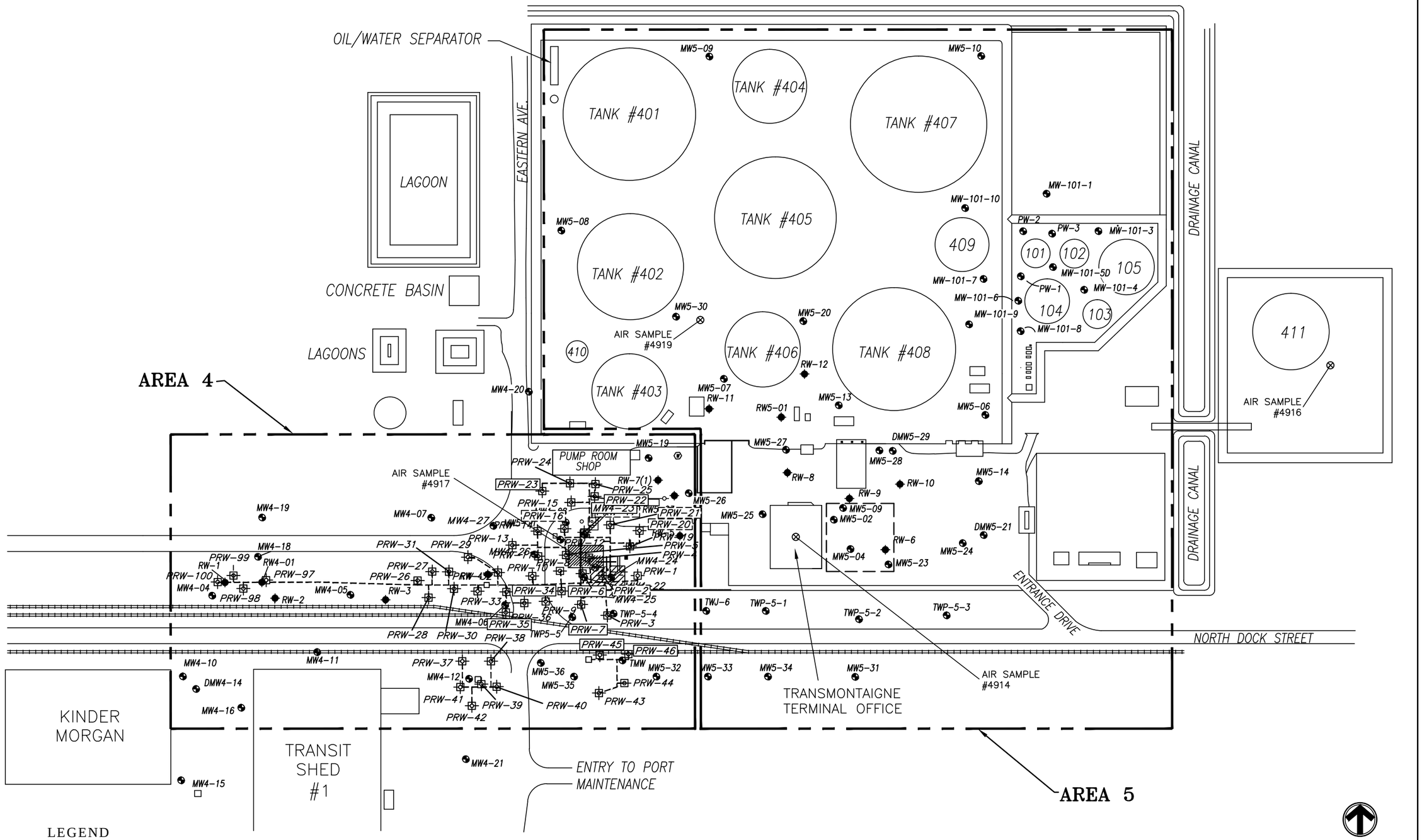
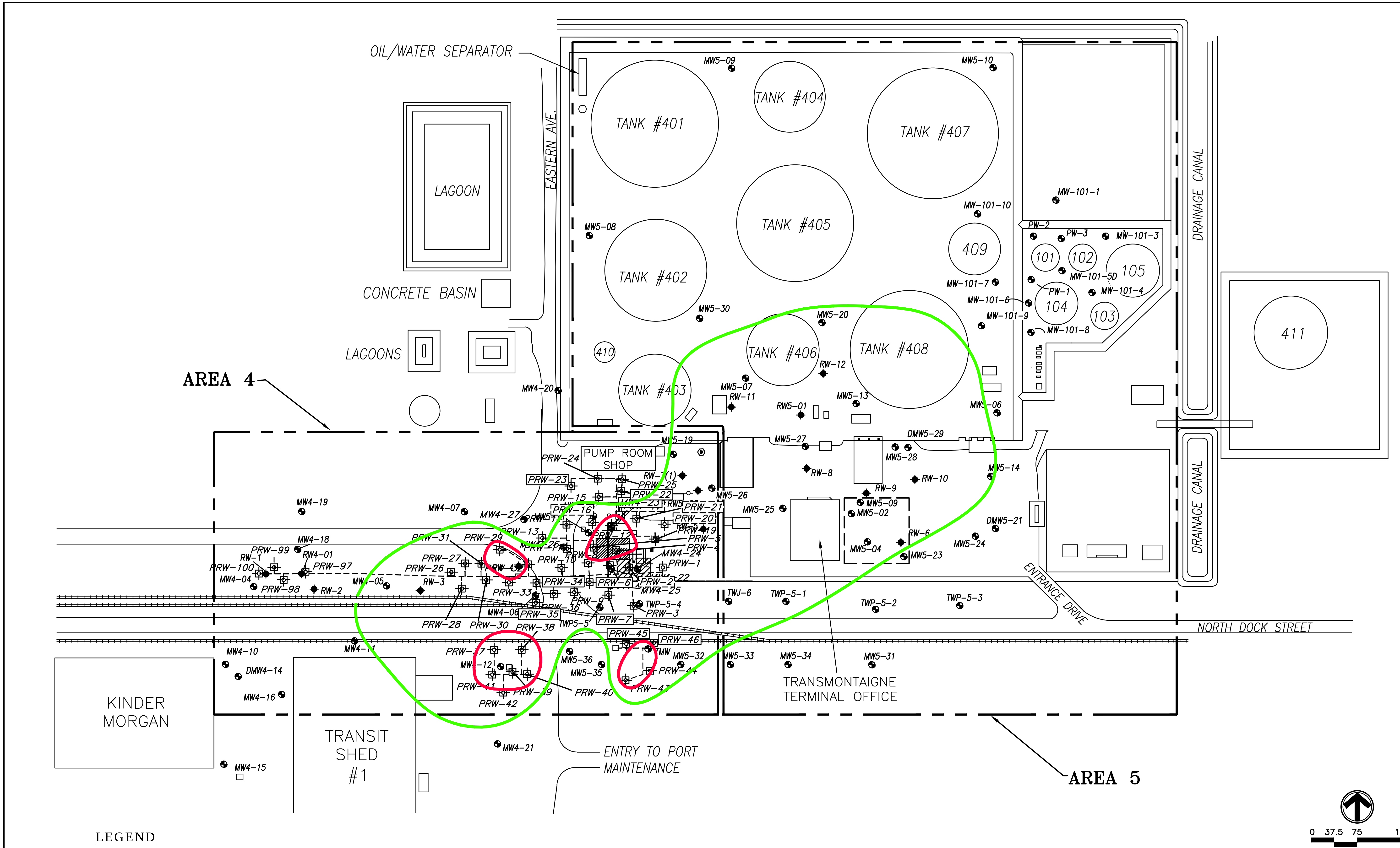


FIGURE 1
SITE MAP
TRANSMONTAIGNE PORT MANATEE TERMINAL
PALMETTO, FLORIDA

2013\0116-11001 01 7/13



OIL/WATER SEPARATOR
LAGOON
CONCRETE BASIN
LAGOONS
EASTERN AVE.
TANK #401
TANK #402
TANK #403
TANK #404
TANK #405
TANK #406
TANK #407
TANK #408
409
410
411
101
102
103
104
105
AREA 4
AREA 5
PUMP ROOM SHOP
DRAINAGE CANAL
DRAINAGE CANAL
ENTRANCE DRIVE
NORTH DOCK STREET
KINDER MORGAN
TRANSIT SHED #1
TRANSMONTAIGNE TERMINAL OFFICE
ENTRY TO PORT MAINTENANCE
MW5-09
MW5-10
MW-101-1
MW-101-10
PW-2
PW-3
MW-101-3
MW-101-5D
MW-101-7
MW-101-6
MW-101-4
PW-1
MW-101-9
MW-101-8
MW5-08
MW5-30
MW5-20
RW-12
MW5-07
RW-11
RW5-01
MW5-13
MW5-06
MW4-20
MW5-19
MW5-27
DMW5-29
MW5-28
RW-8
RW-10
MW5-14
RW-9
MW5-26
MW5-25
MW5-02
RW-6
MW5-04
MW5-23
MW5-24
DMW5-21
PRW-24
PRW-23
PRW-25
PRW-22
PRW-15
PRW-16
PRW-21
PRW-20
PRW-19
PRW-13
PRW-5
PRW-4
PRW-1
PRW-31
PRW-29
PRW-27
PRW-26
PRW-10
MW4-24
MW4-19
MW4-07
MW4-27
MW4-18
PRW-99
RW-1
RW4-01
PRW-97
PRW-100
MW4-04
PRW-98
RW-2
RW-3
PRW-34
PRW-6
PRW-2
MW4-25
PRW-33
PRW-9
TWP-5-4
PRW-3
MW4-06
PRW-35
TWP5-5
PRW-7
TWJ-6
TWP-5-1
TWP-5-2
TWP-5-3
PRW-28
PRW-30
PRW-38
PRW-45
PRW-46
MW4-10
MW5-36
MW5-35
MW5-32
PRW-44
MW5-33
MW5-34
MW5-31
DMW4-14
MW4-12
PRW-41
PRW-39
PRW-40
PRW-43
PRW-42
MW4-16
MW4-21
MW4-15
0 37.5 75 150
FEET

LEGEND

- MONITORING WELL
- SOIL BORING
- RECOVERY WELL
- WATER SUPPLY WELL
- FREE PRODUCT THICKNESS >0.01 FEET
- FREE PRODUCT THICKNESS ≥3 FEET

REFERENCE; ELS BASE MAP

FIGURE 2
FREE PRODUCT PLUME
TRANSMONTAIGNE PORT MANATEE TERMINAL
PALMETTO, FLORIDA

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LEGEND

- MONITORING WELL
- SOIL BORING
- RECOVERY WELL
- WATER SUPPLY WELL

HYDROGEN SULFIDE CONCENTRATION ≥10 PPM

HYDROGEN SULFIDE CONCENTRATION ≥99.9 PPM

PPM PARTS PER MILLION

REFERENCE; ELS BASE MAP

FIGURE 3
HYDROGEN SULFIDE EXTENT
TRANSMONTAIGNE PORT MANATEE TERMINAL
PALMETTO, FLORIDA

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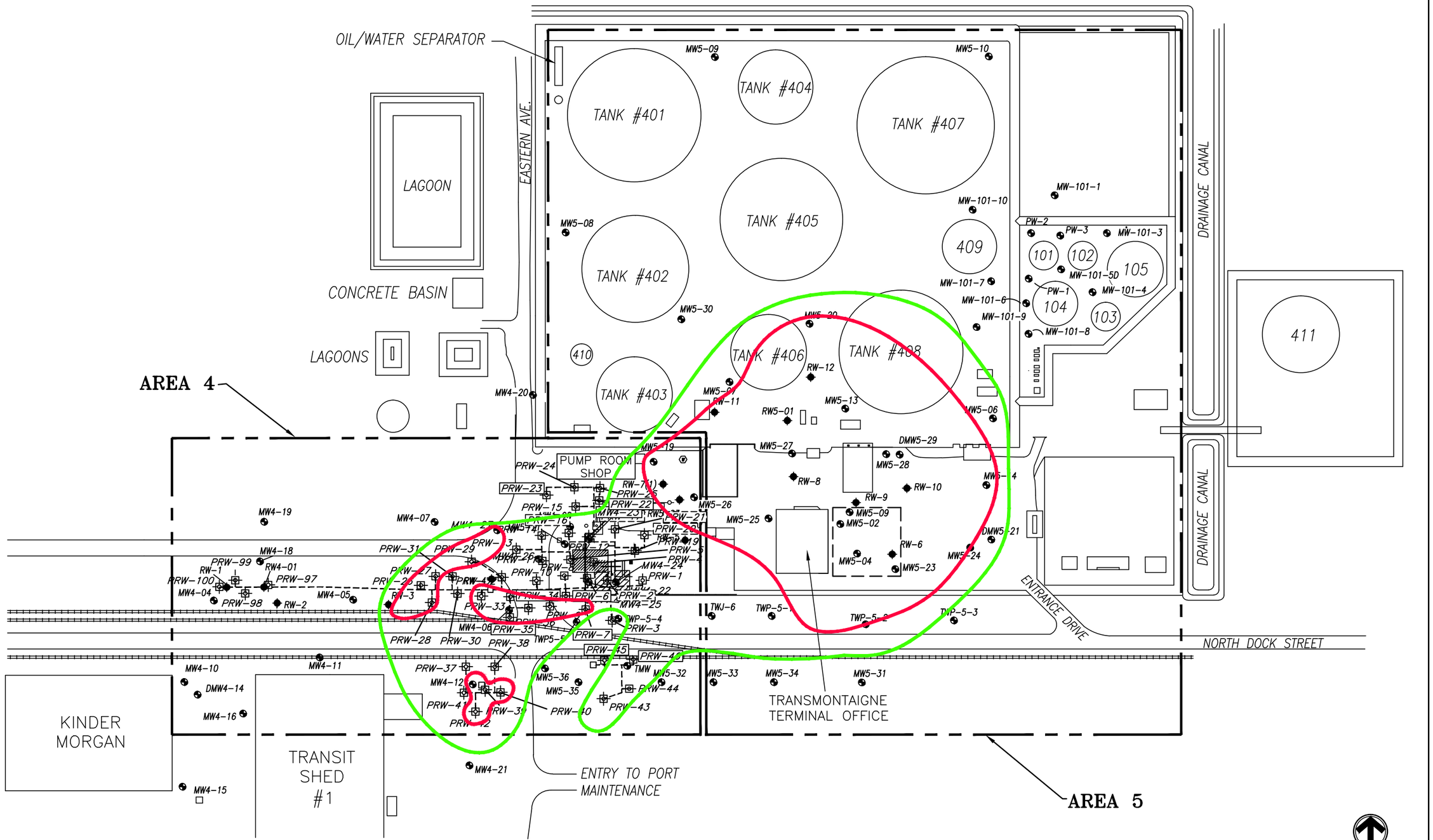

LEGEND

- MONITORING WELL
- SOIL BORING
- RECOVERY WELL
- WATER SUPPLY WELL

TOTAL ORGANIC VAPOR CONCENTRATION ≥50 PPM

TOTAL ORGANIC VAPOR CONCENTRATION ≥100 PPM

PPM PARTS PER MILLION

0 37.5 75 150

FEET

REFERENCE; ELS BASE MAP

FIGURE 4
TOTAL ORGANIC VAPOR CONCENTRATIONS
TRANSMONTAIGNE PORT MANATEE TERMINAL
PALMETTO, FLORIDA

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TABLES

TABLE 1

HYDROGEN SULFIDE CONCENTRATIONS IN AMBIENT AIR SAMPLES, MAY 2013

TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

	Sample ID			
	4914	4916	4917	4919
Location	Inside ground-floor shop area of TransMontaigne Terminal office building	Background sample collected near Tank 411 to the east of the TransMontaigne Terminal office building	West of TransMontaigne Terminal office building where highest density of MPE wells is located	In tank farm among Tanks 401-410 north of the TransMontaigne Terminal office building
Hydrogen Sulfide Concentration (ppm)	0.010	0.0047	<0.0035	<0.0035
STEL (ppm)	5			
NIOSH Exposure Limit (ppm)	10			

Notes:
All concentrations in parts per million (ppm)
STEL: Short-term exposure limit recommended by the American Conference of Governmental Industrial Hygienists.
NIOSH: National Institute for Occupational Safety and Health.

TABLE 2
MULTI-PHASE EXTRACTION WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Geoflex Tubing	Bellowsflex Hose	Water in Vault (in)	Comments	Recommendations
PRW-1	5/20/13	48.7	0	9.2	11.97	2.77	183	14.6	fair	good	poor	poor	missing	poor	0	Cap corroded, hose brittle.	Replace cap, valves, tubing, and hose. Consider attaching warning placard.
PRW-2	5/23/13	4.4	0.5	NP	9.35	0	>73	>99.9	poor	fair	poor	poor	fair	poor	< 1	Vault, cap, and valves heavily corroded, hose brittle.	Replace vault, cap, valves, and hose. Consider attaching warning placard.
PRW-3	5/22/13	0.5	0	NP	1.32	0	3	0.9	fair	fair	poor	poor	fair	poor	7.5	Cap and valves heavily corroded, hose brittle	Replace vault, cap, valves, and hose.
PRW-4	Not evaluated at this time															Trailer parked on well vault. Could not move.	Based on location, will probably need significant repairs and a warning placard.
PRW-5	5/20/13	2.1	3.3	8.7	9.95	1.25	197.6	>99.9	poor	fair	poor	poor	fair	poor	2	Vault, cap, and valves heavily corroded.	Replace vault, cap, valves, and hose. Consider attaching warning placard.
PRW-6	5/21/13	3	1.2	NP	7.65	0	0.4	0.3	fair	good	fair	fair	fair	fair	0	Cap and valves corroded, hose brittle.	Replace cap, valves, and hose.
PRW-7	5/22/13	1.1	0.1	5.37	6.02	0.65	199.3	>99.9	fair	fair	poor	poor	fair	poor	6.5	Cap and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.

TABLE 2
MULTI-PHASE EXTRACTION WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Geoflex Tubing	Bellowsflex Hose	Water in Vault (in)	Comments	Recommendations
PRW-8	5/21/13	7.9	0	8.97	10.41	1.44	29.2	28	fair	good	fair	poor	fair	poor	1.5	Grass in southwest corner	Replace vault, cap, valves, and hose. Consider attaching warning placard.
PRW-9	5/22/13	0	0	6.95	7.05	0.1	106.6	>99.9	fair	good	poor	poor	fair	poor	7	Cap and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-10	5/22/13	0.3	0.2	7.02	12.94	5.92	39.8	>99.9	fair	good	poor	poor	fair	poor	0	Cap corroded, valve stuck, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-11	5/21/13	0.3	0	8.37	9.98	1.61	>70	>99.9	fair	good	poor	fair	fair	fair	0	Cap heavily corroded	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-12	5/21/13	0.8	0.2	9.38	9.9	0.52	105	>99.9	fair	good	poor	poor	good	poor	0	Cap corroded, valve stuck, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-13	5/23/13	0	0	NP	8.98	0	2.5	5.3	fair	fair	poor	poor	fair	poor	6	Located in road, heavy steel plate used for cover b/c of traffic.	Replace cap, valves, and hose.
PRW-14	5/21/13	0.8	0	8.09	8.29	0.2	80.4	>99.9	good	good	fair	fair	good	fair	0	Well in good shape relative to the rest.	Replace cap and hose. Consider attaching warning placard.
PRW-15	5/21/13	0	0	NP	10.17	0	0	0	good	good	poor	fair	good	fair	0	Cap corroded. Mislabeled on map as PRW-23.	Replace cap, valves, and hose.

TABLE 2
MULTI-PHASE EXTRACTION WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Geoflex Tubing	Bellowsflex Hose	Water in Vault (in)	Comments	Recommendations
PRW-16	5/21/13	0	0	NP	9.69	0	282	>99.9	fair	good	fair	fair	good	fair	0	Well in good shape relative to the rest.	Replace cap and hose. Consider attaching warning placard.
PRW-17	5/20/13	0	0	10.4	10.47	0.07	11	>99.9	fair	good	poor	fair	good	fair	0	Cap and valves corroded.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-18	5/21/13	24.6	65.7	NP	10.38	0	95.8	>99.9	poor	good	poor	poor	fair	poor	3	Vault, cap, and valves heavily corroded, hose brittle.	Replace vault, cap, valves, and hose. Consider attaching warning placard.
PRW-19	5/20/13	0.4	0.6	NP	9.88	0	0.1	1.2	fair	good	fair	fair	fair	poor	0	Cap and hose connection corroded.	Replace cap, valves, and hose.
PRW-20	5/20/13	1.8	0.6	NP	10.3	0	0.4	1.7	fair	good	fair	fair	good	fair	0	Well in good shape relative to the rest.	Replace cap, valves, and hose.
PRW-21	5/20/13	1.9	0	NP	10.5	0	0	0	fair	good	fair	fair	good	fair	0	Well in good shape relative to the rest.	Replace vault, cap, valves, and hose.
PRW-22	5/20/13	10.1	0	NP	10.53	0	16	0	poor	poor	very poor	poor	fair	poor	0	Vault and cap heavily corroded, valves corroded, hose brittle.	Replace vault, cap, valves, and hose.
PRW-23	5/21/13	0	0	NP	8.85	0	3.1	0	fair	good	poor	poor	fair	poor	13	Cap and valves corroded, hose brittle.	Replace vault, cap, valves, and hose.

TABLE 2
MULTI-PHASE EXTRACTION WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Geoflex Tubing	Bellowsflex Hose	Water in Vault (in)	Comments	Recommendations
PRW-24	5/20/13	0	0	NP	10.67	0	0	0	fair	good	fair	fair	good	fair	<1	Well in good shape relative to the rest.	Replace vault, cap, valves, and hose.
PRW-25	5/20/13	0	0	NP	11	0	0.2	10	good	good	poor	fair	good	fair	0	Cap and valves corroded.	Replace cap and hose, maybe valves. Consider attaching warning placard.
PRW-26	5/23/13	0	0.7	8.44	9.68	1.24	478	4.6	fair	good	poor	poor	good	poor	0.75	Cap, valves corroded, hose brittle.	Replace cap and hose, maybe valves. Consider attaching warning placard.
PRW-27	5/23/13	0	0	8.6	9.79	1.19	310	>99.9	fair	good	poor	poor	fair	poor	0.75	Vault, cap, and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-28	5/23/13	2.2	3.9	6.05	7.48	1.43	352	>99.9	fair	good	fair	poor	fair	poor	5.5	Vault, cap, and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-29	5/23/13	0	0	8.6	12.07	3.47	277	>99.9	fair	good	poor	fair	fair	poor	1.5	Vault, cap, and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-30	5/23/13	1.1	1.6	7.97	10.17	2.2	78.7	1.7	fair	good	poor	poor	fair	poor	2.5	Vault, cap, and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-31	5/23/13	0	0.1	NP	8.04	0	0.9	2.5	good	good	poor	fair	fair	poor	0.75	Vault, cap, and valves corroded, hose brittle.	Replace cap, valves, and hose.

TABLE 2
MULTI-PHASE EXTRACTION WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Geoflex Tubing	Bellowsflex Hose	Water in Vault (in)	Comments	Recommendations
PRW-32	5/23/13	0.2	0.4	7.27	9.06	1.79	131.5	>99.9	poor	fair	poor	poor	fair	poor	0	Vault, cap, and valves corroded, hose brittle.	Replace vault, cap, valves, and hose. Consider attaching warning placard.
PRW-33	5/23/13	9.2	13.8	8.76	9.49	0.73	245	>99.9	poor	fair	poor	poor	fair	poor	0	Vault, cap, and valves highly corroded, hose brittle.	Replace vault, cap, valves, and hose. Consider attaching warning placard.
PRW-34	5/23/13	0.8	2.6	6.86	9.25	2.39	122.6	>99.9	fair	good	poor	poor	fair	poor	0	Cap, valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-35	5/23/13	0	0	NP	7.24	0	0.5	2.1	fair	good	poor	poor	fair	poor	0.25	Cap, valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-36	5/23/13	0	0.1	6.87	10.84	3.97	91.6	>99.9	fair	fair	poor	poor	fair	poor	0	Vault, cap, valves corroded, hose brittle.	Replace cap, valves and hose. Consider attaching warning placard.
PRW-37	5/22/13	0	0	5.96	8.38	2.42	79.3	1.7	fair	good	fair	fair	good	poor	1	Cap corroded, hose brittle.	Replace cap and hose. Consider attaching warning placard.
PRW-38	5/22/13	1.2	0	6.09	9.99	3.9	68.3	24.9	fair	good	poor	poor	fair	fair	<1	Cap and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-39	5/22/13	10.3	0	6.2	7.84	1.64	70.7	>99.9	fair	good	poor	fair	good	fair	1	Cap corroded.	Replace cap and hose. Consider attaching warning placard.

TABLE 2
MULTI-PHASE EXTRACTION WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Geoflex Tubing	Bellowsflex Hose	Water in Vault (in)	Comments	Recommendations
PRW-40	5/22/13	4.8	8.5	5.45	10.02	4.57	185	>99.9	poor	fair	poor	poor	fair	poor	1	Vault, cap, valves highly corroded, hose brittle. Mislabeled on map as PRW-39.	Replace vault, cap, valves, and hose. Consider attaching warning placard.
PRW-41	5/22/13	0.2	0.1	4.9	10.39	5.49	51.2	3.2	fair	fair	poor	fair	fair	poor	4	Cap and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-42	5/22/13	0	0	5.7	6.46	0.76	142.7	>99.9	poor	fair	poor	fair	fair	poor	1.5	Vault, cap, and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-43	5/21/13	No air space	No air space	5.3	11.79	6.49	79	>99.9	fair	good	poor	poor	fair	poor	Full	Vault, cap, and valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-44	5/21/13	2.9	0	6.57	6.58	0.01	36.1	>99.9	fair	good	poor	poor	fair	poor	0	Vault, cap, valves corroded, hose brittle.	Replace cap, valves, and hose. Consider attaching warning placard.
PRW-45	5/22/13	0.2	0	3.02	3.03	0.01	30	2.5	good	good	fair	fair	good	fair	minor	Well cap slightly corroded.	Replace cap and hose. Consider attaching warning placard.

TABLE 2
MULTI-PHASE EXTRACTION WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Geoflex Tubing	Bellowsflex Hose	Water in Vault (in)	Comments	Recommendations
PRW-46	5/22/13	0.1	0	3.64	10.18	6.54	54.6	>99.9	good	poor	poor	poor	fair	poor	<1	Top of casing cracked. Well cap, valves corroded, hose brittle.	Repair top of casing and other PCV piping, replace cap, valves, and hose. Consider attaching warning placard.
PRW-97	5/23/13	0.6	0	NP	8	0	0.6	1.4	good	good	fair	good	good	fair	0	Well in good shape relative to the rest.	Replace cap, valves, and hose.
PRW-98	5/23/13	0	0	NP	7.6	0	0	0	good	good	good	good	good	fair	1.75	Well in good shape relative to the rest.	Replace vault, cap, valves, and hose.
PRW-99	5/23/13	0.4	0	NP	8.03	0	1.3	0	good	good	fair	good	good	fair	0	Well in good shape relative to the rest.	Replace cap, valves, and hose.
PRW-100	5/23/13	0.4	0	NP	7.03	0	0	0	good	good	fair	good	good	fair	0	Well in good shape relative to the rest.	Replace cap, valves, and hose.

Notes:
Depth to water and free product measurements in feet below the top of the casing.
ppm = parts per million

TABLE 3
PRODUCT RECOVERY WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Vault Integrity	Well Casing	Well Cap	Valves on Horizontal Lines	Comments	Recommendations
RW-1	6/17/13	0.0	0.0	NP	6.79	0	0.0	0.0	fair	good	good	fair	4-inch screw on cap, some plumbing, no hoses	Replace vault, valves, cap, and hoses.
RW-2	6/17/13	0.0	0.0	NP	6.56	0	0.3	0.0	fair	good	good	fair	4-inch screw on cap, some plumbing, no hoses	Replace vault, valves, cap, and hoses.
RW-3	6/17/13	0.6	0.7	5.66	8.15	2.49	>5000	>99.9	poor	good	good	fair	4-inch screw on cap, some plumbing, no hoses. 1.5 " of standing water	Replace vault, valves, cap, and hoses. Consider attaching warning placard.
RW-4	6/17/13	0.0	0.0	8.18	11.82	3.64	0.0	0.25	fair	good	good	fair	4-inch screw on cap, some plumbing, no hoses	Replace vault, valves, cap, and hoses.
RW-5	5/24/13	0.3	14.7	9.39	14.15	4.86	8.7	3.8	fair	good	good	fair	4-inch screw on cap, no hoses, covered in muck. Lid corroded. 4' of standing water	Replace vault, valves, cap, and hoses. Consider attaching warning placard.
RW5-01	6/19/13	NM	NM	10.98	10.99	0.01	1700	>99.9					Six-inch well, sticking about 4 inches up from an 8-inch vault in a flush-mount pad.	Consider attaching warning placard.
RW-6	5/24/13	0.0	0.0	12.26	14.33	2.07	241.9	>99.9	poor	good	good	gone	4-inch screw on cap, no hoses	Replace vault, valves, cap, and hoses. Consider attaching warning placard.
RW-7	5/24/13	0.3	0.0	11.27	12.88	1.61	312	12.0	poor	good	good	poor	4-inch screw on cap, no hoses	Replace vault, valves, cap, and hoses. Consider attaching warning placard.
RW-8	5/24/13	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Paved over.	Might be salvageable
RW-9	5/24/13	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Not found	Not found
RW-10	5/24/13	0.2	0.3	NP	12.00	0	0.0	0.0	poor	broken	gone	gone	6-inch casing, no cap, no hoses. Sediment accumulation	Replace vault, valves, cap, and hoses.
RW-11	5/24/13	0.0	0.0	10.72	12.57	1.85	234	>99.9	poor	good	good	gone	Corroded, large rusty peices inside vault	Replace vault, valves, cap, and hoses. Consider attaching warning placard.
RW-12	5/24/13	0.0	0.2	NP	11.25	0	0.0	0.0	fair	good	good	poor	6-inch cap, no hoses, metal parts poor	Replace vault, valves, cap, and hoses.

Notes:
Depth to water and free product measurements in feet below the top of the casing.
ppm = parts per million
NP = no product
NM = not measured

TABLE 4
MONITORING WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Comments	Recommendations
DMW4-14	06/17/13	0	0	NP	6.04	0	0	0	Flush-mount. Had to clean out vault. Well TD over 24 ft btoc. Soft bottom.	Clean out well to TD.
DMW5-21	06/18/13	NM	NM	NP	12.21	0	0.3	2	TD 17.35 ft btoc, flush-mount, pad fractured, outer casing filled with dirt	None
DMW5-29	06/18/13	3.0	3.0	NP	11.76	0	9.1	6	TD 40 ft btoc, flush-mount.	None
MW-101-1	06/18/13	NM	NM	NM	NM	NM	NM	NM	Well not found	None.
MW-101-10	06/18/13	0.0	0.0	NP	6.11	0	0	0	Flush-mount well. Replaced cap.	None
MW-101-3	06/18/13	0.3	0.0	NP	9.98	0	0	0	Flush-mount well. Replaced cap.	None.
MW101-4	06/18/13	0.0	0.0	NP	10.38	0	0	0	Flush-mount well. Replaced cap.	None.
MW-101-5D	06/18/13	0.0	0.0	NP	10.43	0	0	0	Flush-mount well. Replaced cap.	None.
MW101-6	06/18/13	0.0	0.0	2.5	NM	>1.0	0	0	Flush-mount well. Product in well was very thick and black. Does not compare with product in wells to the southwest. Did not drop probe through this substance to find water.	None.
MW-101-7	06/18/13	0.0	0.0	NP	7.92	0	0	0	Flush-mount well.	None.
MW-101-8	06/18/13	0.0	0.0	9.6	9.8	0.2	0	0	Flush-mount well. Product in well is dark. Does not compare with product in wells to the southwest. Did not drop probe through this substance to find water.	None.
MW-101-9	06/18/13	NM	NM	NM	NM	NM	NM	NM	Well not found	None
MW4-02	06/17/13	0	0	NP	9.42	0	0	0	Stick-up well.	None
MW4-03	06/17/13	0	0	NP	2.15	0	0	0	Stick-up well filled in to 2.15 ft btoc. Replaced cap.	Clean out well to TD. Re-attach locking lid to steel protective casing.
MW4-04	06/17/13	0	0	NP	6.55	0	0	0	Stick-up well. Replaced cap.	Re-attach locking lid to steel protective casing.
MW4-05	06/17/13	0	0	6.89	7.25	0.36	49.1	0	Well labeled MW4-11, although named MW4-05 on map. Replaced cap.	Re-attach locking lid to steel protective casing.
MW4-06	06/17/13	NM	NM	NM	NM	NM	NM	NM	Stick-up well. 6-inch steel protective casing. Silted up to 2.7 ft btoc. Replaced cap.	Clean out well to TD. Re-attach locking lid to top of casing
MW4-07	06/17/13	0	0	NP	> 8.80	0	0	0	Stick-up well. Silted up to 8.80'. Metal protective casing. Replaced cap.	Clean out well to TD.

TABLE 4
MONITORING WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Comments	Recommendations
MW4-08	06/18/13	0.0	0.0	NP	7.47	0	0	0	Stick-up well in 6" yellow metal protective casing. Lid is uatttached.	Needs concrete pad for protective casing. Re-attach locking lid to protective casing.
MW4-10	06/17/13	0	0	NP	6.18	0	0	0	Flush-mount well. Replaced cap.	None.
MW4-11	06/17/13	0.0	0.0	NP	6.24	0	0	0	Flush-mount well. Cover missing.	Obtain replacement well cover.
MW4-12	06/17/13	0	0	4.80	10.59	5.79	131.4	>99.9	Flush-mount well. Had to clean out vault to open well.	Obtain replacement well cover.
MW4-15	06/17/13	0.0	0.0	NP	6.54	0	0	0	Flush mount well with broken manhole cover.	Obtain replacement well cover.
MW4-16	06/17/13	0.0	0.0	NP	5.86	0	0	0	Flush mount well with broken manhole cover.	Obtain replacement well cover.
MW4-18	06/19/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW4-19	06/19/13	0.0	0.0	NP	6.79	0	0	0	Flush-mount well , cover cracked, cap not on, full of dirt.	Clean out well. Obtain new cover.
MW4-20	06/19/13	0.0	0.0	0	9.8	0	3	14.8	Flush-mount well.	None.
MW4-21	06/17/13	0	0.2	NP	5.34	0	0	0.3	Flush-mount well. Cover missing.	Obtain replacement well cover.
MW4-22	06/18/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW4-23	06/18/13	9.4	0.8	9.62	17.57	7.95	118	>99.9	Flush-mount well. Vault corroded & flaking. Crystal coating on well cap.	Replace well vault and cover.
MW4-24	06/18/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW4-25	06/18/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW4-26	06/17/13	NM	NM	NM	NM	NM	NM	NM	Flush mount with pavement. Cannot get steel well cover off.	Obtain replacement cover, then bust up the old one and remove.
MW4-27	06/17/13	8.1	0	NP	8.60	0	129.8	>99.9	Flush-mount 1-inch well.	None.
MW5-02	06/18/13	1.2	1.8	10.27	10.28	0.01	288	>99.9	Flush-mount well. Cover broken.	Obtain replacement cover.
MW5-04	06/18/13	85+	3.0	NP	10.39	0	283	>99.9	Flush-mount well.	None.
MW5-06	06/19/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None
MW5-07	06/19/13	NM	NM	NP	11.91	0	80	70	Stick-up well right up against tank. No protective casing.	Pour concrete pad and set protective casing around well.
MW5-08	06/19/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW5-09 (#1)	06/19/13	0.0	0.0	0	10.13	0	0	0	Stick-up well. TD = 17.35 ft btoc. No protective casing. Rain gauge attached. One of 2 wells named MW5-09.	Build pad and install protective casing around well.

TABLE 4
MONITORING WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Comments	Recommendations
MW5-09 (#2)	06/18/13	NM	NM	NM	NM	NM	NM	NM	Note that there are 2 wells labeled MW5-09 on the site map. This is the one near the terminal building that has been paved over.	Cut pavement to expose well and abandon properly to stop outgassing of H2S.
MW5-10	06/18/13	NM	NM	NM	NM	NM	NM	NM	Well not found	None.
MW5-11	06/18/13	0.0	0.0	8.67	9.62	0.95	124.9	>99.9	Stick-up well, no protective casing.	Build pad and install protective casing around well.
MW5-13	06/19/13	NM	NM	11.01	13.08	2.07	>5000	>99.9	Stick-up well, no protective casing.	Build pad and install protective casing around well.
MW5-14	06/18/13	0.0	0.0	10.87	11.78	0.91	179	>99.9	Flush-mount well, crystal coating on cap.	None.
MW5-19	06/18/13	195.0	>100	10.34	12.05	1.71	125	>99.9	Flush-mount well, replaced cap.	None.
MW5-20	06/19/13	161.0	>100	8.92	9.98	1.06	161	>99.9	Flush mount well, replaced cap.	None.
MW5-23	06/18/13	NM	NM	NM	NM	NM	NM	NM	Well not found. Probably under pile of scrap metal.	Inspect when well becomes accessible.
MW5-24	06/18/13	1.8	14.2	11.25	14.6	3.35	264	>99.9	Flush-mount well. Fe-staining around outside edge of well. Highly corroded vault and cover.	Replace vault and cover.
MW5-25	06/18/13	NM	NM	NM	NM	NM	NM	NM	Abandoned. Paved over. Staining on asphalt.	Cut pavement, dig up well head, seal well, patch pavement.
MW5-26	06/18/13	NM	NM	NM	NM	NM	NM	NM	Could not remove well cover.	Obtain replacement cover, then bust up the old one and remove.
MW5-26A	06/18/13	0.0	0.0	NM	NM	NM	75	0	RW5-03? Or a monitoring well? Cannot tell. 6-inch PVC casing filled w/ dirt, augered out petroleum laden soil at 1' BGL. Did not auger to water table.	Clean out well and use as a monitoring well.
MW5-27	06/18/13	NM	NM	NM	NM	NM	NM	NM	Abandoned. Paved over. Staining on asphalt.	Cut pavement, dig up well head, seal well, patch pavement.
MW5-28	06/18/13	NM	NM	NM	NM	NM	NM	NM	Could not remove cover. Seems to be cemented in place. Well likely abandoned.	None.
MW5-30	06/19/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW5-31	06/18/13	NM	NM	NM	NM	NM	NM	NM	Could not find well.	None.
MW5-32	06/18/13	0.0	0.0	7.12	7.42	0.3	26.4	0	Stick-up well in protective metal casing.	None.
MW5-33	06/18/13	0.0	0.0	NP	8.31	0	0	0	Stick-up well in protective metal casing.	None.

TABLE 4
MONITORING WELL SURVEY
TRANSMONTAIGNE PORT MANATEE TERMINAL
804 NORTH DOCK STREET, PALMETTO, FLORIDA
TRANSMONTAIGNE TERMINALS LLC

Well Number	Date	Vault VOCs (ppm)	Vault H2S (ppm)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Casing VOCs (ppm)	Casing H2S (ppm)	Comments	Recommendations
MW5-34	06/18/13	0.0	0.0	NP	7.4	0	0	0	Stick-up well in protective metal casing.	None.
MW5-35	06/17/13	0.0	0.0	NP	7.02	0	0	0	Stick-up well in protective metal casing.	None.
MW5-36	06/17/13	0.0	0.0	NP	3.42	0	0	0	Flush-mount, cover intact, replace cap.	None.
MW5-37	06/19/13	12.5	0.0	NP	4.95	0	>57	>99.9	Flush-mount, cover intact, replace cap.	None.
MW5-38	06/19/13	0.0	0.0	NP	5.06	0	0	0	Flush-mount, cover intact, replace cap.	None.
MW5-39	06/19/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW5-40	06/09/13	NM	NM	NM	NM	NM	NM	NM	Well not found.	None.
MW5-41	06/17/13	0.0	0.0	4.11	7.8	3.69	3.3	0	Flush-mount 1-inch well, good cap.	None.
MW5-42	06/18/13	0.0	0.0	NP	5.71	0	1.4	0	Flush-mount 1-inch well, good cap.	None.
MW5-43	06/18/13	0.0	0.0	NP	ground level	0	0	0	1-inch well, flush-mount, mostly hidden under concrete pylon.	None.
PW-1	06/18/13	0.0	0.0	NP	7.91	0	0	0	2-foot diameter pipe.	None.
PW-2	06/18/13	0.0	0.0	NP	5.5	0	0	0	2-foot diameter pipe.	None.
PW-3	06/18/13	0.0	0.0	NP	6.29	0	0	0	2-foot diameter pipe.	None.
TWJ-6	06/17/13	0.0	0.0	NP	6.48	0	1.2	10.6	Stick-up well inside metal protective casing.	None.
TWP5-1	06/17/13	0.0	0.0	5.79	6.84	1.06	88.6	>99.9	Stick-up well inside metal protective casing.	None.
TWP5-2	06/17/13	0.0	0.0	4.66	4.67	0.01	>5000	0	Stick-up well inside metal protective casing.	None.
TWP5-3	06/17/13	0.0	0.0	NM	NM	NM	8.1	0	Stick-up well inside metal protective casing. Well bent at ground level enough to prevent interface probe entry.	Attempt to repair well.
TWP5-4	06/17/13	0.0	0.0	NP	4.72	0	8	2.4	Stick-up well inside metal protective casing.	None.
TWP5-5	06/17/13	NM	NM	NM	NM	NM	NM	NM	Could not find well.	None.

Notes:
Depth to water and free product measurements in feet below the top of the casing.
ppm = parts per million
NP = no product
NM = not measured

APPENDIX A
ANALYTICAL LABORATORY REPORT

ANALYTICAL REPORT

Report Date: May 31, 2013

Keith Pollman
LT Environmental, Inc.
6620 NW 38th Terrace
Gainesville, FL 32653

Phone: (352) 371-1770

E-mail: kpollman@ltenv.com

Workorder: **34-1314327**
Client Project ID: Port Manatec-TransMontaigne Te
Purchase Order: Port Manatec-TransMo
Project Manager: Paul Pope

Analytical Results

Sample ID: **4914** Media: SKC 226-09, Charcoal Tube 400/200mg Collected: 05/22/2013
Received: 05/23/2013
Lab ID: 1314327001 Sampling Location: Port Manatec-TransMo

Method: NIOSH 6013 **Sampling Parameter: Air Volume 36 L** **Analyzed:** 05/31/2013

Analyte	ug/sample	mg/m³	ppm	RL (ug/sample)
Hydrogen sulfide	**0.51**	**0.014**	**0.010**	0.18

Sample ID: **4917** Media: SKC 226-09, Charcoal Tube 400/200mg Collected: 05/22/2013
Received: 05/23/2013
Lab ID: 1314327002 Sampling Location: Port Manatec-TransMo

Method: NIOSH 6013 **Sampling Parameter: Air Volume 36 L** **Analyzed:** 05/31/2013

Analyte	ug/sample	mg/m³	ppm	RL (ug/sample)
Hydrogen sulfide	<0.18	<0.0049	<0.0035	0.18

Sample ID: **4919** Media: SKC 226-09, Charcoal Tube 400/200mg Collected: 05/22/2013
Received: 05/23/2013
Lab ID: 1314327003 Sampling Location: Port Manatec-TransMo

Method: NIOSH 6013 **Sampling Parameter: Air Volume 36 L** **Analyzed:** 05/31/2013

Analyte	ug/sample	mg/m³	ppm	RL (ug/sample)
Hydrogen sulfide	<0.18	<0.0049	<0.0035	0.18

ANALYTICAL REPORT

Workorder: **34-1314327**
Client Project ID: Port Manatec-TransMontaigne Te
Purchase Order: Port Manatec-TransMo
Project Manager: Paul Pope

Analytical Results

Sample ID: **4916** Media: SKC 226-09, Charcoal Tube 400/200mg
Collected: 05/22/2013
Received: 05/23/2013
Lab ID: 1314327004 Sampling Location: Port Manatec-TransMo

Method: **NIOSH 6013** **Sampling Parameter:** **Air Volume 36 L** **Analyzed:** 05/31/2013

Analyte	ug/sample	mg/m³	ppm	RL (ug/sample)
Hydrogen sulfide	**0.23**	**0.0065**	**0.0047**	0.18

Sample ID: **4922-Blank** Media: SKC 226-09, Charcoal Tube 400/200mg
Collected: 05/22/2013
Received: 05/23/2013
Lab ID: 1314327005 Sampling Location: Port Manatec-TransMo

Method: **NIOSH 6013** **Sampling Parameter:** **Air Volume Not Applicable** **Analyzed:** 05/31/2013

Analyte	ug/sample	mg/m³	ppm	RL (ug/sample)
Hydrogen sulfide	**0.81**	NA	NA	0.18

Comments

Quality Control: **NIOSH 6013 - (HBN: 107605)**

The LCS, LCSD and all field sample results have been media blank corrected with the LMB.

Report Authorization

Method	Analyst	Peer Review
NIOSH 6013	Neil Brasfield	Thomas T. McKay

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: **34-1314327**
Client Project ID: Port Manatec-TransMontaigne Te
Purchase Order: Port Manatec-TransMo
Project Manager: Paul Pope

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACLASS (DoD ELAP)	ADE-1420	http://www.aclasscorp.com
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Florida (TNI)	E871067	http://www.dep.state.fl.us/labs/bars/sas/qa/
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing:			
CPSC	ACLASS (ISO 17025, CPSC)	ADE-1420	http://www.aclasscorp.com
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	http://www.aihaaccreditedlabs.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

APPENDIX B
WELL PHOTOGRAPHS ON CD

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Tampa, FL 33634
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intertek.com/building
psiusa.com

November 13, 2017

Manatee County Government
Public Works Department
1022 26th Avenue East
Bradenton, Florida 34208

Attn: Michael L. Sturm, P.E.
Project Manager – Manatee County Public Works
Michael.sturm@mymanatee.org
941-708-7450, ext. 7332

Re: Letter Report
Environmental Assessment to Support Utility Construction
Orlando Avenue Utility Project
Contract #16-0759CP
Professional Environmental Services
Bradenton, Manatee County, Florida

Dear Mr. Sturm:

As per the terms of our contract, Professional Service Industries, Inc. (PSI) has prepared this Letter Report detailing the environmental assessment work supporting the utility work for the Orlando Avenue Utility Project referenced above. This report is being transmitted via email only.

Due to a concern of potential petroleum related contamination along the planned utility corridor PSI conducted a review of site files and identified areas of concern near the intersection of 14TH Street (Hwy 41) and Orlando Avenue in South Bradenton, Florida. PSI performed an assessment of the soil and groundwater in the area on October 24, 2017.

SOIL ASSESSMENT ACTIVITES

PSI supervised the advancement of three (3) soil sample borings to a depth of approximately 15 feet below land surface (ft bls) in the right-of-way near the intersection of 14TH Street (Hwy 41) and Orlando Avenue in South Bradenton, Florida. The soil sample locations were labeled as SB-1, SB-2, and SB-3. Samples were collected from each boring location in 1-foot intervals, visually inspected, logged, and screened with an Organic Vapor Analyzer/Photoionization Detector for potential contamination. OVA readings were less than 1 parts per million in each interval for soil boring locations SB-1 and SB-3. Elevated OVA readings were detected at SB-2 from approximately 2 – 9 ft bls.

Samples for laboratory analysis were collected from each soil boring in the 2-3 ft bls interval and an additional sample was collected from SB-2 in the 6-7 ft bls interval. Based on OVA readings only the sample for SB-2 in the 6-7 foot interval was analyzed. Soil samples were analyzed by the following EPA Methods: 8260B for VOCs, 8270D for SVOCs, 6010C for Lead and FDEP method FL-PRO for TPH. Laboratory results show no exceedances of FDEP soil cleanup target levels (SCTLs) for any of the parameters tested.

GROUNDWATER ASSESSMENT ACTIVITES

PSI collected screen point (SP) groundwater samples (SB-1, SB-2, and SB-3) from each boring location. The depth to groundwater at each location was approximately 5 ft bls and the samples were collected in the 5-9 ft bls interval. Each groundwater sample was analyzed by the following EPA Methods: 8260B for VOCs, 8270D for SVOCs, 6010C for Lead and FL-PRO for TPH. Laboratory results for both locations show no exceedances of FDEP groundwater cleanup target levels (GCTLs) for any of the parameters tested.

The approximate location of the samples is provided on the figure in **Attachment A** and field notes and logs are provided in **Attachment B**. The Laboratory Report is provided in **Attachment C** and photographs of the field work is provided in **Attachment D**. The soil and groundwater samples were analyzed by ENCO Laboratories (National Environmental Laboratory Accreditation Program ID# E83182). Quality Control and Assurance analysis was included with the sample analysis and no issues were reported. Samples were collected according to Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (DEP-SOP001/01) for soils (FS 3000) and groundwater (FS 2200). Prior to site work PSI notified Sunshine Locate to identify underground utilities (Ticket #286702829).

CONCLUSIONS & RECOMMENDATIONS

PSI completed an environmental assessment of soils and groundwater near the intersection of 14TH Street (Hwy 41) and Orlando Avenue in South Bradenton, Florida along the planned Orlando Avenue utility corridor. Testing results indicate no petroleum contamination exceeding FDEP regulatory criteria in soils or groundwater. However, dewatering or trenching operations may affect the nearby contaminated groundwater and soils at the current Chick-Fil-A property. PSI recommends discussion of planned construction activities for preparation of any necessary permits or notifications, and employing proper management of any contaminated soils or groundwater.

Should you have any questions feel free to contact either the project manager or contract manager.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.

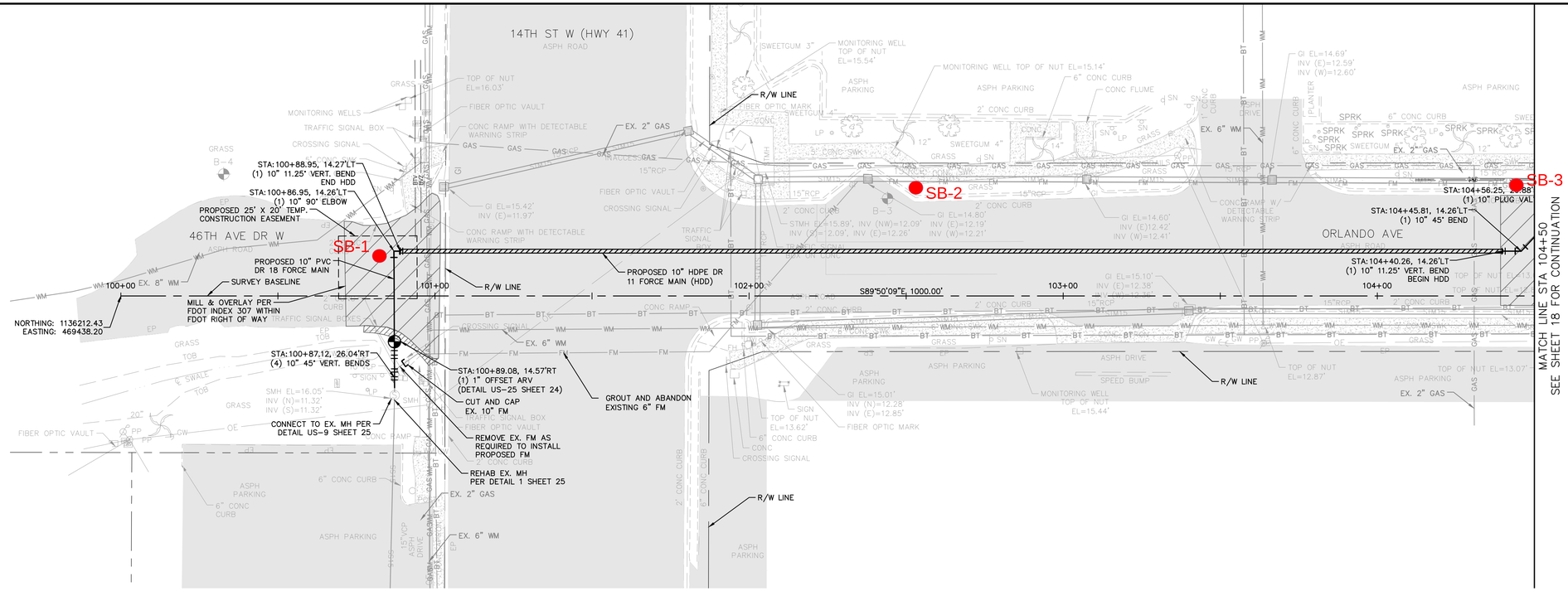
Benedict Marshall P.E.
Project Manager

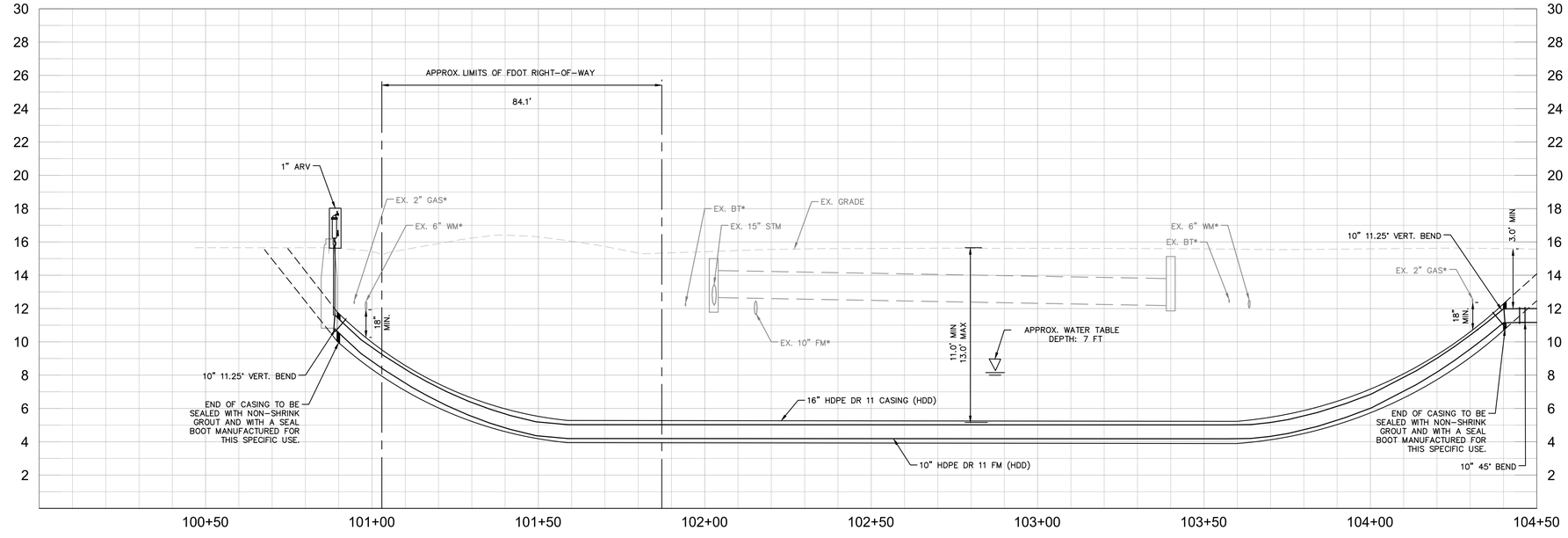
Michael Rothenburg, P.E.
Contract Manager

Attachments:
- A – Sample Location Figure
- B – Field Notes and Logs
- C – Laboratory Report
- D – Photograph Log of Field Work

\\Tampa-fs1\projects\552-Env\05522422 Manatee Co Orlando Ave FM\Report

ATTACHMENT A
SAMPLE LOCATION FIGURE





NORTH

GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

LEGEND
- REMOVE & REPLACE SIDEWALK
- ROADWAY RESTORATION
- REMOVE & REPLACE CURB

NOTES:

1. CONTRACTOR TO FOLLOW RESTRAINED LENGTHS SET IN RESTRAIN LENGTH DETAILS ON SHEET 24 & 25.
2. CONSTRUCTION DEWATERING SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO CHAPTERS 62-621.300 AND 62-620 OF THE FLORIDA ADMINISTRATIVE CODE (FAC).
3. REFER TO DETAIL UG-12 SHEET 23 FOR COUNTY ROADWAY REPAIR REQUIREMENTS

*NOTES:
THE ELEVATIONS OF THE UTILITIES MARKED WITH AN ASTERISK (*) HAVE BEEN ASSUMED ON THE BASIS OF TYPICAL ANTICIPATED SOIL COVERAGE. CONTRACTOR SHALL NOT RELY ON THIS INFORMATION FOR CONSTRUCTION, BUT SHALL BE RESPONSIBLE FOR FIELD LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL UTILITIES CROSSING THE PROPOSED FORCE MAIN. CONTRACTOR SHALL INCLUDE IN THE UNIT COST OF THE SUBJECT FORCE MAIN CONSTRUCTION, THE COST OF UTILITY ADJUSTMENTS NECESSARY TO ATTAIN DESIGN MINIMUM SEPARATION FOR UTILITIES CONFLICTING WITH THE CONSTRUCTION OF THE PROPOSED FORCE MAIN. INTERRUPTIONS OF ANY EXISTING UTILITY SERVICES SHALL BE NOTICED TO EFFECTED CUSTOMERS A MINIMUM OF 48 HOURS IN ADVANCE AND SHALL NOT EXCEED 4 HOURS IN DURATION.

WHERE CONCRETE REPAIRS ARE NECESSARY AND EXPANSION JOINTS ARE PRESENT, CONTRACTOR TO REMOVE AND REPLACE CONCRETE UP TO THE NEXT EXPANSION JOINT; OTHERWISE, REPLACE CONCRETE AS NECESSARY.

GROUNDWATER / DEWATERING NOTE:
THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS.

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2017 KIMLEY-HORN AND ASSOCIATES, INC.
655 NORTH FRANKLIN STREET, SUITE 150, TAMPA, FL 33602
PHONE: 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400016
DATE 6/22/2017
SCALE AS SHOWN
DESIGNED BY WWW
DRAWN BY JRT
CHECKED BY WEW

Manatee County FLORIDA

END OF SERVICE LIFE
PACKAGE B: FM 15/ FM 1/ ORLANDO AVE.
MANATEE COUNTY FL

LICENSED PROFESSIONAL
W. WADE WOOD, P.E
FL LICENSE NUMBER
69051
DATE:

PLAN AND PROFILE ORLANDO AVENUE

SHEET NUMBER
17

ATTACHMENT B
FIELD NOTES AND LOGS

Location Bradenton, FL Date 10-24-17

Project / Client Manatee County - Orlando Avenue FM 05522422

0750 - Anthony Hall is leaving the office after loading up PSI truck F-150. ~~F-in hand~~

0900 NET Drilling and PSI are on site we are going to go over the scope of work. Anthony is going to set up signs and start checking the calibration of equipment.

0945 we are starting SB-3

1005 Finished SB-3

1320 Anthony Hall is checking his equipment we have finished all SB and water points NET is cleaning up.

1425 NET is Leaving site and I heading to meet Joann with enCo to give her samples

1525 Anthony is arriving at the office for the day

Anthony Hall

1-5

Location Bradenton, FL Date 10-24-17

Project / Client Manatee county - orlando ave 05522422 Scale

SB-3 Dark brown silty fine sand

0-1'

1-2' dark brown, brown silty fine sand

2-3 Tan silty fine sand

3-4' Tan, brown silty fine sand

4-5 Tan silty fine sands, shell

6-12 Dark brown fine sands

13-15 Dark brown fine sands shell

ID	SB-3 OVA	OVA	OVA
	1'00	7 0.1	13 0.1
	2 0.0	8 0.1	14 0.1
	3 0.0	9 0.1	15 0.1
	4 0.0	10 0.1	
	5 0.0	11 0.1	
	6 0.0	12 0.1	

2-5 Rite in the Rain

Location Bradenton, FL Date 10-24-17

Project / Client Manatee county - orlando Ave

0552242

SB 2 dark Brown fine sand
0-2'↑
2-4 sandy clay gray, fine
4-6 dark brown silty fine sand
6-9 gray silty fine sand, shell
9-15 dark brown silty fine sand

3M
4W
5S

Sample ID

SB-2

		OVA	
1	0	9	6.0
2	103.2	10	0.0
3	195.5	12	0.0
4	86.0	13	0.0
5	76.8	14	0.0
6	940.9	15	0.0
7	478.9		
8	11.9		

Location Bradenton, FL Date 10-24-17

Project / Client Manatee county - orlando Ave

Scale

SB- 0-2 Dark brown fine sand
2-3 Tan clayey sand fine
3-4 gray sandy clay fine
4-5 dark brown silty fine sand
3M 5-8 dark brown fine sand
4W shell
5S 8-15 gray fine sand, shell

Sample ID

SB1

OVA

1	0.0	8	0.0
2	0.0	9	0.1
3	0.0	10	0.1
4	0.0	11	0.1
5	0.0	12	0.1
6	0.0	13	0.1
7	0.0	14	0.1
		15	0.1

94

Location Bradenton, FL Date 10-24-17

Project / Client Manatee county - orlando ave

05522422

Sample ID CSS	Time
SB-3 (2-3)	1030
SB-2 (2-3)	1055
SB-1 (2-3)	1130
SB-2 (6-7)	1105

Sample ID

~~San~~ SB-3	1108
SB-2	1207
SB-1	1308

5-5

BORING LOG

Boring/Well Number:	Permit Number:	FDEP Facility Identification Number:
SB-1		
Site Name:	**Borehole Start Date:** 10-24-17 **Borehole Start Time:** 1135 ☒ AM ☐ PM	
Manatee County - Orlando AUC	**End Date:** 10-24-17 **End Time:** 1155 ☒ AM ☐ PM	
Environmental Contractor:	**Geologist's Name:**	**Environmental Technician's Name:**
PSE		Anthony Hall

Drilling Company:	Pavement Thickness (inches):	Borehole Diameter (inches):	Borehole Depth (feet):
NET	0	4	15

Drilling Method(s):	Apparent Borehole DTW (in feet from soil moisture content):	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type):
HA / DP	5.5	-	☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☒ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA	5	60				0.0	1	0-2' Dark brown fine sand	SP	D	
						0.0	2	2-3' Tan fine clayey sand	GC		2-3' sample
						0.0	3	3-4' gray fine sandy clay		M	
						0.0	4	4-5' Dark brown silty fine sand	SM	W	
DP	5	60				0.0	5	5-8' Dark brown fine sand shell	SP	S	
						0.0	6				
						0.0	7				
						0.0	8	8-15 gray fine sand, shell			
						0.1	9				
						0.1	10				
DP	5	60				0.1	11				
						0.1	12				

Sample Type Codes: PH = Post Hole, HA = Hand Auger, SS = Split Spoon, ST = Shelby Tube, DP = Direct Push, SC = Sonic Core, DC = Drill Cuttings

Moisture Content Codes: D = Dry, M = Moist, W = Wet, S = Saturated

BORING LOG

Boring/Well Number:	FDEP Facility Identification Number:	Site Name:	Borehole Start Date:
SB-1		manatee county orlando ave	10-24-17 End Date: 10-24-17

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
DP	5	60				0.1	13	8-15' Gray fine sand, shell	SP	S	
						0.1	14				
						0.1	15				
							16				
							17				
							18				
							19				
							20				
							21				
							22				
							23				
							24				
							25				
							26				
							27				
							28				
							29				
							30				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

BORING LOG

Boring/Well Number:	Permit Number:	FDEP Facility Identification Number:
SB-2		
Site Name:	**Borehole Start Date:** 10-24-17	**Borehole Start Time:** 1045 ☒ AM ☐ PM
Manatee county - orlando ave	**End Date:** 10-24-17	**End Time:** 1105 ☒ AM ☐ PM
Environmental Contractor:	**Geologist's Name:**	**Environmental Technician's Name:**
PSI		Anthony Hall

Drilling Company:	Pavement Thickness (inches):	Borehole Diameter (inches):	Borehole Depth (feet):
NET	0	4	15

Drilling Method(s):	Apparent Borehole DTW (in feet from soil moisture content)	Measured Well DTW (in feet after water recharges in well)	OVA (list model and check type):
HA / DP	5.5	-	☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☒ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA	5'	60				0.0	1	0-2 Dark brown fine sand	SP	D	
						103.2	2	2-4' Sandy ~~gray~~ Clay gray, fine Sand	GC		2-3' sample
						195.5	3			M	
						86.0	4	4-6' Dark brown silty fine sand	SM	W	
						76.8	5				
DP	5'	60				940.9	6	6-9' gray silty fine sand, shell		S	6-7' sample
						478.9	7				
						11.9	8				
						6.0	9	9-15' dark brown silty fine Sand			
		60				0.0	10				
						0.0	11				
						0.0	12				

Sample Type Codes: PH = Post Hole. HA = Hand Auger. SS = Split Spoon. ST = Shelby Tube. DP = Direct Push. SC = Sonic Core. DC = Drill Cuttings

Moisture Content Codes: D = Dry. M = Moist. W = Wet. S = Saturated

BORING LOG

Boring/Well Number:	FDEP Facility Identification Number:	Site Name:	Borehole Start Date:
SB-2		Manatee county Orlando ave	10-24-17 End Date: 10-24-17

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
DP	5'	60				0.0	13	9-15' Dark brown silty fine sand	SM	S	
						0.0	14				
						0.0	15				
							16				
							17				
							18				
							19				
							20				
							21				
							22				
							23				
							24				
							25				
							26				
							27				
							28				
							29				
							30				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings

Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

BORING LOG

Boring/Well Number:	Permit Number:	FDEP Facility Identification Number:
SB-3		
Site Name:	**Borehole Start Date:** 10-24-17 **End Date:** 10-24-17	**Borehole Start Time:** ~~1005~~ 0945 ☒ AM ☐ PM **End Time:** ~~1010~~ 1005 ☒ AM ☐ PM
Manatee county - orlando ave		
Environmental Contractor:	**Geologist's Name:**	**Environmental Technician's Name:**
PST		Anthony Hall

Drilling Company:	Pavement Thickness (inches):	Borehole Diameter (inches):	Borehole Depth (feet):
NET	0	4	15

Drilling Method(s):	Apparent Borehole DTW (in feet from soil moisture content):	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type):
HA / DP	5.5	-	☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☒ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA	5'	60						0-1' Dark brown silty fine sand	SM	D	
						0.0	1	1-2' Dark brown, brown silty fine sand			
						0.0	2	2-3' Tan silty fine sand			2-3' sample
						0.0	3	3-4' Tan, brown silty fine sand		3	
						0.0	4	4-8' Tan silty fine sand, shell		W	
						0.0	5			5	
DP	5'	60				0.0	6				
						0.1	7				
						0.1	8	8-12' Dark brown fine sand	SP		
						0.1	9				
						0.1	10				
	5	60				0.1	11				
						0.1	12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings

Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

BORING LOG

Boring/Well Number:	FDEP Facility Identification Number:	Site Name:	Borehole Start Date:
SB-3		Manatee county orlando ave	10-24-17 End Date: 10-24-17

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
DP	5'	60				0.1	13	13-15' Dark brown fine sand, shell	SP	S	
						0.1	14				
						0.1	15				
							16				
							17				
							18				
							19				
							20				
							21				
							22				
							23				
							24				
							25				
							26				
							27				
							28				
							29				
							30				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) Tiger PID Detector **INSTRUMENT #** T-105381

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☑ OTHER PID

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 0 ambient air
Standard B 100 PPM Isobutylene (C4H8)
Standard C Lot # HBH-248-100-11
Standard D Exp 09-20-2021 Manufactured by Gasco

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/10/24	0915	A	0	0	0	NO	Init	AH
↓	0916	B	100	97.9	2.1	NO	Init	AH
	1320	A	0	0	0	NO	cont	AH
↓	1321	B	100	95.5	4.5	NO	cont	AH

Boldly "X" this box if there is qualified data on this page.

Form FD9000-8 CALIBRATION LOG (FDEP SOP FT 1000-FT 1500, FD 1000-FD 4000) 11-10-05

Project/Site: Manatee county - Orlando Ave. Date: 10-24-17 Meter # 06K1082 AL

Temperature (Quarterly) *For Date of Last Temperature Verification see* ____ *in log book*

Dissolved Oxygen	DEP SOP FT 1500	Initials	Date	Time	Probe Charge	Probe Gain	mg/L	Temp °C	% DO	Saturation mg/L (from chart)	Pass or Fail
											Acceptance Criteria: +/-0.3mg/l
CAL ICV (CCV)		AH	10-24-17	1005	-	-	7.37	25.45	89.3	8.20	P (F)
(CAL) ICV CCV				1006	-	-	8.31	25.49	101.4	8.20	(P) F
CAL (ICV) CCV				1006	-	-	8.31	25.49	101.4	8.20	(P) F
CAL ICV (CCV)				1330	-	-	9.03	28.00	115.5	7.82	P (F)
(CAL) ICV CCV				1331			7.93	28.05	101.5	7.82	(P) F
CAL ICV CCV											P F
CAL ICV CCV											P F

Specific Conductance	DEP SOP FT 1200	Initials	Date	Time	Standard µmhos/cm	Exp. Date	Lot #	Bottle #	Cell Constant	Reading µmhos/cm	Pass or Fail
										Acceptance Criteria: +/- 5%	
CAL ICV (CCV)		AH	10-24-17	1008	1000	04-18	170414D	1	-	976	(P) F
CAL ICV (CCV)				1012	500	04-18	170327C	1	-	520	(P) F
CAL ICV (CCV)				1334	1000	04-18	170414D	1	-	978	(P) F
CAL ICV (CCV)				1337	505	04-18	170327C	1	-	524	(P) F
CAL ICV CCV											P F
CAL ICV CCV											P F
CAL ICV CCV											P F

pH	DEP SOP FT 1100	Initials	Date	Time	Standard SU	Exp. Date	Lot #	Bottle #	Slope	Reading SU	Pass or Fail
										Acceptance Criteria: +/- 0.2 SU	
CAL ICV (CCV)		AH	10-24-17	1013 15	7	08-18	170213G	1	-	6.89	(P) F
CAL ICV (CCV)				1013 18	4	04-18	170414A	1	-	4.01	(P) F
CAL ICV (CCV)				1007 21	10	08-18	170213C	1	-	9.94	(P) F
CAL ICV (CCV)				1342	7	08-18	170213G	1	-	6.88	(P) F
CAL ICV (CCV)				1345	4	04-18	170414A	1	-	4.04	(P) F
CAL ICV (CCV)				1348	10	08-18	170213C	1	-	9.94	(P) F
CAL ICV CCV											P F
CAL ICV CCV											P F
CAL ICV CCV											P F

Maintenance: Weekly pH Slope: ____ Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen Membrane Changed: Yes No

Notes:

Perform only in Calibrate Mode: **CAL** - Calibrate -
Perform only in Run Mode: **ICV** - Initial Calibration Verification
Perform only in Run Mode: **CCV** - Continuing Calibration Verification

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) 2100P Turbidimeter **INSTRUMENT #** 05030C011697
Hach

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.31 NTU Lot A6351 Secondary standards
Standard B 58.0 NTU Lot A6256
Standard C 589 NTU Lot A7004
Standard D _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/10/24	0947	A	4.31	4.56	5.5	NO	cont	AH
	0948	B	58.0	59.6	2.7	NO	cont	AH
	0949	C	589	592	.5	NO	cont	AH
	1325	A	4.31	4.31	0	NO	cont	AH
	1326	B	58.0	59.3	2.2	NO	cont	AH
	1327	C	589	593	0.6	NO	cont	AH

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Manatee county - orlando Avenue	SITE LOCATION: Bradenton, FL	
WELL NO: SB-1	SAMPLE ID:	DATE: 10.24.17

PURGING DATA

WELL DIAMETER (inches): 1"	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to 5 feet 9	STATIC DEPTH TO WATER (feet): -	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): ~~7~~ ~~6.5~~	FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~6.5~~	PURGING INITIATED AT: 1230	PURGING ENDED AT: 1306	TOTAL VOLUME PURGED (gallons): 2.52

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1300	7.10	2.10	0.07	-	7.13	31.04	636	0.33/4.4	14.5	clear	-95.7
1303	0.21	2.31		-	7.12	31.07	636	0.35/4.6	3.26	↓	-95.8
1306	0.21	2.52		-	7.12	31.13	636	0.33/4.4	3.05	↓	-95.4

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Anthony Hall PST	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1308	SAMPLING ENDED AT: 1315
PUMP OR TUBING DEPTH IN WELL (feet): ~~7~~ ~~6.5~~	TUBING MATERIAL CODE: HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	2	AG	250ml	H2SO4	-	-	Flo Ro	APP	250
	1	AG	250ml	-	-	-	8270D PAH SIM	↓	↓
	1	PE	250ml	HNO3	-	-	Flo		
	3	CG	40ml	HCl	-	-	8260B Aroma		
	2	CG	40ml	↓	-	-	8260B Aroma Soil EDB		

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Manatee county - orlando ave	SITE LOCATION: Bradenton, FL	
WELL NO: SB-2	SAMPLE ID:	DATE: 10-24-17

PURGING DATA

WELL DIAMETER (inches): 2"	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to 5 feet 9	STATIC DEPTH TO WATER (feet): -	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): ~~6.5~~ 7	FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~6.5~~ 7	PURGING INITIATED AT: 1120	PURGING ENDED AT: 1205	TOTAL VOLUME PURGED (gallons): 3.15

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1150	2.10	2.10	0.07	-	6.98	30.16	751	0.08/1.0	40.1	clear	-107.3
1153	0.21	2.31	↓	-	6.98	30.10	752	0.08/1.1	23.9	↓	-107.0
1156	0.21	2.52		-	6.98	30.08	753	0.06/0.9	31.7		-106.3
1159	0.21	2.73		-	6.98	30.10	753	0.07/0.9	19.3		-106.0
1202	0.21	2.94		-	6.98	30.12	753	0.06/0.8	16.9		-106.0
1205	0.21	3.15	↓	-	6.98	30.06	753	0.07/0.9	14.7	↓	-105.8

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Anthony Hall	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1207	SAMPLING ENDED AT: 1214
PUMP OR TUBING DEPTH IN WELL (feet): ~~6.5~~ 7	TUBING MATERIAL CODE: HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	2	AG	250ml	H2SO4	-	-	FloPro	APP	250
	1	AG	250ml	-	-	-	82710 PAH SIM	↓	↓
	1	PE	250ml	HNO3	-	-	PD		
	3	CG	40ml	HCl	-	-	82608 Arom		
	2	CG	40ml	-	-	-	82608 Arom 8011 EDB		

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: SB-3 Manatee county - orlando ave	SITE LOCATION: Bradenton, FL	
WELL NO: SB-3	SAMPLE ID:	DATE: 10-24-17

PURGING DATA

WELL DIAMETER (inches): 1"	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to 5 feet 9	STATIC DEPTH TO WATER (feet): -	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5	PURGING INITIATED AT: 1030	PURGING ENDED AT: 1106	TOTAL VOLUME PURGED (gallons): 2.52

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (Deg C)	COND. µmhos/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1100	2.10	2.10	0.07	-	6.82	30.30	697	0.10 / 1.4	14.7	clear	-75.5
1103	0.21	2.31	↓	-	6.83	29.98	697	0.10 / 1.3	11.6	↓	-76.1
1106	0.21	2.52	↓	-	6.83	29.98	697	0.11 / 1.4	9.24	↓	-76.5

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Anthony Hall PSI	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1108	SAMPLING ENDED AT: 1115
PUMP OR TUBING DEPTH IN WELL (feet): 5	TUBING MATERIAL CODE: HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	2	AG	250ml	H_2SO_4	-	-	FloPro	APP	250
	1	AG	250ml	-	-	-	82700 1,4 D SIM	↓	
	1	PE	250ml	HNO_3	-	-	Pb		
	3	CG	40ml	HCl	-	-	8260B Aroms		
	2	CG	40ml	-	-	-	8260B Aroms		
							8011 EDB		

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

ENVIRONMENTAL CONSERVATION LABORATORIES — CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
Jacksonville, FL 32216-6069
(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

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Page 1 of 1

Client Name: PSI - Tampa (PS003)	Project Number: 05522422
Address: 5801 Benjamin Center Drive Suite 112	Project Name/Desc: Manatee County - Orlando Avenue
City/ST/Zip: Tampa, FL 33634	PO # / Billing Info:
Tel: (813) 886-1075 Fax: (813) 888-6514	Reporting Contact: Sean Barnes
Sampler(s) Name, Affiliation (Print): [illegible] PSI	Billing Contact: Accounts Payable
Sampler(s) Signature:	Site Location / Time Zone:

Requested Analyses

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

___ Standard

___ Expedited

Due ___/___/___

Lab Workorder

AA07479

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	8011 EDB (Water)	8260B EDB (Soil)	8260B Arom	8270D PAH SIM	FLPRO	Pb	6010 / Pb	Preservation (See Codes) (Combine as necessary)	Sample Comments
	SB-1, 2-3'	10/2/17	1130	Comp	SO	5	X	X		X	X		X		
	SB-2, 2-3'		1055			5	X	X		X	X		X		
	SB-2 6-7		1105			5	X	X		X	X		X		
	SB-3, 2 3		1030			5	X	X		X	X		X		

<-- Total # of Containers

Sample Kit Prepared By: ECG	Date/Time: 10/19/17 12:20	Relinquished By: [signature]	Date/Time: 10/19/17 12:20	Received By: [signature] PST	Date/Time: 10/24/17
Comments/Special Reporting Requirements:		Relinquished By:	Date/Time:	Received By: [signature]	Date/Time: 10/24/17 1445
		Relinquished By:	Date/Time:	Received By:	Date/Time:
		Cooler #'s & Temps on Receipt:		Condition Upon Receipt: ___ Acceptable ___ Unacceptable	

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

ENVIRONMENTAL CONSERVATION LABORATORIES — CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
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102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

www.encolabs.com

Client Name: PSI - Tampa (PS003)	Project Number: 05522422
Address: 5801 Benjamin Center Drive Suite 112	Project Name/Desc: Manatee County - Orlando Avenue
City/ST/Zip: Tampa, FL 33634	PO # / Billing Info
Tel: (813) 886-1075 Fax: (813) 888-8514	Reporting Contact: Sean Barnes
Sampler(s) Name, Affiliation (Print): Anthony Hall PSI	Billing Contact: Accounts Payable
Sampler(s) Signature	Site Location / Time Zone

Requested Analyses

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

✓ Standard

___ Expedited

Due ___/___/___

Lab Workorder: AA07479

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	8011 EDB (Water)	8260B EDB (Soil)	8260B Arom	8270D PAH SIM	FLPRO	Pb	Sample Comments
	SB-1	10-24-17	1308	Grab	GW	9	X		X	X	X	X	
	SB-2	10-24-17	1207	Grab	GW	9	X		X	X	X	X	
	SB-3	10-24-17	1108	Grab	GW	9	X		X	X	X	X	

Preservation (See Codes) (Combine as necessary)

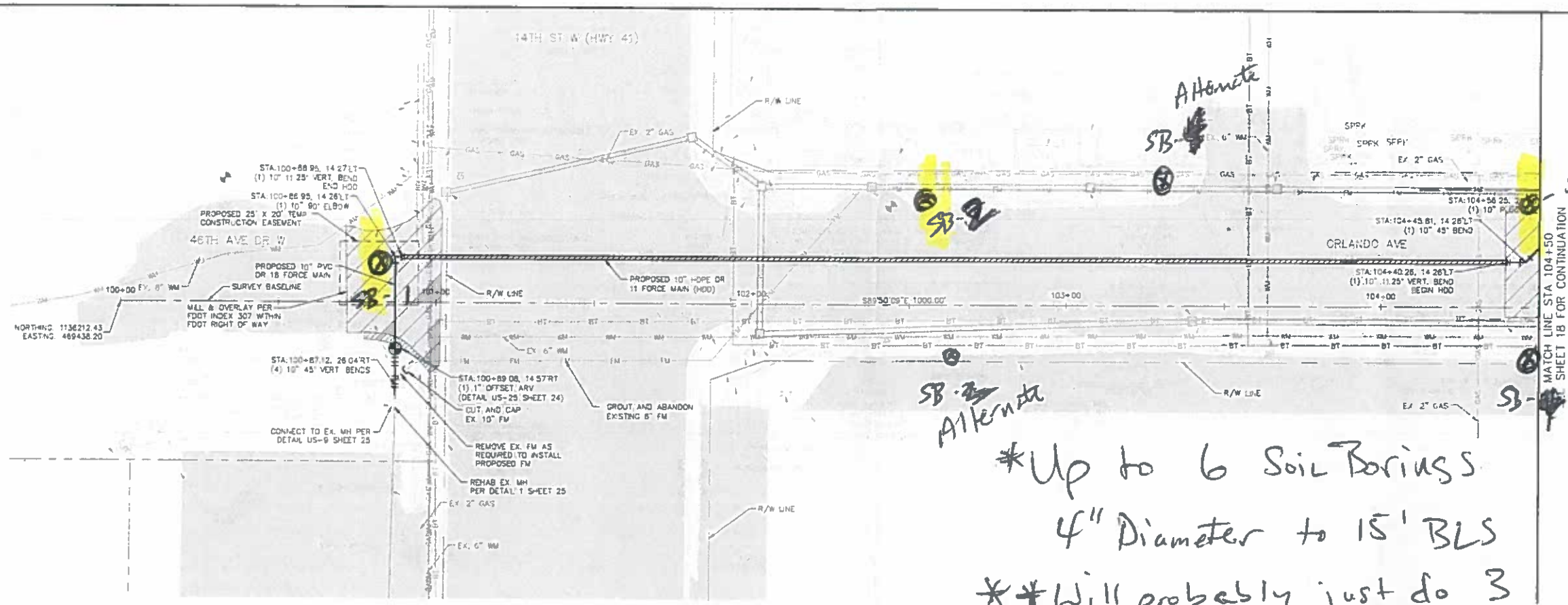
<-- Total # of Containers

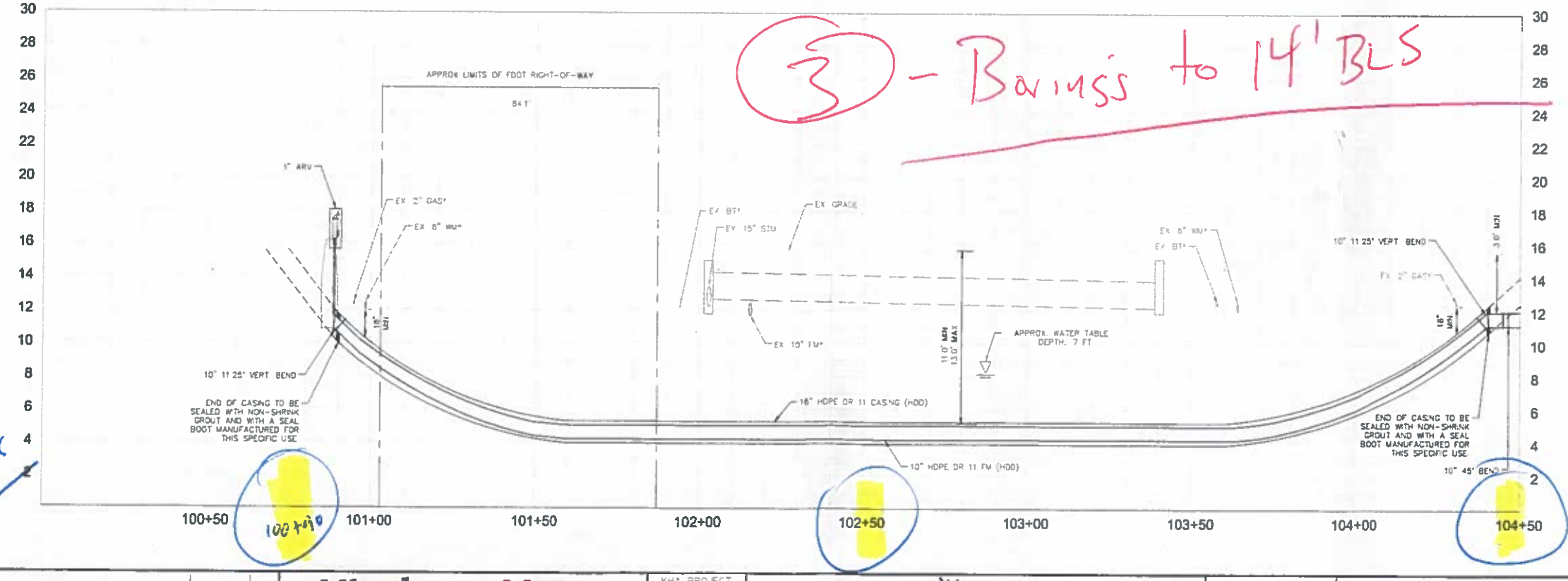
Sample Kit Prepared By: ECG	Date/Time: 10/19/17 12:20	Relinquished By	Date/Time: 10/19/17 12:20	Received By	Date/Time: 10-24-17 0705
Comments/Special Reporting Requirements	Relinquished By	Date/Time: 10-24-17 1445	Received By	Date/Time: 10/24/17 1445
	Relinquished By	Date/Time	Received By	Date/Time
	Cooler #'s & Temps on Receipt		Condition Upon Receipt: ___ Acceptable ___ Unacceptable	

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist





NORTH

GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL SCALE 1"=20'
VERTICAL SCALE 1"=4'

(6) Soil Borings Locations

LEGEND
- REMOVE & REPLACE SIDEWALK
- ROADWAY RESTORATION
- REMOVE & REPLACE CURB

NOTES
1. CONTRACTOR TO FOLLOW RESTRAINED LENGTHS SET IN RESTRAIN LENGTH DETAILS ON SHEET 24 & 25.
2. CONSTRUCTION DEWATERING SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO CHAPTERS 62-621.300 AND 62-620 OF THE FLORIDA ADMINISTRATIVE CODE (FAC)
3. REFER TO DETAIL UG-12 SHEET 23 FOR COUNTY ROADWAY REPAIR REQUIREMENTS

*NOTES.
THE ELEVATIONS OF THE UTILITIES MARKED WITH AN ASTERISK (*) HAVE BEEN ASSUMED ON THE BASIS OF TYPICAL ANTICIPATED 50% COVERAGE. CONTRACTOR SHALL NOT RELY ON THIS INFORMATION FOR CONSTRUCTION, BUT SHALL BE RESPONSIBLE FOR FIELD LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL UTILITIES CROSSING THE PROPOSED FORCE MAIN. CONTRACTOR SHALL INCLUDE IN THE UNIT COST OF THE SUBJECT FORCE MAIN CONSTRUCTION, THE COST OF UTILITY ADJUSTMENTS NECESSARY TO ATTAIN DESIGN MINIMUM SEPARATION FOR UTILITIES CONFLICTING WITH THE CONSTRUCTION OF THE PROPOSED FORCE MAIN. INTERRUPTIONS OF ANY EXISTING UTILITY SERVICES SHALL BE NOTIFIED TO EFFECTED CUSTOMERS A MINIMUM OF 48 HOURS IN ADVANCE AND SHALL NOT EXCEED 4 HOURS IN DURATION.

WHERE CONCRETE REPAIRS ARE NECESSARY AND EXPANSION JOINTS ARE PRESENT, CONTRACTOR TO REMOVE AND REPLACE CONCRETE UP TO THE NEXT EXPANSION JOINT; OTHERWISE, REPLACE CONCRETE AS NECESSARY.

GROUNDWATER / DEWATERING NOTE:
THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS.

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2017 KIMLEY-HORN AND ASSOCIATES, INC.
655 NORTH FRANKLIN STREET, SUITE 150, TAMPA, FL 33602
PHONE: 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400016
DATE	6/22/2017
SCALE	AS SHOWN
DESIGNED BY	WWW
DRAWN BY	JRT
CHECKED BY	WEW

Manatee County FLORIDA

END OF SERVICE LIFE
PACKAGE B: FM 15/ FM 1/ ORLANDO AVE.
MANATEE COUNTY FL

LICENSED PROFESSIONAL
W. WADE WOOD, P.E.
FL LICENSE NUMBER
69051
DATE

PLAN AND PROFILE
ORLANDO AVENUE

SHEET NUMBER
17

ATTACHMENT C
LABORATORY REPORT

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Wednesday, November 8, 2017
PSI - Tampa (PS003)
Attn: Sean Barnes
5801 Benjamin Center Drive Suite 112
Tampa, FL 33634

RE: Laboratory Results for
Project Number: 05522422, Project Name/Desc: Manatee County - Orlando Avenue
ENCO Workorder(s): AA07638

Dear Sean Barnes,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Wednesday, October 25, 2017.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Carlene S. Pasipanki

Carlene S Pasipanki For Cassie B. Puryear

Project Manager

Enclosure(s)

Please note: SB-1, 6-7' is actually SB-2, 6-7'

www.encolabs.com

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: SB-1, 2-3' **Lab ID: AA07638-01** **Sampled: 10/24/17 11:30** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/22/18		10/26/17	12:04	10/27/17 11:12
EPA 8260B	EPA 5035_MS	11/07/17		10/30/17	13:18	10/31/17 00:03
EPA 8270D	SOP EXSV-33	11/07/17	12/07/17	10/28/17	12:35	10/30/17 21:37

Client ID: SB-1, 2-3' **Lab ID: AA07638-01RE1** **Sampled: 10/24/17 11:30** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/07/17	12/12/17	11/02/17	13:20	11/03/17 19:13

Client ID: SB-1, 6-7' **Lab ID: AA07638-03** **Sampled: 10/24/17 11:05** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/22/18		10/26/17	12:04	10/27/17 11:14
EPA 8260B	EPA 5035_MS	11/07/17		10/30/17	13:18	10/31/17 00:31
EPA 8270D	SOP EXSV-33	11/07/17	12/07/17	10/28/17	12:35	10/30/17 21:59

Client ID: SB-1, 6-7' **Lab ID: AA07638-03RE1** **Sampled: 10/24/17 11:05** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/07/17	12/12/17	11/02/17	13:20	11/03/17 19:47

Client ID: SB-3, 2-3' **Lab ID: AA07638-04** **Sampled: 10/24/17 10:30** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3050B	04/22/18		10/26/17	12:04	10/27/17 11:18
EPA 8260B	EPA 5035_MS	11/07/17		10/30/17	13:18	10/31/17 00:59
EPA 8270D	SOP EXSV-33	11/07/17	12/07/17	10/28/17	12:35	10/30/17 22:21

Client ID: SB-3, 2-3' **Lab ID: AA07638-04RE1** **Sampled: 10/24/17 10:30** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
FL-PRO	EPA 3550C	11/07/17	12/12/17	11/02/17	13:20	11/03/17 20:20

Client ID: TRIP BLANK **Lab ID: AA07638-05** **Sampled: 10/24/17 00:00** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8260B	EPA 5030B_MS	11/07/17		10/31/17	00:00	10/31/17 15:49

SAMPLE DETECTION SUMMARY

Client ID: SB-1, 2-3' **Lab ID:** AA07638-01

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Lead - Total	5.00		0.410	0.891	mg/kg dry	EPA 6010C	

Client ID: SB-1, 6-7' **Lab ID:** AA07638-03

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Benzo(a)anthracene	0.052		0.016	0.041	mg/kg dry	EPA 8270D	
Benzo(a)pyrene	0.019	I	0.018	0.041	mg/kg dry	EPA 8270D	
Benzo(b)fluoranthene	0.026	I	0.020	0.041	mg/kg dry	EPA 8270D	
Fluoranthene	0.040	I	0.020	0.041	mg/kg dry	EPA 8270D	
Pyrene	0.045		0.019	0.041	mg/kg dry	EPA 8270D	

Client ID: SB-3, 2-3' **Lab ID:** AA07638-04

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Lead - Total	1.29		0.511	1.11	mg/kg dry	EPA 6010C	

ANALYTICAL RESULTS

Description: SB-1, 2-3' | **Lab Sample ID:** AA07638-01 | **Received:** 10/25/17 08:00

Matrix: Soil | **Sampled:** 10/24/17 11:30 | **Work Order:** AA07638

Project: Manatee County - Orlando Avenue | **Sampled By:** Anthony Hall | **% Solids:** 87.71

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2-Dibromoethane [106-93-4]^	0.00076	U	mg/kg dry	1	0.00076	0.0011	7J30043	EPA 8260B	10/31/17 00:03	KKW	
Benzene [71-43-2]^	0.00046	U	mg/kg dry	1	0.00046	0.0011	7J30043	EPA 8260B	10/31/17 00:03	KKW	
Ethylbenzene [100-41-4]^	0.00066	U	mg/kg dry	1	0.00066	0.0011	7J30043	EPA 8260B	10/31/17 00:03	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0013	U	mg/kg dry	1	0.0013	0.0023	7J30043	EPA 8260B	10/31/17 00:03	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00072	U	mg/kg dry	1	0.00072	0.0011	7J30043	EPA 8260B	10/31/17 00:03	KKW	
o-Xylene [95-47-6]^	0.00064	U	mg/kg dry	1	0.00064	0.0011	7J30043	EPA 8260B	10/31/17 00:03	KKW	
Toluene [108-88-3]^	0.00054	U	mg/kg dry	1	0.00054	0.0011	7J30043	EPA 8260B	10/31/17 00:03	KKW	
Xylenes (Total) [1330-20-7]^	0.0011	U	mg/kg dry	1	0.0011	0.0023	7J30043	EPA 8260B	10/31/17 00:03	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.057*	*1*	*0.0540*	*105 %*	*70-130*	*7J30043*	*EPA 8260B*	*10/31/17 00:03*	*KKW*	
Dibromofluoromethane	*0.052*	*1*	*0.0540*	*96 %*	*70-133*	*7J30043*	*EPA 8260B*	*10/31/17 00:03*	*KKW*	
Toluene-d8	*0.056*	*1*	*0.0540*	*104 %*	*70-130*	*7J30043*	*EPA 8260B*	*10/31/17 00:03*	*KKW*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.022	U	mg/kg dry	1	0.022	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
2-Methylnaphthalene [91-57-6]^	0.021	U	mg/kg dry	1	0.021	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Acenaphthene [83-32-9]^	0.017	U	mg/kg dry	1	0.017	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Acenaphthylene [208-96-8]^	0.021	U	mg/kg dry	1	0.021	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Anthracene [120-12-7]^	0.016	U	mg/kg dry	1	0.016	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Benzo(a)anthracene [56-55-3]^	0.016	U	mg/kg dry	1	0.016	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Benzo(a)pyrene [50-32-8]^	0.017	U	mg/kg dry	1	0.017	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.019	U	mg/kg dry	1	0.019	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.017	U	mg/kg dry	1	0.017	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.022	U	mg/kg dry	1	0.022	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Chrysene [218-01-9]^	0.014	U	mg/kg dry	1	0.014	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.018	U	mg/kg dry	1	0.018	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Fluoranthene [206-44-0]^	0.019	U	mg/kg dry	1	0.019	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Fluorene [86-73-7]^	0.019	U	mg/kg dry	1	0.019	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.017	U	mg/kg dry	1	0.017	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Naphthalene [91-20-3]^	0.021	U	mg/kg dry	1	0.021	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Phenanthrene [85-01-8]^	0.017	U	mg/kg dry	1	0.017	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	
Pyrene [129-00-0]^	0.018	U	mg/kg dry	1	0.018	0.040	7J28002	EPA 8270D	10/30/17 21:37	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.0*	*1*	*2.31*	*87 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/30/17 21:37*	*jfi*	

ANALYTICAL RESULTS

Description: SB-1, 2-3' | **Lab Sample ID:** AA07638-01 | **Received:** 10/25/17 08:00

Matrix: Soil | **Sampled:** 10/24/17 11:30 | **Work Order:** AA07638

Project: Manatee County - Orlando Avenue | **Sampled By:** Anthony Hall | **% Solids:** 87.71

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	3.9	U	mg/kg dry	1	3.9	6.5	7K02020	FL-PRO	11/03/17 19:13	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*1.5*	*1*	*3.85*	*39 %*	*60-118*	*7K02020*	*FL-PRO*	*11/03/17 19:13*	*JJB*	*QS-07*
o-Terphenyl	*1.6*	*1*	*1.93*	*82 %*	*62-109*	*7K02020*	*FL-PRO*	*11/03/17 19:13*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Lead [7439-92-1]^	**5.00**		mg/kg dry	1	0.410	0.891	7J26004	EPA 6010C	10/27/17 11:12	ACV	

Please note: This sample is actually SB-2, 6-7'

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ANALYTICAL RESULTS

Description: SB-1, 6-7' | **Lab Sample ID:** AA07638-03 | **Received:** 10/25/17 08:00

Matrix: Soil | **Sampled:** 10/24/17 11:05 | **Work Order:** AA07638

Project: Manatee County - Orlando Avenue | **Sampled By:** Anthony Hall | **% Solids:** 85.05

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2-Dibromoethane [106-93-4]^	0.079	U	mg/kg dry	100	0.079	0.12	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05
Benzene [71-43-2]^	0.047	U	mg/kg dry	100	0.047	0.12	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05
Ethylbenzene [100-41-4]^	0.068	U	mg/kg dry	100	0.068	0.12	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05
m,p-Xylenes [108-38-3/106-42-3]^	0.13	U	mg/kg dry	100	0.13	0.24	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05
Methyl-tert-Butyl Ether [1634-04-4]^	0.074	U	mg/kg dry	100	0.074	0.12	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05
o-Xylene [95-47-6]^	0.066	U	mg/kg dry	100	0.066	0.12	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05
Toluene [108-88-3]^	0.055	U	mg/kg dry	100	0.055	0.12	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05
Xylenes (Total) [1330-20-7]^	0.12	U	mg/kg dry	100	0.12	0.24	7J30043	EPA 8260B	10/31/17 00:31	KKW	R-05

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.068*	*1*	*0.0636*	*107 %*	*70-130*	*7J30043*	*EPA 8260B*	*10/31/17 00:31*	*KKW*	
Dibromofluoromethane	*0.060*	*1*	*0.0636*	*95 %*	*70-133*	*7J30043*	*EPA 8260B*	*10/31/17 00:31*	*KKW*	
Toluene-d8	*0.066*	*1*	*0.0636*	*103 %*	*70-130*	*7J30043*	*EPA 8260B*	*10/31/17 00:31*	*KKW*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.022	U	mg/kg dry	1	0.022	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
2-Methylnaphthalene [91-57-6]^	0.021	U	mg/kg dry	1	0.021	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Acenaphthene [83-32-9]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Acenaphthylene [208-96-8]^	0.021	U	mg/kg dry	1	0.021	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Anthracene [120-12-7]^	0.016	U	mg/kg dry	1	0.016	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Benzo(a)anthracene [56-55-3]^	**0.052**		mg/kg dry	1	0.016	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Benzo(a)pyrene [50-32-8]^	**0.019**	I	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Benzo(b)fluoranthene [205-99-2]^	**0.026**	I	mg/kg dry	1	0.020	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.022	U	mg/kg dry	1	0.022	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Chrysene [218-01-9]^	0.014	U	mg/kg dry	1	0.014	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.019	U	mg/kg dry	1	0.019	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Fluoranthene [206-44-0]^	**0.040**	I	mg/kg dry	1	0.020	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Fluorene [86-73-7]^	0.020	U	mg/kg dry	1	0.020	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Naphthalene [91-20-3]^	0.021	U	mg/kg dry	1	0.021	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Phenanthrene [85-01-8]^	0.018	U	mg/kg dry	1	0.018	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	
Pyrene [129-00-0]^	**0.045**		mg/kg dry	1	0.019	0.041	7J28002	EPA 8270D	10/30/17 21:59	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.1*	*1*	*2.35*	*90 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/30/17 21:59*	*jfi*	

Please note: This sample is actually SB-2, 6-7'

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ANALYTICAL RESULTS

Description: SB-1, 6-7'	**Lab Sample ID:** AA07638-03	**Received:** 10/25/17 08:00
Matrix: Soil	**Sampled:** 10/24/17 11:05	**Work Order:** AA07638
Project: Manatee County - Orlando Avenue	**Sampled By:** Anthony Hall	**% Solids:** 85.05

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.0	U	mg/kg dry	1	4.0	6.7	7K02020	FL-PRO	11/03/17 19:47	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*1.6*	*1*	*3.95*	*41 %*	*60-118*	*7K02020*	*FL-PRO*	*11/03/17 19:47*	*JJB*	*QS-07*
o-Terphenyl	*1.4*	*1*	*1.98*	*72 %*	*62-109*	*7K02020*	*FL-PRO*	*11/03/17 19:47*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Lead [7439-92-1]^	0.443	U	mg/kg dry	1	0.443	0.964	7J26004	EPA 6010C	10/27/17 11:14	ACV	

ANALYTICAL RESULTS

Description: SB-3, 2-3' | **Lab Sample ID:** AA07638-04 | **Received:** 10/25/17 08:00

Matrix: Soil | **Sampled:** 10/24/17 10:30 | **Work Order:** AA07638

Project: Manatee County - Orlando Avenue | **Sampled By:** Anthony Hall | **% Solids:** 80.30

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2-Dibromoethane [106-93-4]^	0.00064	U	mg/kg dry	1	0.00064	0.00096	7J30043	EPA 8260B	10/31/17 00:59	KKW	
Benzene [71-43-2]^	0.00038	U	mg/kg dry	1	0.00038	0.00096	7J30043	EPA 8260B	10/31/17 00:59	KKW	
Ethylbenzene [100-41-4]^	0.00056	U	mg/kg dry	1	0.00056	0.00096	7J30043	EPA 8260B	10/31/17 00:59	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	0.0011	U	mg/kg dry	1	0.0011	0.0019	7J30043	EPA 8260B	10/31/17 00:59	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.00060	U	mg/kg dry	1	0.00060	0.00096	7J30043	EPA 8260B	10/31/17 00:59	KKW	
o-Xylene [95-47-6]^	0.00054	U	mg/kg dry	1	0.00054	0.00096	7J30043	EPA 8260B	10/31/17 00:59	KKW	
Toluene [108-88-3]^	0.00045	U	mg/kg dry	1	0.00045	0.00096	7J30043	EPA 8260B	10/31/17 00:59	KKW	
Xylenes (Total) [1330-20-7]^	0.00095	U	mg/kg dry	1	0.00095	0.0019	7J30043	EPA 8260B	10/31/17 00:59	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*0.049*	*1*	*0.0479*	*102 %*	*70-130*	*7J30043*	*EPA 8260B*	*10/31/17 00:59*	*KKW*	
Dibromofluoromethane	*0.046*	*1*	*0.0479*	*95 %*	*70-133*	*7J30043*	*EPA 8260B*	*10/31/17 00:59*	*KKW*	
Toluene-d8	*0.049*	*1*	*0.0479*	*103 %*	*70-130*	*7J30043*	*EPA 8260B*	*10/31/17 00:59*	*KKW*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.024	U	mg/kg dry	1	0.024	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
2-Methylnaphthalene [91-57-6]^	0.022	U	mg/kg dry	1	0.022	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Acenaphthene [83-32-9]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Acenaphthylene [208-96-8]^	0.022	U	mg/kg dry	1	0.022	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Anthracene [120-12-7]^	0.017	U	mg/kg dry	1	0.017	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Benzo(a)anthracene [56-55-3]^	0.017	U	mg/kg dry	1	0.017	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Benzo(a)pyrene [50-32-8]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.024	U	mg/kg dry	1	0.024	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Chrysene [218-01-9]^	0.015	U	mg/kg dry	1	0.015	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.020	U	mg/kg dry	1	0.020	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Fluoranthene [206-44-0]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Fluorene [86-73-7]^	0.021	U	mg/kg dry	1	0.021	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Naphthalene [91-20-3]^	0.022	U	mg/kg dry	1	0.022	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Phenanthrene [85-01-8]^	0.019	U	mg/kg dry	1	0.019	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	
Pyrene [129-00-0]^	0.020	U	mg/kg dry	1	0.020	0.044	7J28002	EPA 8270D	10/30/17 22:21	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*2.2*	*1*	*2.56*	*85 %*	*50-150*	*7J28002*	*EPA 8270D*	*10/30/17 22:21*	*jfi*	

ANALYTICAL RESULTS

Description: SB-3, 2-3' **Lab Sample ID:** AA07638-04 **Received:** 10/25/17 08:00
Matrix: Soil **Sampled:** 10/24/17 10:30 **Work Order:** AA07638
Project: Manatee County - Orlando Avenue **Sampled By:** Anthony Hall **% Solids:** 80.30

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	4.2	U	mg/kg dry	1	4.2	7.1	7K02020	FL-PRO	11/03/17 20:20	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*1.8*	*1*	*4.10*	*45 %*	*60-118*	*7K02020*	*FL-PRO*	*11/03/17 20:20*	*JJB*	*QS-07*
o-Terphenyl	*1.9*	*1*	*2.06*	*91 %*	*62-109*	*7K02020*	*FL-PRO*	*11/03/17 20:20*	*JJB*	

Metals by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Lead [7439-92-1]^	**1.29**		mg/kg dry	1	0.511	1.11	7J26004	EPA 6010C	10/27/17 11:18	ACV	

Description: TRIP BLANK **Lab Sample ID:** AA07638-05 **Received:** 10/25/17 08:00
Matrix: Water **Sampled:** 10/24/17 00:00 **Work Order:** AA07638
Project: Manatee County - Orlando Avenue **Sampled By:** ENCO

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	1.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 15:49	NLM	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*103 %*	*41-142*	*7J31014*	*EPA 8260B*	*10/31/17 15:49*	*NLM*	
Dibromofluoromethane	*50*	*1*	*50.0*	*101 %*	*53-146*	*7J31014*	*EPA 8260B*	*10/31/17 15:49*	*NLM*	
Toluene-d8	*55*	*1*	*50.0*	*110 %*	*41-146*	*7J31014*	*EPA 8260B*	*10/31/17 15:49*	*NLM*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7J30043 - EPA 5035_MS

Blank (7J30043-BLK1) Prepared: 10/30/2017 00:00 Analyzed: 10/30/2017 22:38

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.00067	U	0.0010	mg/kg wet							
Benzene	0.00040	U	0.0010	mg/kg wet							
Ethylbenzene	0.00058	U	0.0010	mg/kg wet							
m,p-Xylenes	0.0011	U	0.0020	mg/kg wet							
Methyl-tert-Butyl Ether	0.00063	U	0.0010	mg/kg wet							
o-Xylene	0.00056	U	0.0010	mg/kg wet							
Toluene	0.00047	U	0.0010	mg/kg wet							
Xylenes (Total)	0.00099	U	0.0020	mg/kg wet							
4-Bromofluorobenzene	*0.051*			*mg/kg wet*	*0.0500*		*102*	*70-130*			
Dibromofluoromethane	*0.049*			*mg/kg wet*	*0.0500*		*98*	*70-133*			
Toluene-d8	*0.051*			*mg/kg wet*	*0.0500*		*103*	*70-130*			

LCS (7J30043-BS1) Prepared: 10/30/2017 00:00 Analyzed: 10/30/2017 20:45

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.017		0.0010	mg/kg wet	0.0200		84	52-145			
Benzene	0.017		0.0010	mg/kg wet	0.0200		87	49-142			
Toluene	0.016		0.0010	mg/kg wet	0.0200		81	55-136			
4-Bromofluorobenzene	*0.052*			*mg/kg wet*	*0.0500*		*105*	*70-130*			
Dibromofluoromethane	*0.051*			*mg/kg wet*	*0.0500*		*103*	*70-133*			
Toluene-d8	*0.052*			*mg/kg wet*	*0.0500*		*104*	*70-130*			

LCS Dup (7J30043-BSD1) Prepared: 10/30/2017 00:00 Analyzed: 10/30/2017 21:13

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.018		0.0010	mg/kg wet	0.0200		90	52-145	7	36	QM-10
Benzene	0.017		0.0010	mg/kg wet	0.0200		87	49-142	0	19	QM-10
Toluene	0.016		0.0010	mg/kg wet	0.0200		81	55-136	0.1	21	QM-10
4-Bromofluorobenzene	*0.052*			*mg/kg wet*	*0.0500*		*105*	*70-130*			*QM-10*
Dibromofluoromethane	*0.050*			*mg/kg wet*	*0.0500*		*100*	*70-133*			*QM-10*
Toluene-d8	*0.052*			*mg/kg wet*	*0.0500*		*104*	*70-130*			*QM-10*

Batch 7J31014 - EPA 5030B_MS

Blank (7J31014-BLK1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 13:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.78	U	1.0	ug/L							
Benzene	0.71	U	1.0	ug/L							
Ethylbenzene	0.69	U	1.0	ug/L							
m,p-Xylenes	1.3	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.60	U	1.0	ug/L							
o-Xylene	0.53	U	1.0	ug/L							
Toluene	0.72	U	1.0	ug/L							
Xylenes (Total)	1.3	U	2.0	ug/L							
4-Bromofluorobenzene	*48*			*ug/L*	*50.0*		*96*	*41-142*			
Dibromofluoromethane	*49*			*ug/L*	*50.0*		*98*	*53-146*			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7J31014 - EPA 5030B_MS - Continued

Blank (7J31014-BLK1) Continued Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 13:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Toluene-d8	*51*			*ug/L*	*50.0*		*101*	*41-146*			

LCS (7J31014-BS1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 10:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	18		1.0	ug/L	20.0		90	57-140			
Benzene	15		1.0	ug/L	20.0		76	56-136			
Toluene	17		1.0	ug/L	20.0		83	64-131			
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*105*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

Matrix Spike (7J31014-MS1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 11:22

Source: AA06392-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	22		1.0	ug/L	20.0	0.78 U	112	57-140			
Benzene	23		1.0	ug/L	20.0	4.6	91	56-136			
Toluene	24		1.0	ug/L	20.0	3.1	106	64-131			
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*103*	*41-142*			
Dibromofluoromethane	*49*			*ug/L*	*50.0*		*98*	*53-146*			
Toluene-d8	*50*			*ug/L*	*50.0*		*100*	*41-146*			

Matrix Spike Dup (7J31014-MSD1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 11:51

Source: AA06392-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	23		1.0	ug/L	20.0	0.78 U	115	57-140	2	16	
Benzene	24		1.0	ug/L	20.0	4.6	100	56-136	7	14	
Toluene	25		1.0	ug/L	20.0	3.1	111	64-131	4	16	
4-Bromofluorobenzene	*54*			*ug/L*	*50.0*		*109*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*54*			*ug/L*	*50.0*		*107*	*41-146*			

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J28002 - SOP EXSV-33

Blank (7J28002-BLK1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 17:58

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1-Methylnaphthalene	0.019	U	0.035	mg/kg wet							
2-Methylnaphthalene	0.018	U	0.035	mg/kg wet							
Acenaphthene	0.015	U	0.035	mg/kg wet							
Acenaphthylene	0.018	U	0.035	mg/kg wet							
Anthracene	0.014	U	0.035	mg/kg wet							
Benzo(a)anthracene	0.014	U	0.035	mg/kg wet							
Benzo(a)pyrene	0.015	U	0.035	mg/kg wet							
Benzo(b)fluoranthene	0.017	U	0.035	mg/kg wet							
Benzo(g,h,i)perylene	0.015	U	0.035	mg/kg wet							

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J28002 - SOP EXSV-33 - Continued

Blank (7J28002-BLK1) Continued Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 17:58

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(k)fluoranthene	0.019	U	0.035	mg/kg wet							
Chrysene	0.012	U	0.035	mg/kg wet							
Dibenzo(a,h)anthracene	0.016	U	0.035	mg/kg wet							
Fluoranthene	0.017	U	0.035	mg/kg wet							
Fluorene	0.017	U	0.035	mg/kg wet							
Indeno(1,2,3-cd)pyrene	0.015	U	0.035	mg/kg wet							
Naphthalene	0.018	U	0.035	mg/kg wet							
Phenanthrene	0.015	U	0.035	mg/kg wet							
Pyrene	0.016	U	0.035	mg/kg wet							
p-Terphenyl	*1.9*			*mg/kg wet*	*2.00*		*95*	*50-150*			

LCS (7J28002-BS1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 18:20

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	1.6		0.035	mg/kg wet	2.00		80	43-121			
Benzo(a)pyrene	1.8		0.035	mg/kg wet	2.00		88	58-120			
Benzo(g,h,i)perylene	1.7		0.035	mg/kg wet	2.00		84	58-124			
Naphthalene	1.7		0.035	mg/kg wet	2.00		83	37-120			
p-Terphenyl	*1.9*			*mg/kg wet*	*2.00*		*93*	*50-150*			

Matrix Spike (7J28002-MS1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 18:42

Source: AA07547-04

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	2.0		0.046	mg/kg dry	2.53	0.020 U	78	43-121			
Benzo(a)pyrene	2.2		0.046	mg/kg dry	2.53	0.020 U	88	58-120			
Benzo(g,h,i)perylene	2.1		0.046	mg/kg dry	2.53	0.026	82	58-124			
Naphthalene	2.5		0.046	mg/kg dry	2.53	0.023 U	98	37-120			
p-Terphenyl	*2.3*			*mg/kg dry*	*2.53*		*89*	*50-150*			

Matrix Spike Dup (7J28002-MSD1) Prepared: 10/28/2017 12:35 Analyzed: 10/30/2017 19:04

Source: AA07547-04

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	1.9		0.046	mg/kg dry	2.58	0.020 U	72	43-121	6	30	
Benzo(a)pyrene	2.1		0.046	mg/kg dry	2.58	0.020 U	83	58-120	4	30	
Benzo(g,h,i)perylene	2.0		0.046	mg/kg dry	2.58	0.026	78	58-124	3	30	
Naphthalene	2.3		0.046	mg/kg dry	2.58	0.023 U	89	37-120	7	30	
p-Terphenyl	*2.2*			*mg/kg dry*	*2.58*		*86*	*50-150*			

FL Petroleum Range Organics - Quality Control

Batch 7J30017 - SOP EXSV-33

Blank (7J30017-BLK1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 19:45

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	3.4	U	5.7	mg/kg wet							
n-Nonatriacontane	*2.2*			*mg/kg wet*	*3.33*		*66*	*60-118*			

QUALITY CONTROL DATA

FL Petroleum Range Organics - Quality Control

Batch 7J30017 - SOP EXSV-33 - Continued

Blank (7J30017-BLK1) Continued Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 19:45

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Terphenyl	*1.3*			*mg/kg wet*	*1.67*		*75*	*62-109*			

LCS (7J30017-BS1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 20:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	37		5.7	mg/kg wet	56.7		65	63-153			
n-Nonatriacontane	*1.2*			*mg/kg wet*	*3.33*		*35*	*60-118*			*QS-03*
o-Terphenyl	*1.2*			*mg/kg wet*	*1.67*		*70*	*62-109*			

Matrix Spike (7J30017-MS1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 20:48

Source: AA07624-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	35		5.8	mg/kg dry	57.0	3.4 U	61	62-204			QM-07
n-Nonatriacontane	*1.3*			*mg/kg dry*	*3.35*		*38*	*60-118*			*QS-03*
o-Terphenyl	*1.1*			*mg/kg dry*	*1.68*		*67*	*62-109*			

Matrix Spike Dup (7J30017-MSD1) Prepared: 10/30/2017 10:30 Analyzed: 11/01/2017 21:19

Source: AA07624-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	38		5.8	mg/kg dry	56.8	3.4 U	67	62-204	9	25	
n-Nonatriacontane	*1.4*			*mg/kg dry*	*3.34*		*41*	*60-118*			*QS-03*
o-Terphenyl	*1.2*			*mg/kg dry*	*1.68*		*72*	*62-109*			

Batch 7K02020 - SOP EXSV-33

Blank (7K02020-BLK1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 07:34

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	3.4	U	5.7	mg/kg wet							
n-Nonatriacontane	*2.1*			*mg/kg wet*	*3.33*		*64*	*60-118*			
o-Terphenyl	*1.2*			*mg/kg wet*	*1.67*		*75*	*62-109*			

LCS (7K02020-BS1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 07:01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	37		5.7	mg/kg wet	56.7		65	63-153			
n-Nonatriacontane	*2.2*			*mg/kg wet*	*3.33*		*67*	*60-118*			
o-Terphenyl	*1.2*			*mg/kg wet*	*1.67*		*69*	*62-109*			

Matrix Spike (7K02020-MS1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 08:08

Source: AA07699-01RE1

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	49		6.8	mg/kg dry	66.7	4.0 U	73	62-204			
n-Nonatriacontane	*2.9*			*mg/kg dry*	*3.93*		*74*	*60-118*			
o-Terphenyl	*1.6*			*mg/kg dry*	*1.97*		*81*	*62-109*			

QUALITY CONTROL DATA

FL Petroleum Range Organics - Quality Control

Batch 7K02020 - SOP EXSV-33 - Continued

Matrix Spike Dup (7K02020-MSD1) Prepared: 11/02/2017 13:20 Analyzed: 11/03/2017 08:41

Source: AA07699-01RE1

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	55		6.8	mg/kg dry	67.4	4.0 U	81	62-204	12	25	
n-Nonatriacontane	*3.2*			*mg/kg dry*	*3.96*		*81*	*60-118*			
o-Terphenyl	*1.7*			*mg/kg dry*	*1.99*		*86*	*62-109*			

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 7J26004 - EPA 3050B

Blank (7J26004-BLK1) Prepared: 10/26/2017 12:04 Analyzed: 10/27/2017 11:01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	0.359	U	0.781	mg/kg wet							

LCS (7J26004-BS1) Prepared: 10/26/2017 12:04 Analyzed: 10/27/2017 11:03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	34.2		0.658	mg/kg wet	32.9		104	80-120			

Matrix Spike (7J26004-MS1) Prepared: 10/26/2017 12:04 Analyzed: 10/27/2017 11:04

Source: BA04525-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	48.4		0.801	mg/kg dry	40.1	7.67	102	75-125			

Matrix Spike Dup (7J26004-MSD1) Prepared: 10/26/2017 12:04 Analyzed: 10/27/2017 11:06

Source: BA04525-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	50.1		0.824	mg/kg dry	41.2	7.67	103	75-125	3	30	

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*	Not reported due to interference.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-10	LCS/LCSD were analyzed in place of MS/MSD.
QS-03	Surrogate recovery outside acceptance limits
QS-07	Surrogate recovery biased low due to matrix interference confirmed by re-extraction and/or re-analysis.
R-05	The sample was diluted due to the presence of high levels of non-target analytes resulting in elevated reporting limits.

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
Jacksonville, FL 32216-6069
(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

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Client Name: PSI - Tampa (PS003)	Project Number: 05522422
Address: 5801 Benjamin Center Drive Suite 112	Project Name/Desc: Manatee County - Orlando Avenue
City/ST/Zip: Tampa, FL 33634	PO # / Billing Info:
Tel: (813) 886-1075 Fax: (813) 888-6514	Reporting Contact: Sean Barnes
Sampler(s) Name, Affiliation (Print): Anthony Holt PST	Billing Contact: Accounts Payable
Sampler(s) Signature:	Site Location / Time Zone:

Requested Analyses

Preservation (See Codes) (Combine as necessary)

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	8011 EDB (Water)	8260B EDB (Soil)	8260B Arom	8270D PAH SIM	FLPRO	Pb	6010 / Pb				Sample Comments
	SB-1, 2-3'	10-24-17	1130	Comp	SO	5	X	X		X	X		X				
	SB-2, 2-3'		1055			5	X	X		X	X		X				Hold Analyses
	SB-2, 6-7'		1105			5	X	X		X	X		X				
	SB-3, 2-3		1030			5	X	X		X	X		X				

<-- Total # of Containers

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

✓ Standard

___ Expedited

Due ___/___/___

Lab Workorder ~~AA07638~~ AA07479

Sample Kit Prepared By: ECG	Date/Time: 10/19/17 12:20	Relinquished By:	Date/Time: 10/19/17 12:20	Received By: PST	Date/Time: 10-24-17 0700
Comments/Special Reporting Requirements: SB-2, 2-3' on hold until further notice from PSI		Relinquished By:	Date/Time: 10-24-17 1445	Received By:	Date/Time: 10/24/17 1445
		Relinquished By:	Date/Time: 10/24/17 1930	Received By:	Date/Time: 10-25-17 0850
		Cooler #'s & Temps on Receipt: C-23 1.8C		Condition Upon Receipt: ✓ Acceptable ___ Unacceptable	

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Thursday, November 2, 2017
PSI - Tampa (PS003)
Attn: Sean Barnes
5801 Benjamin Center Drive Suite 112
Tampa, FL 33634

RE: Laboratory Results for
Project Number: 05522422, Project Name/Desc: Manatee County - Orlando Avenue
ENCO Workorder(s): AA07479

Dear Sean Barnes,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Wednesday, October 25, 2017.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

David Camacho For Cassie B. Puryear

Project Manager

Enclosure(s)

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: SB-1 **Lab ID: AA07479-01** **Sampled: 10/24/17 13:08** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/22/18		10/27/17	10:29	10/30/17 11:21
EPA 8011	EPA 504/8011	11/07/17		10/26/17	10:00	10/26/17 18:04
EPA 8260B	EPA 5030B_MS	11/07/17		11/01/17	13:59	11/02/17 00:32
EPA 8270D	EPA 3511_MS	10/31/17	12/07/17	10/28/17	06:11	10/31/17 08:52
FL-PRO	EPA 3510C	10/31/17	12/09/17	10/30/17	17:19	11/01/17 04:58

Client ID: SB-2 **Lab ID: AA07479-02** **Sampled: 10/24/17 12:07** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/22/18		10/27/17	10:29	10/30/17 11:23
EPA 8011	EPA 504/8011	11/07/17		10/26/17	10:00	10/26/17 18:20
EPA 8260B	EPA 5030B_MS	11/07/17		11/01/17	13:59	11/02/17 01:01
EPA 8270D	EPA 3511_MS	10/31/17	12/07/17	10/28/17	06:11	10/31/17 09:14
FL-PRO	EPA 3510C	10/31/17	12/09/17	10/30/17	17:19	11/01/17 05:31

Client ID: SB-3 **Lab ID: AA07479-03** **Sampled: 10/24/17 11:08** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)
EPA 6010C	EPA 3005A	04/22/18		10/27/17	10:29	10/30/17 11:24
EPA 8011	EPA 504/8011	11/07/17		10/26/17	10:00	10/26/17 18:36
EPA 8260B	EPA 5030B_MS	11/07/17		11/01/17	13:59	11/02/17 01:30
EPA 8270D	EPA 3511_MS	10/31/17	12/07/17	10/28/17	06:11	10/31/17 09:36
FL-PRO	EPA 3510C	10/31/17	12/09/17	10/30/17	17:19	11/01/17 06:05

Client ID: TRIP BLANK **Lab ID: AA07479-04** **Sampled: 10/24/17 00:00** **Received: 10/25/17 08:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)		Analysis Date/Time(s)
EPA 8260B	EPA 5030B_MS	11/07/17	10/31/17	00:00	10/31/17 15:20

SAMPLE DETECTION SUMMARY

Client ID: SB-3 **Lab ID:** AA07479-03

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Lead - Total	4.53	I	3.80	10.0	ug/L	EPA 6010C	

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ANALYTICAL RESULTS

Description: SB-1 **Lab Sample ID:** AA07479-01 **Received:** 10/25/17 08:00

Matrix: Ground Water **Sampled:** 10/24/17 13:08 **Work Order:** AA07479

Project: Manatee County - Orlando Avenue **Sampled By:** Anthony Hall

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 00:32	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 00:32	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 00:32	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 00:32	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 00:32	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 00:32	KKW	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 00:32	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*48*	*1*	*50.0*	*97 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 00:32*	*KKW*	
Dibromofluoromethane	*51*	*1*	*50.0*	*102 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 00:32*	*KKW*	
Toluene-d8	*51*	*1*	*50.0*	*102 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 00:32*	*KKW*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.047	U	ug/L	1	0.047	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
2-Methylnaphthalene [91-57-6]^	0.044	U	ug/L	1	0.044	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Acenaphthene [83-32-9]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Acenaphthylene [208-96-8]^	0.036	U	ug/L	1	0.036	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Anthracene [120-12-7]^	0.036	U	ug/L	1	0.036	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Benzo(a)anthracene [56-55-3]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Benzo(a)pyrene [50-32-8]^	0.043	U	ug/L	1	0.043	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.059	U	ug/L	1	0.059	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.040	U	ug/L	1	0.040	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.046	U	ug/L	1	0.046	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Chrysene [218-01-9]^	0.051	U	ug/L	1	0.051	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.026	U	ug/L	1	0.026	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Fluoranthene [206-44-0]^	0.051	U	ug/L	1	0.051	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Fluorene [86-73-7]^	0.038	U	ug/L	1	0.038	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Naphthalene [91-20-3]^	0.035	U	ug/L	1	0.035	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Phenanthrene [85-01-8]^	0.039	U	ug/L	1	0.039	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	
Pyrene [129-00-0]^	0.048	U	ug/L	1	0.048	0.10	7J28001	EPA 8270D	10/31/17 08:52	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*4.9*	*1*	*5.71*	*86 %*	*61-151*	*7J28001*	*EPA 8270D*	*10/31/17 08:52*	*jfi*	

Semivolatile Organic Compounds by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2-Dibromoethane [106-93-4]^	0.004	U	ug/L	1	0.004	0.020	7J26015	EPA 8011	10/26/17 18:04	RGG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
1,1,1,2-Tetrachloroethane	*0.27*	*1*	*0.250*	*109 %*	*70-130*	*7J26015*	*EPA 8011*	*10/26/17 18:04*	*RGG*	

ANALYTICAL RESULTS

Description: SB-1 **Lab Sample ID:** AA07479-01 **Received:** 10/25/17 08:00

Matrix: Ground Water **Sampled:** 10/24/17 13:08 **Work Order:** AA07479

Project: Manatee County - Orlando Avenue **Sampled By:** Anthony Hall

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	100	U	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 04:58	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*390*	*1*	*400*	*97 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 04:58*	*JJB*	
o-Terphenyl	*230*	*1*	*201*	*114 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 04:58*	*JJB*	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Lead [7439-92-1]^	3.80	U	ug/L	1	3.80	10.0	7J27002	EPA 6010C	10/30/17 11:21	ACV	

ANALYTICAL RESULTS

Description: SB-2 **Lab Sample ID:** AA07479-02 **Received:** 10/25/17 08:00

Matrix: Ground Water **Sampled:** 10/24/17 12:07 **Work Order:** AA07479

Project: Manatee County - Orlando Avenue **Sampled By:** Anthony Hall

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 01:01	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 01:01	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 01:01	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 01:01	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 01:01	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 01:01	KKW	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 01:01	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*102 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 01:01*	*KKW*	
Dibromofluoromethane	*49*	*1*	*50.0*	*97 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 01:01*	*KKW*	
Toluene-d8	*53*	*1*	*50.0*	*107 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 01:01*	*KKW*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.047	U	ug/L	1	0.047	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
2-Methylnaphthalene [91-57-6]^	0.044	U	ug/L	1	0.044	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Acenaphthene [83-32-9]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Acenaphthylene [208-96-8]^	0.036	U	ug/L	1	0.036	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Anthracene [120-12-7]^	0.036	U	ug/L	1	0.036	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Benzo(a)anthracene [56-55-3]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Benzo(a)pyrene [50-32-8]^	0.043	U	ug/L	1	0.043	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.059	U	ug/L	1	0.059	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.040	U	ug/L	1	0.040	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.046	U	ug/L	1	0.046	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Chrysene [218-01-9]^	0.051	U	ug/L	1	0.051	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.026	U	ug/L	1	0.026	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Fluoranthene [206-44-0]^	0.051	U	ug/L	1	0.051	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Fluorene [86-73-7]^	0.038	U	ug/L	1	0.038	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Naphthalene [91-20-3]^	0.035	U	ug/L	1	0.035	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Phenanthrene [85-01-8]^	0.039	U	ug/L	1	0.039	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	
Pyrene [129-00-0]^	0.048	U	ug/L	1	0.048	0.10	7J28001	EPA 8270D	10/31/17 09:14	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*4.9*	*1*	*5.71*	*86 %*	*61-151*	*7J28001*	*EPA 8270D*	*10/31/17 09:14*	*jfi*	

Semivolatile Organic Compounds by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2-Dibromoethane [106-93-4]^	0.004	U	ug/L	1	0.004	0.020	7J26015	EPA 8011	10/26/17 18:20	RGG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
1,1,1,2-Tetrachloroethane	*0.27*	*1*	*0.250*	*107 %*	*70-130*	*7J26015*	*EPA 8011*	*10/26/17 18:20*	*RGG*	

ANALYTICAL RESULTS

Description: SB-2 **Lab Sample ID:** AA07479-02 **Received:** 10/25/17 08:00

Matrix: Ground Water **Sampled:** 10/24/17 12:07 **Work Order:** AA07479

Project: Manatee County - Orlando Avenue **Sampled By:** Anthony Hall

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	100	U	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 05:31	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*370*	*1*	*400*	*92 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 05:31*	*JJB*	
o-Terphenyl	*210*	*1*	*201*	*106 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 05:31*	*JJB*	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Lead [7439-92-1]^	3.80	U	ug/L	1	3.80	10.0	7J27002	EPA 6010C	10/30/17 11:23	ACV	

ANALYTICAL RESULTS

Description: SB-3 **Lab Sample ID:** AA07479-03 **Received:** 10/25/17 08:00

Matrix: Ground Water **Sampled:** 10/24/17 11:08 **Work Order:** AA07479

Project: Manatee County - Orlando Avenue **Sampled By:** Anthony Hall

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7K01025	EPA 8260B	11/02/17 01:30	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7K01025	EPA 8260B	11/02/17 01:30	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 01:30	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7K01025	EPA 8260B	11/02/17 01:30	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7K01025	EPA 8260B	11/02/17 01:30	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7K01025	EPA 8260B	11/02/17 01:30	KKW	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7K01025	EPA 8260B	11/02/17 01:30	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*101 %*	*41-142*	*7K01025*	*EPA 8260B*	*11/02/17 01:30*	*KKW*	
Dibromofluoromethane	*49*	*1*	*50.0*	*97 %*	*53-146*	*7K01025*	*EPA 8260B*	*11/02/17 01:30*	*KKW*	
Toluene-d8	*53*	*1*	*50.0*	*105 %*	*41-146*	*7K01025*	*EPA 8260B*	*11/02/17 01:30*	*KKW*	

Semivolatile Organic Compounds by GCMS SIM

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1-Methylnaphthalene [90-12-0]^	0.047	U	ug/L	1	0.047	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
2-Methylnaphthalene [91-57-6]^	0.044	U	ug/L	1	0.044	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Acenaphthene [83-32-9]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Acenaphthylene [208-96-8]^	0.036	U	ug/L	1	0.036	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Anthracene [120-12-7]^	0.036	U	ug/L	1	0.036	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Benzo(a)anthracene [56-55-3]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Benzo(a)pyrene [50-32-8]^	0.043	U	ug/L	1	0.043	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Benzo(b)fluoranthene [205-99-2]^	0.059	U	ug/L	1	0.059	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Benzo(g,h,i)perylene [191-24-2]^	0.040	U	ug/L	1	0.040	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Benzo(k)fluoranthene [207-08-9]^	0.046	U	ug/L	1	0.046	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Chrysene [218-01-9]^	0.051	U	ug/L	1	0.051	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Dibenzo(a,h)anthracene [53-70-3]^	0.026	U	ug/L	1	0.026	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Fluoranthene [206-44-0]^	0.051	U	ug/L	1	0.051	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Fluorene [86-73-7]^	0.038	U	ug/L	1	0.038	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Indeno(1,2,3-cd)pyrene [193-39-5]^	0.037	U	ug/L	1	0.037	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Naphthalene [91-20-3]^	0.035	U	ug/L	1	0.035	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Phenanthrene [85-01-8]^	0.039	U	ug/L	1	0.039	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	
Pyrene [129-00-0]^	0.048	U	ug/L	1	0.048	0.10	7J28001	EPA 8270D	10/31/17 09:36	jfi	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
p-Terphenyl	*4.2*	*1*	*5.71*	*74 %*	*61-151*	*7J28001*	*EPA 8270D*	*10/31/17 09:36*	*jfi*	

Semivolatile Organic Compounds by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2-Dibromoethane [106-93-4]^	0.004	U	ug/L	1	0.004	0.020	7J26015	EPA 8011	10/26/17 18:36	RGG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
1,1,1,2-Tetrachloroethane	*0.28*	*1*	*0.250*	*111 %*	*70-130*	*7J26015*	*EPA 8011*	*10/26/17 18:36*	*RGG*	

ANALYTICAL RESULTS

Description: SB-3 **Lab Sample ID:** AA07479-03 **Received:** 10/25/17 08:00
Matrix: Ground Water **Sampled:** 10/24/17 11:08 **Work Order:** AA07479
Project: Manatee County - Orlando Avenue **Sampled By:** Anthony Hall

FL Petroleum Range Organics

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
TPH (C8-C40)^	100	U	ug/L	1	100	680	7J30053	FL-PRO	11/01/17 06:05	JJB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
n-Nonatriacontane	*350*	*1*	*392*	*88 %*	*42-193*	*7J30053*	*FL-PRO*	*11/01/17 06:05*	*JJB*	
o-Terphenyl	*190*	*1*	*197*	*96 %*	*82-142*	*7J30053*	*FL-PRO*	*11/01/17 06:05*	*JJB*	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Jacksonville certified analyte [NELAC E82277]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Lead [7439-92-1]^	**4.53**	I	ug/L	1	3.80	10.0	7J27002	EPA 6010C	10/30/17 11:24	ACV	

Description: TRIP BLANK **Lab Sample ID:** AA07479-04 **Received:** 10/25/17 08:00
Matrix: Water **Sampled:** 10/24/17 00:00 **Work Order:** AA07479
Project: Manatee County - Orlando Avenue **Sampled By:** ENCO

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	1.0	7J31014	EPA 8260B	10/31/17 15:20	NLM	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	1.0	7J31014	EPA 8260B	10/31/17 15:20	NLM	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 15:20	NLM	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	1.0	7J31014	EPA 8260B	10/31/17 15:20	NLM	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	1.0	7J31014	EPA 8260B	10/31/17 15:20	NLM	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	1.0	7J31014	EPA 8260B	10/31/17 15:20	NLM	
Xylenes (Total) [1330-20-7]^	1.3	U	ug/L	1	1.3	2.0	7J31014	EPA 8260B	10/31/17 15:20	NLM	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*47*	*1*	*50.0*	*93 %*	*41-142*	*7J31014*	*EPA 8260B*	*10/31/17 15:20*	*NLM*	
Dibromofluoromethane	*50*	*1*	*50.0*	*100 %*	*53-146*	*7J31014*	*EPA 8260B*	*10/31/17 15:20*	*NLM*	
Toluene-d8	*54*	*1*	*50.0*	*109 %*	*41-146*	*7J31014*	*EPA 8260B*	*10/31/17 15:20*	*NLM*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7J31014 - EPA 5030B_MS

Blank (7J31014-BLK1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 13:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.71	U	1.0	ug/L							
Ethylbenzene	0.69	U	1.0	ug/L							
m,p-Xylenes	1.3	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.60	U	1.0	ug/L							
o-Xylene	0.53	U	1.0	ug/L							
Toluene	0.72	U	1.0	ug/L							
Xylenes (Total)	1.3	U	2.0	ug/L							
4-Bromofluorobenzene	*48*			*ug/L*	*50.0*		*96*	*41-142*			
Dibromofluoromethane	*49*			*ug/L*	*50.0*		*98*	*53-146*			
Toluene-d8	*51*			*ug/L*	*50.0*		*101*	*41-146*			

LCS (7J31014-BS1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 10:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	15		1.0	ug/L	20.0		76	56-136			
Toluene	17		1.0	ug/L	20.0		83	64-131			
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*105*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

Matrix Spike (7J31014-MS1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 11:22

Source: AA06392-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	23		1.0	ug/L	20.0	4.6	91	56-136			
Toluene	24		1.0	ug/L	20.0	3.1	106	64-131			
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*103*	*41-142*			
Dibromofluoromethane	*49*			*ug/L*	*50.0*		*98*	*53-146*			
Toluene-d8	*50*			*ug/L*	*50.0*		*100*	*41-146*			

Matrix Spike Dup (7J31014-MSD1) Prepared: 10/31/2017 00:00 Analyzed: 10/31/2017 11:51

Source: AA06392-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	24		1.0	ug/L	20.0	4.6	100	56-136	7	14	
Toluene	25		1.0	ug/L	20.0	3.1	111	64-131	4	16	
4-Bromofluorobenzene	*54*			*ug/L*	*50.0*		*109*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*54*			*ug/L*	*50.0*		*107*	*41-146*			

Batch 7K01025 - EPA 5030B_MS

Blank (7K01025-BLK1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 22:08

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	0.71	U	1.0	ug/L							
Ethylbenzene	0.69	U	1.0	ug/L							
m,p-Xylenes	1.3	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.60	U	1.0	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 7K01025 - EPA 5030B_MS - Continued

Blank (7K01025-BLK1) Continued Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 22:08

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	0.53	U	1.0	ug/L							
Toluene	0.72	U	1.0	ug/L							
Xylenes (Total)	1.3	U	2.0	ug/L							
4-Bromofluorobenzene	*51*			*ug/L*	*50.0*		*103*	*41-142*			
Dibromofluoromethane	*48*			*ug/L*	*50.0*		*97*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

LCS (7K01025-BS1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 19:44

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	22		1.0	ug/L	20.0		110	56-136			
Toluene	23		1.0	ug/L	20.0		117	64-131			
4-Bromofluorobenzene	*50*			*ug/L*	*50.0*		*100*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*101*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

Matrix Spike (7K01025-MS1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 20:13

Source: AA06791-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	90		1.0	ug/L	20.0	74	81	56-136			
Toluene	120	L	1.0	ug/L	20.0	100	82	64-131			
4-Bromofluorobenzene	*51*			*ug/L*	*50.0*		*102*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

Matrix Spike Dup (7K01025-MSD1) Prepared: 11/01/2017 13:59 Analyzed: 11/01/2017 20:42

Source: AA06791-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzene	84		1.0	ug/L	20.0	74	49	56-136	7	14	QM-17
Toluene	110	L	1.0	ug/L	20.0	100	41	64-131	7	16	QM-17
4-Bromofluorobenzene	*51*			*ug/L*	*50.0*		*101*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J28001 - EPA 3511_MS

Blank (7J28001-BLK1) Prepared: 10/28/2017 06:11 Analyzed: 10/30/2017 19:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1-Methylnaphthalene	0.047	U	0.10	ug/L							
2-Methylnaphthalene	0.044	U	0.10	ug/L							
Acenaphthene	0.037	U	0.10	ug/L							
Acenaphthylene	0.036	U	0.10	ug/L							
Anthracene	0.036	U	0.10	ug/L							
Benzo(a)anthracene	0.037	U	0.10	ug/L							

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GCMS SIM - Quality Control

Batch 7J28001 - EPA 3511_MS - Continued

Blank (7J28001-BLK1) Continued Prepared: 10/28/2017 06:11 Analyzed: 10/30/2017 19:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(a)pyrene	0.043	U	0.10	ug/L							
Benzo(b)fluoranthene	0.059	U	0.10	ug/L							
Benzo(g,h,i)perylene	0.040	U	0.10	ug/L							
Benzo(k)fluoranthene	0.046	U	0.10	ug/L							
Chrysene	0.051	U	0.10	ug/L							
Dibenzo(a,h)anthracene	0.026	U	0.10	ug/L							
Fluoranthene	0.051	U	0.10	ug/L							
Fluorene	0.038	U	0.10	ug/L							
Indeno(1,2,3-cd)pyrene	0.037	U	0.10	ug/L							
Naphthalene	0.035	U	0.10	ug/L							
Phenanthrene	0.039	U	0.10	ug/L							
Pyrene	0.048	U	0.10	ug/L							
p-Terphenyl	*6.6*			*ug/L*	*5.71*		*116*	*61-151*			

LCS (7J28001-BS1) Prepared: 10/28/2017 06:11 Analyzed: 10/30/2017 20:15

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	5.7		0.10	ug/L	5.71		99	80-120			
Benzo(a)pyrene	5.9		0.10	ug/L	5.71		104	73-149			
Benzo(g,h,i)perylene	5.8		0.10	ug/L	5.71		101	57-124			
Naphthalene	5.0		0.10	ug/L	5.71		88	68-120			
p-Terphenyl	*6.4*			*ug/L*	*5.71*		*112*	*61-151*			

Matrix Spike (7J28001-MS1) Prepared: 10/28/2017 06:11 Analyzed: 10/30/2017 20:37

Source: AA07548-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	5.9		0.10	ug/L	5.71	0.037 U	102	80-120			
Benzo(a)pyrene	6.1		0.10	ug/L	5.71	0.043 U	107	73-149			
Benzo(g,h,i)perylene	6.1		0.10	ug/L	5.71	0.040 U	106	57-124			
Naphthalene	5.1		0.10	ug/L	5.71	0.035 U	89	68-120			
p-Terphenyl	*6.5*			*ug/L*	*5.71*		*113*	*61-151*			

Matrix Spike Dup (7J28001-MSD1) Prepared: 10/28/2017 06:11 Analyzed: 10/30/2017 20:58

Source: AA07548-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acenaphthene	6.1		0.10	ug/L	5.71	0.037 U	108	80-120	5	25	
Benzo(a)pyrene	6.5		0.10	ug/L	5.71	0.043 U	113	73-149	5	25	
Benzo(g,h,i)perylene	6.2		0.10	ug/L	5.71	0.040 U	108	57-124	2	25	
Naphthalene	5.4		0.10	ug/L	5.71	0.035 U	94	68-120	6	25	
p-Terphenyl	*6.8*			*ug/L*	*5.71*		*118*	*61-151*			

Semivolatile Organic Compounds by GC - Quality Control

Batch 7J26015 - EPA 504/8011

QUALITY CONTROL DATA

Semivolatile Organic Compounds by GC - Quality Control

Batch 7J26015 - EPA 504/8011 - Continued

Blank (7J26015-BLK1) Prepared: 10/26/2017 10:00 Analyzed: 10/26/2017 14:34

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.004	U	0.020	ug/L							
1,1,1,2-Tetrachloroethane	*0.28*			*ug/L*	*0.250*		*111*	*70-130*			

LCS (7J26015-BS1) Prepared: 10/26/2017 10:00 Analyzed: 10/26/2017 14:50

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.26		0.020	ug/L	0.250		104	65-133			
1,1,1,2-Tetrachloroethane	*0.28*			*ug/L*	*0.250*		*113*	*70-130*			

Matrix Spike (7J26015-MS1) Prepared: 10/26/2017 10:00 Analyzed: 10/26/2017 15:06

Source: AA07548-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.26		0.020	ug/L	0.250	0.004 U	102	65-133			
1,1,1,2-Tetrachloroethane	*0.28*			*ug/L*	*0.250*		*112*	*70-130*			

Matrix Spike Dup (7J26015-MSD1) Prepared: 10/26/2017 10:00 Analyzed: 10/26/2017 15:23

Source: AA07548-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromoethane	0.26		0.020	ug/L	0.250	0.004 U	104	65-133	2	17	
1,1,1,2-Tetrachloroethane	*0.28*			*ug/L*	*0.250*		*113*	*70-130*			

FL Petroleum Range Organics - Quality Control

Batch 7J30053 - EPA 3510C

Blank (7J30053-BLK1) Prepared: 10/30/2017 17:19 Analyzed: 10/31/2017 23:53

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	100	U	680	ug/L							
n-Nonatriacontane	*440*			*ug/L*	*400*		*109*	*42-193*			
o-Terphenyl	*240*			*ug/L*	*201*		*119*	*82-142*			

LCS (7J30053-BS1) Prepared: 10/30/2017 17:19 Analyzed: 11/01/2017 00:27

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	7000		680	ug/L	6800		103	55-118			
n-Nonatriacontane	*380*			*ug/L*	*400*		*94*	*42-193*			
o-Terphenyl	*230*			*ug/L*	*201*		*113*	*82-142*			

Matrix Spike (7J30053-MS1) Prepared: 10/30/2017 17:19 Analyzed: 11/01/2017 01:00

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	7400		680	ug/L	6800	100 U	109	41-101			QM-07
n-Nonatriacontane	*420*			*ug/L*	*400*		*106*	*42-193*			
o-Terphenyl	*240*			*ug/L*	*201*		*120*	*82-142*			

QUALITY CONTROL DATA

FL Petroleum Range Organics - Quality Control

Batch 7J30053 - EPA 3510C - Continued

Matrix Spike Dup (7J30053-MSD1) Prepared: 10/30/2017 17:19 Analyzed: 11/01/2017 01:34

Source: AA07711-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
TPH (C8-C40)	6900		680	ug/L	6800	100 U	102	41-101	7	20	QM-07
n-Nonatriacontane	*310*			*ug/L*	*400*		*78*	*42-193*			
o-Terphenyl	*230*			*ug/L*	*201*		*116*	*82-142*			

Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control

Batch 7J27002 - EPA 3005A

Blank (7J27002-BLK1) Prepared: 10/27/2017 10:29 Analyzed: 10/30/2017 10:43

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	38.0	U	100	ug/L							

LCS (7J27002-BS1) Prepared: 10/27/2017 10:29 Analyzed: 10/30/2017 10:45

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	4980		100	ug/L	5000		100	80-120			

Matrix Spike (7J27002-MS1) Prepared: 10/27/2017 10:29 Analyzed: 10/30/2017 10:47

Source: AA07479-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	5080		100	ug/L	5000	38.0 U	102	75-125			

Matrix Spike Dup (7J27002-MSD1) Prepared: 10/27/2017 10:29 Analyzed: 10/30/2017 10:48

Source: AA07479-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Lead	4960		100	ug/L	5000	38.0 U	99	75-125	2	20	

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*	Not reported due to interference.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-17	Matrix spike recovery was outside acceptance limits due to high concentrations of analyte in source sample.

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
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102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

www.encolabs.com

Client Name: PSI - Tampa (PS003)	Project Number: 05522422
Address: 5801 Benjamin Center Drive Suite 112	Project Name/Desc: Manatee County - Orlando Avenue
City/ST/Zip: Tampa, FL 33634	PO # / Billing Info:
Tel: (813) 886-1075 Fax: (813) 888-6514	Reporting Contact: Sean Barnes
Sampler(s) Name, Affiliation (Print): Anthony Hall PSI	Billing Contact: Accounts Payable
Sampler(s) Signature:	Site Location / Time Zone:

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

✓ Standard

___ Expedited

Due ___/___/___

Lab Workorder: AA07479

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	8011 EDB (Water)	8260B EDB (Soil)	8260B Arom	8270D PAH SIM	FLPRO	Pb					Sample Comments
	SB-1	10-24-17	1308	Grab	GW	9	X		X	X	X	X					
	SB-2	10-24-17	1207	Grab	GW	9	X		X	X	X	X					
	SB-3	10-24-17	1108	Grab	GW	9	X		X	X	X	X					

Requested Analyses

Preservation (See Codes) (Combine as necessary)

<-- Total # of Containers

Sample Kit Prepared By: ECG	Date/Time: 10/19/17 12:20	Relinquished By:	Date/Time: 10/19/17 12:20	Received By:	Date/Time: 10-24-17 0700
Comments/Special Reporting Requirements:		Relinquished By:	Date/Time: 10-24-17 1445	Received By:	Date/Time: 10/24/17 1445
		Relinquished By:	Date/Time: 10/24/17 1930	Received By:	Date/Time: 10-25-17 0800
		Cooler #'s & Temps on Receipt: C-23 1.8°C		Condition Upon Receipt: ___ Acceptable ___ Unacceptable	

Matrix : **GW**-Groundwater **SO**-Soil **DW**-Drinking Water **SE**-Sediment **SW**-Surface Water **WW**-Wastewater **A**-Air **O**-Other (detail in comments)

Preservation: **I**-Ice **H**-HCl **N**-HNO3 **S**-H2SO4 **NO**-NaOH **O**-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

ATTACHMENT D
PHOTOGRAPH LOG OF FIELD WORK

Photo 1: A view of the advancement of SB-3.

Photo 2: A view of soil screening of SB-3.