PRP STANDARD SPECIFICATION DETAILS

This document is intended for the use of both FDEP Site Managers and Agency Term Contractors performing work under contract with the Petroleum Restoration Program (PRP). It describes the general requirements and expectations for the various activities identified in the Scope of Work assigned under purchase orders. All work must be performed in accordance with the Purchase Order - Scope of Work, Chapters 62-160, 62-532, 62-777 and 62-780, F.A.C., all applicable FDEP and Water Management District guidance memoranda, standard industry procedures and as described in the Agency Term Contract (ATC).

Copies of all referenced guidelines are available at:
http://www.floridadep.gov/waste/petroleum-restoration

Reports must be submitted using the appropriate FDEP forms found at:
http://www.floridadep.gov/waste/petroleum-restoration/content/procedures-guidance-documents

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1 GENERAL REQUIREMENTS

The Contractor shall comply with all requirements within this section and understand that they apply to all tasks and subtasks in this SOW. Communication between the Contractor and the FDEP/LP Site Manager is crucial to the successful outcome for the Property Owner/RP, Contractor and State of Florida. Contractor shall provide and install all materials required to complete the SOW. This shall include all labor and equipment required to perform the tasks in this SOW.

1.1 Automated Data Processing Tool (ADaPT)

The PRP requires the submittal of ADaPT EDD for all laboratory and field data. Please refer to the PRP's section of the ADaPT webpage for the latest guidance at: https://floridadep.gov/waste/waste/content/adapt. The lab, field and error EDD files must be zipped and placed at: ftp://ftp.dep.state.fl.us/pub/incoming/OCULUS/PR_ADaPT/.

1.2 Cooperation with Inspectors

The Contractor shall cooperate with FDEP/LP Inspectors and Site Managers and respond within seven (7) days of the request to coordinate site visits for inspections, provide keys or lock combinations to remedial system compounds or buildings, review maintenance and warranty records or demonstrate equipment operation and maintenance.

1.3 Investigative Derived Waste (IDW)

The Contractor shall be responsible for the proper storage, manifesting and "cradle to grave" tracking of contaminated or potentially contaminated waste of any kind which are directly or indirectly generated from the Contractor's performance under the PO. An exception to Paragraph 43 of the ATC, and only when directed to do so by the FDEP/LP, the Contractor shall act as the direct representative for the FDEP/LP in the signing of manifests for contaminated waste management. However, pursuant to Sections 403.021(1)-(5) and 376.305(1), (3) and (4), Florida Statutes, the signing of such documents is not an admission of liability for the contamination. Where appropriate, the Contractor shall employ the services of licensed or certified subcontractors for the transportation, treatment, storage, or disposal of said hazardous materials or substances.

1.4 Laboratory Analysis

Soil, sediment, water, air, product, and/or "other" analysis required by this SOW must be performed in accordance with requirements set forth in Attachment A of the ATC.

Additionally, IDW or Pre-burn testing may include any of the following: BTEX/MTBE, PAHs, TRPH, RCRA Metals, and TCLP for Lead. NAM Parameters include: Nitrate, Dissolved Iron by EPA 200.7, 200.9, 6010B or 7380, Orthophosphate, Sulfate, and Methane by EPA RSK-SOP 175. EDB in water can be analyzed by EPA 8260SIM if the minimum detection level is equal to or lower than the CTL of 0.02 µg/L.

1.5 Maintenance-Of-Traffic (MOT) and Traffic Control

A MOT Plan will be required for activities conducted within the FDOT ROW or whenever lane closures or other obstructions to traffic flow occur. The Contractor is responsible for filing a MOT Plan. All work conducted by the Contractor must be conducted in a manner to minimize disruption to the facility's normal operating business. The Contractor is responsible for providing safe access for customers, owners and others at any time to all facilities at the project site and adjacent affected properties.

1.6 Notice of Field Activities

The Contractor shall contact in writing the Site Manager and all applicable persons (the site operator, site owner, RP and affected off-site property owners), a minimum of seven (7) calendars days prior to the proposed field activities, to ensure that field work is coordinated. If the site is managed by FDEP (Teams 1-4) or Teams 5 or 6, the notification must also include the PRP Inspector (PRP_Inspector@dep.state.fl.us). The exact day(s) of the proposed field work need(s) to be specified in the notification. Emails are acceptable.

1.7 Off-Site Access Permission

The Contractor is responsible for obtaining and/or confirming any access permissions necessary to complete assessment/remediation/monitoring/restoration activities. These agreements include any applicable private property access agreements. The Contractor is responsible for discussing the SOW with all affected property owners and providing documentation of any specific needs and/or requirements brought forth in this discussion.

The agreement shall specify what work will be allowed and the duration of the agreement. The permission must be secured in writing and a copy of the agreement must be submitted to the DEP with the field notification for the relevant field event. A sample property access agreement is included at https://floridadep.gov/waste/petroleum-restoration/content/administrative-guidance Additionally, a copy of the agreement must be included in the deliverable.

1.8 Permitting

If required to complete the activities in this SOW, Contractor shall acquire well installation, abandonment, and right of way permit(s). A copy of all permits shall be included in the Interim Deliverable for the appropriate task and in the final report

An estimated Not-to-Exceed cost has been included in Attachment B – Schedule of Pay Items to address permit fees. If the actual cost of permit fees will exceed the estimated cost provided, a Request for Change shall be submitted showing the actual cost and a MFMP PO Change Order shall be issued. Only documented costs will be reimbursed. A review of the permitting requirements shall be completed and the DEP notified of such requirements within sixty (60) calendar days of issuance of the MFMP PO to the Contractor. All permits shall be submitted to the DEP Site Manager as an attachment in the final submitted report.

1.9 Warranty

The work shall, at a minimum, include a one (1) year warranty from the date of acceptance of work for all workmanship and equipment provided and installed by the Contractor and shall survive the term of the MFMP PO, whichever is longer. The Contractor is responsible for replacing and correcting any defective equipment or failures due to poor workmanship during the warranty

period. The Contractor shall provide a plan of intended repairs or replacements within fourteen (14) days of notification of warranty claim by the FDEP/LP. Any refusal or failure by the Contractor to replace or correct deficiencies may result in the suspension of all other work assigned under the ATC.

1.10 Waste Manifests

All waste manifests shall be signed by the Contractor as the direct representative working on behalf of the FDEP/LP.

1.11 Well Locate

A metal detector or shovel may be needed to locate wells. The Contractor must contact the FDEP/LP Site Manager immediately from the field if tasked well(s) cannot be located.

1.12 Utilities Cost

Costs associated with utility establishment, removal and monthly cost will be paid by the FDEP/LP outside of the costs associated with the PO.

2 OFFICE ACTIVITIES

2.1 Site Access Agreement

Prior to initiating any work under this SOW, the Contractor must have in its possession a copy of a fully executed Site Access agreement between the FDEP and the Property Owner or a fully executed Site Access agreement between the Contractor and the Property Owner. Accepted agreements have been uploaded to and can be found in OCULUS. The Contractor is responsible for reading and complying with the terms of the access agreement- not all agreements are exactly the same. The Property Owner/RP has the right to reject one Contractor selected by the initial RCI-process. Prior to any work being conducted, the Contractor shall contact the Property Owner/RP, to communicate and coordinate site activities. No payment will be made for any work conducted prior to obtaining a copy of the necessary access agreements for affected properties.

2.2 File Review

The Contractor shall perform a file review of all applicable FDEP records for the site. At a minimum, the information reported must include: historical free product and DTW Table(s), the DTW range, the screen intervals of MWs, and lithology in the affected depth interval. Additionally, this file review shall be used to describe the site history as it relates to the activities described in this SOW. The deliverable is a completed Historical Summary Worksheet that can be found at: https://floridadep.gov/waste/petroleum-restoration/forms/historical-site-summary.

2.3 Health and Safety Plan

The Contractor is required to perform all activities within this SOW under a prepared site-specific HASP, as required by state and federal regulations. The HASP must be updated and maintained at no cost to the FDEP/LP. All safety requirements must conform to the OSHA Guidelines for Hazardous Waste Operations, 29 CFR Part 1910. The HASP will be designed to protect the health and safety of local residents, as well as, ATC personnel and any subcontractors performing work at the site. A site-specific and comprehensive standard petroleum site HASP and all applicable field sign-up sheets must be available onsite for all field activities. Guidelines and examples for the HASP can be found at: https://floridadep.gov/waste/petroleum-restoration/content/health-safety-guidance.

A) All Contractor onsite personnel shall be OSHA 40-hour HAZWOPER certified.

B) The Contractor shall abide by OSHA rules as listed in 29 CFR 1910, 29 CFR 1926, and OSHA General Duty Clause – Section 5, where applicable.

The deliverable is the submission of the HASP, executed Off-Site Access agreement(s) and Historical Summary Worksheet.

2.4 Initial Noticing Package

If tasked in the Scope of Work, the Contractor must prepare an information package detailing the extent of the contamination plumes and must include the following: completed Initial Notice of Contamination Beyond Property Boundaries, Contamination Notification Data Table(s), and copies of the most recent contaminant soil and/or groundwater plume maps.

3 ASSESSMENT ACTIVITIES

3.1 Soil Boring Installation

The Contractor shall conduct soil sampling and analyses, including the installation of SBs in the areas agreed upon with the FDEP/LP Site Manager to more fully identify the extent of contaminated soil at the site. The Contractor, at a minimum, must perform the following:

A. Advance SBs to the depths noted in the SOW Soil Boring and Monitoring Well Installation Table;
B. Collect and document lithological descriptions and moisture content continuously to the total depth of each borehole;
C. Screen soils using an OVA-PID or OVA-FID at the depth intervals noted in the SOW Soil Boring and Monitoring Well Installation Table.

3.2 Soil Sampling

The Contractor shall obtain and record soil samples at the intervals and locations per discussions with the FDEP/LP Site Manager. The soil samples will be analyzed for the analytical parameters agreed upon or per the SOW Soil and Air Sampling Table. Soil sampling and analyses must allow for the collection of additional aliquot for SPLP extraction and/or for Fractionation. The laboratory must be instructed on the COC to hold the analysis of these samples until approved by the FDEP/LP Site Manager. The Contractor must submit the soil samples to a NELAP certified laboratory for analysis.

3.3 Monitoring Well Installation

The Contractor shall install MWs in the locations agreed upon with the FDEP/LP Site Manager to more fully identify the extent of contaminated groundwater at the site.

A. Install MWs to the depths noted in the SOW Soil Boring and Monitoring Well Installation Table;
B. Collect and document lithological descriptions and moisture content continuously to the total depth of the borehole;
C. Screen soils using an OVA-PID or OVA-FID at the depth intervals noted in the SOW Soil Boring and Monitoring Well Installation Table.

3.4 Groundwater Sampling

The Contractor will allow newly installed wells to equilibrate and sample not less than twenty-four (24) hours after installation. The groundwater samples will be analyzed for the analytical parameters specified in the SOW Water Sampling Table. The Contractor shall submit the groundwater samples to a NELAP certified laboratory analysis. If sampling is for Baseline Sampling,

the Contractor shall conduct this event within thirty (30) days prior to system startup. At a minimum, the following shall be performed, recorded and reported:

A. Gauge DTW and collect samples for the analytical parameters specified in the SOW Water Sampling Table. Do not sample wells with FP or submerged screens;
B. Collect stabilization field measurements of conductivity, D.O., pH, temperature, and turbidity. NAM Parameters (including ORP), if collected, must be taken from at least three (3) wells; source, upgradient from and downgradient from source;
C. For newly installed wells, collect TOC elevations;
D. Inspect all lay-in, bolt down, or locking well vaults to be monitored and status of well caps. Repair or replace any non-functioning expendable well caps;
E. Verify the integrity of every well specified in the SOW Water Sampling Table, prior to sampling. Standing water must be removed before opening well caps;
F. Contractor shall dispose of FP and PCW generated in accordance with PCS-006 found at: https://floridadep.gov/waste/petroleum-restoration/documents/sop-pcs-006-design-installation-and-placement-monitoring-wells.

3.5 Local Area and/or Professional Land Survey

A public/potable well search and local area survey are required to be completed by the Contractor if the CTLs are found to be exceeded for the site assessment activities performed, if not previously conducted.

If authorized in the SOW, a PLS will be performed. After a PLS has been conducted, all subsequent site maps will be prepared using the survey map as the base site map illustrating the site assessment results.

3.6 Site Assessment Deliverable

The deliverable is the submission of the report as specified in the Scope of Work (Interim SA, SSA, RA Interim, Baseline and TSAR report(s)). If submitting a TSAR, each section will be filled out in its entirety. Each report shall contain the results of the field activities performed, and shall include at a minimum:

A. Copies of any permits obtained and not previously submitted;
B. A summary of work performed, sampling results, conclusions based on data collected and recommendations for modifications of subsequent tasks, including, as applicable: a description of any changes in land use, efforts made to locate missing wells, description of methods used to identify IDW and disposal, and any other relevant information related to the field activities and resultant data;
C. For TSAR only, summary of work shall also include: estimated costs with breakdown to achieve closure by RMO 1 and RMO 2;
D. If applicable, a recommendation and justification for No Further Action, well abandonment and site restoration;
E. A site map depicting the locations of all SBs, compliance wells and MWs in relation to former and current tank areas, integral piping and dispensers, buildings, land cover, sidewalks, utilities, and any public or private supply wells present onsite. Property lines and any former excavated areas must be indicated;
F. Additional figures (with scale and legend) shall be provided depicting, as it applies to the assessment: off-site potable wells and potential receptors, a plume map showing the lateral and vertical extent of all contaminants of concern exceeding soil and/or groundwater CTLs and/or NADCs, groundwater elevation map with elevations calculated for each MWs, piezometer and compliance well, contamination map illustrating the degree

of soil and/or groundwater contamination at each boring and well location with sampling dates and analytical data, OVA map depicting highest OVA reading for each boring location;

G. For TSAR only, figures (with scale and legend) showing site location illustrated on an USGS topographic map including quadrangle name and scale, can be combined with a well survey map with ½ mile and ¼ mile circles drawn around site, vicinity map depicting adjacent property usage within a one or two block radius of source property, lithological cross-section at site where lithological information has been collected with screened intervals and water levels;
H. Tabulated soil and groundwater data, including historical and current status of wells must be reflected in all groundwater tables;
I. SB, MW, groundwater and instrument calibration logs, as it applies to this SOW;
J. Laboratory report(s), COC(s) and NELAP certification for the field work conducted;
K. Disposal manifests, weight tickets and/or certificates of treatment or disposal, as they apply to this SOW;
L. Copy of all field notes.
M. Any other items specified in the Scope of Work/Purchase Order for the site-specific report (e.g. photographic documentation, ADaPT data, etc.).

4 REMEDIAL ACTION ACTIVITIES

4.1 Pre--RAP Teleconference

The pre-RAP teleconference is considered part of the overall RAP preparation and submittal but may not always be required. The Contractor shall be responsible for coordinating the teleconference with the FDEP/LP and all interested stakeholders.

A. For Source Removal, the Contractor will compile and submit a Site Summary Package prior to the teleconference and must include the following section and discussions:
    a. Comprehensive assessment and cleanup data, conceptual remedial approaches and cost cleanup options and preliminary remedial design sketches;
    b. Contour of the area that will be included within the excavation;
    c. Depth of the excavation;
    d. Need for shoring or dewatering;
    e. OVA threshold or footprint;
    f. Need for and description of any treatment (e.g., ORC, chemical) within the excavation pit;
    g. Location and number of confirmatory soil samples.
B. For System Remediation, the Contractor will compile and submit a Site Summary Package prior to the teleconference and must include the following sections and discussions:
    a. Comprehensive assessment and cleanup data, conceptual remedial approaches and cost cleanup options and preliminary remedial design sketches;
    b. Contour of the area that will be included within the treatment zone, depth of treatment zone and treatment points and number of zones that will be used;
    c. Results of any previous pilot tests and/or active system operations and resultant observed ROI, including a discussion on potential for using varied radii for the source area v. the “outer” areas;
    d. Necessity and justification of additional pilot testing;
    e. Potential locations for the treatment compound.

Following the completion of the pre-RAP teleconference, the Contractor must prepare and submit an email including documentation of the conference conducted and the parties that participated, and a summary of the conclusions and the Conceptual Design Summary.

4.2 Pilot Test Plan

The Contractor must prepare a pilot test plan to evaluate the feasibility of the proposed technology and effectively design the final system. The plan must include, at a minimum: a description of the proposed test, the test and measurement points, measurement protocols and duration of the test. The deliverable is the submission of a PT Plan, as specified in the Deliverables and Project Schedule.

4.3 Pilot Test

The Contractor shall conduct a test of the proposed technology in accordance with the approved Pilot Test Plan. The deliverable is the submission of a Pilot Test report that summarizes and details the testing activities performed and approved in the PT plan and subsequent approved change orders, as specified in the Deliverables and Project Schedule.

4.4 Remedial Action Plan, Limited Scope Remedial Action Plan, or Remedial Action Plan Modification

The Contractor must prepare the plan (RAP/LSRAP/RAPMOD) based on the agreed upon technology as discussed with the FDEP/LP Site Manager. The deliverable is the submission of a RAP, LSRAP, or RAPMOD (as specified in the Scope of Work) and the System Design Checklist. The checklist may be found at: https://floridadep.gov/waste/petroleum-restoration/documents/rap-checklist.

4.5 Temporary Point of Compliance

The Contractor must prepare an information package detailing the extent of the contamination plumes and must include the following: the establishment of a TPOC beyond property boundaries and copies of the most recent contamination soil and/or groundwater plume maps. The deliverable is the submission of the TPOC Noticing Package to the site manager.

4.6 Construction Drawings and Design Specifications

The Contractor must create detailed scaled drawings of the intended remediation system or excavation area that were not already included the RAP/LSRAP/RAPMOD.

A. Design Specifications - The Contractor must provide design specifications based upon the approved RAP/LSRAP/RAPMOD.
    a. For Source Removal, the minimum requirements are as follows:
        i. Provide the areal square footage, depth and volume of soil to be excavated;
        ii. Provide the tonnage of soil to be transported and disposed;
        iii. Provide the areal footage of pavement and/or concrete to be removed and replaced;
        iv. Provide the volume and type of backfill required;
        v. Provide the number and type of compaction testing.
    b. For System Remediation, the minimum requirements are as follows:
        i. Quantity, footage and diameter of treatment points;
        ii. Total footage of trenching;
        iii. System piping and header assemblies (describe type, footage and diameter);

iv. Type and capacity of the off-gas and recovered groundwater treatment trains and disposal;
v. Capacity of all major equipment to include blowers, compressors, pumps, etc. (describe minimum flow, vacuum/pressure, etc.)

B. Construction Drawings - The Contractor must prepare and submit signed and sealed engineering Construction Drawings.
   a. For System Remediation, the Contractor must prepare system design figures and drawings to illustrate the required work. The minimum requirements are as follows:
      i. Cover sheet;
      ii. Proposed construction site map and trench detail layout sections;
      iii. Proposed remedial system compound layout and enclosure anchoring details;
      iv. Remediation well details;
      v. Process and Instrumentation diagram with legend;
      vi. Stub-up, Fence, Electrical Drop and Equipment details.
   b. For Chemical Treatment, the Contractor must prepare system design figures and drawings to illustrate the required work. The minimum requirements are as follows:
      i. Cover sheet;
      ii. Proposed construction site map and detailed layout sections;
      iii. Injection well/point details.

4.7 Remedial Action Construction Scope

The Contractor must prepare and submit a SOW using the appropriate RAC template and RAC Design Table(s) in the Scope of Work Workbook found at: https://floridadep.gov/waste/petroleum-restoration/content/templates-forms-tools-and-guidance.

5 CONSTRUCTION ACTIVITIES

RAC shall include all activities from well installation, trenching, and system installation until all necessary activities have been completed as approved in the RAP/LSRAP/RAPMOD and as noted in the SOW Remedial Action Construction Table. The Contractor shall provide a treatment system that, at a minimum, meets the requirements as detailed in the RAP/LSRAP/RAPMOD and subsequent Construction Drawings and/or Design Specifications.

5.1 General Construction Requirements

The Contractor shall conduct, at a minimum, the following activities:

A. Mobilize and demobilize all equipment;
B. Provide all components necessary to start-up and operate the system described, including motor starters, regulators, gauges, valves, etc. Provide all electrical piping, fittings and appurtenances in accordance with the NEC or NFPA 30, 30A, and 70, Class I, Division II, State of Florida electric codes, and local electric codes. All electric piping and fittings provided must be appropriately sized, intermediate metal conduit or approved equivalent;
C. All work shall conform to the FBC, FEC, NFPA, NEC and IBC requirements, as well as Local, State and Federal codes. Specific standards referenced in this document include but are not limited to: Manual of Uniform Traffic Codes, ASTM D 1784, Specification for Rigid PVC

Compounds and CPVC Compounds, ASTM D 1785, Specification for PVC Pipe, Schedules 40, 80 and 120, ASTM D 2774, Underground Installation of Thermoplastic Pressure Piping;

D. Install all treatment points and underground piping as depicted in the approved drawings;
E. Install the system and connect the required inputs, outputs and power supply and protect and maintain MWs under construction;
F. Utilize FDEP/LP approved backfill and resurface trenched areas to match existing parking lot cover and base design. All sources of imported offsite backfill shall provide laboratory analytical data verifying concentrations of potential contaminants are below respective SCTLs, as defined in Table B of Chapter 62-777, F.A.C., prior to delivery to the site;
G. Replace sod in ROW and where excavated at onsite and offsite areas;
H. Provide lighting for conducting night work, if applicable;
I. Provide lighted barricades and other safety equipment as necessary to protect the public for the total duration of construction. Barricades are to be in accordance with the MUTCD FHA;
J. Accept liability and responsibility for repairs, as necessary, to original condition of any and all damaged utilities, subsurface lines, structures, pavement, curbs and vegetated areas (including trees, bushes, shrubs and grass);
K. The Contractor is solely responsible for any modifications to the system if local sound ordinances are exceeded or required by the local permitting agency;
L. All equipment provided must have a 100 percent duty cycle;
M. Identify all exclusion zones and utilize appropriate excavation technologies.

5.2 Treatment Well Construction

The Contractor must comply with the following during the installation of any treatment wells as related to the approved designs.

A. All construction materials shall be new and unused;
B. Treatment wells shall be prepared for the installation of piping and individually piped to the equipment compound;
C. Install traffic rated manhole covers, concrete pads and cleanouts during trenching;
D. Wells shall be finished to grade.

5.3 Trench Excavation

A. All known utilities within the areas to be excavated shall be delineated, mapped and posted with survey flags as “no dig” areas or areas to be excavated using hand tools. If any buried utilities or related structures are encountered, they shall be flagged and properly supported and adjustments to the proposed trench area shall be made. The FDEP/LP Site Manager shall be notified of these changes from the field;
B. The Contractor shall excavate soil from the trenched areas to connect lines from proposed treatment well locations to the proposed compound;
C. Provide grading to prevent water from flowing into the trenches and excavated areas, as necessary. Contractor shall remove and promptly dispose of any accumulated water in accordance with local, state and federal regulations;
D. Backfill trenches with appropriate and clean materials;
E. Grade bottom of trench to uniform bearing and support undisturbed soil or compacted backfill resulting from over-excavation along entire length;
F. Excavated soil shall be safely stockpiled, covered and secured in designated areas or properly containerized. Soil shall not be stockpiled within two (2) feet of any excavated areas, as soils may contain gasoline constituents or other chemical compounds;

G. Trenches shall not remain open while Contractor is offsite.

5.4 Piping

A. The Contractor shall inspect all pipes and fittings for defects prior to installation. Defective materials shall not be used;

B. Piping is to remain uncovered until inspected and approved by the Engineer-of-Record.

5.5 Pipe Installation

A. All installation shall be conducted in accordance with manufacturer requirements;

B. Lay pipes on uniform grades unless otherwise agreed upon, lay gravity flow pipe upgrade beginning at the lowest grade point;

C. Open pipe ends and fittings shall be capped or temporarily covered to prevent pipe bedding, groundwater, surface water, backfill or other debris from entering piping;

D. Join piping to reflect approved design.

5.6 Pipe and Proof Testing

A. The Contractor shall employ an appropriate testing methodology to test all installed piping. Perform proof testing prior to backfilling, can be completed in sections, and must be completed in full after backfilling.

B. Performance testing of all piping shall be witnessed by the Contractor and written documentation of all test results shall be provided. Piping shall not be handled or backfilled nor personnel be in close proximity to piping during testing.

C. Proof testing should be conducted under vacuum or pressure less than 35 psi. No vacuum or pressure loss shall be observed.

5.7 Vacuum Testing of SVE Piping

A. Pipes shall be capped or plugged prior to testing. It is recommended that lines be tested prior to installation of PVC ball valves. A vacuum-rated ball valve shall be installed in the suction side of the blower that can be closed to hold vacuum in the line during testing;

B. Apply a vacuum of 50 in. W.C. to each vacuum line;

C. A minimum of one (1) vacuum gauge of appropriate range shall be utilized;

D. Pipes shall be considered tight if there is 0.0 in. W.C. of vacuum drop after thirty (30) minutes.

5.8 Low Pressure Testing of AS Piping

A. Pipes shall be capped or plugged prior to testing;

B. Pipes shall be pressured with clean air to a maximum of 5 psi. A rupture disc or shut-off head compressor shall be used to ensure test pressure does not exceed 5 psi.

C. All joints shall have a soap solution applied to verify that they are leak free;

D. Pipes shall be considered tight if there is 0.0 psi pressure drop after 30 minutes.

5.9 Backfilling and Pavement Repair

The Contractor shall not include organic materials, rocks larger than three (3) in., asphalt, concrete or poorly graded materials in the backfill. All materials under asphalt or concrete areas shall be compacted to 95% density. If Engineer-of-Record has reason to believe that proper compaction is not being obtained, then they may direct that Proctor and Field Density testing be conducted to determine the degree of compaction.

A. Metallic tape shall be placed during backfilling to facilitate future location of trenching and piping.
B. The Contractor is responsible for obtaining an approved and independent testing agency;
C. If test results indicate compaction densities less than specified, the Contractor shall secure the specified compaction using methods approved by the Engineer-of-Record;
D. All results shall be documented and shall include the facility identification name and number, name of Contractor and testing agency and location of sample tested by approximate description and depth;
E. Paved and Concrete Areas
   a. Upon installation of pipe, the trench shall be filled up to six (6) in. below grade with approved fill;
   b. Backfill shall be compacted in a maximum of four (4) in. lifts to 95% standard proctor density;
   c. Restore concrete or pavement by installing a six (6) in. thick layer of (minimum) 3,000 psi concrete with fiber mesh. The width of the concrete shall be approximately six (6) in. wider than the width of the trench such that the edges of the concrete shall be supported by a minimum of three (3) in. of undisturbed soil. If required, the concrete shall either be seal-coated or dyed to match the existing surface.

5.10 Grass/Landscaped Areas

After installation of piping, sand or pea gravel shall be filled to four (4) in. above the piping. The trench shall then be filled to grade with backfill approved by the FDEP/LP Site Manager. The Contractor shall cover compacted trench with a surface covering that matches the surrounding surface covering (i.e. grass, mulch).

5.11 Equipment Enclosure/Compound Area Construction

The Contractor shall install a remediation system enclosure and compound at the approved location. The Contractor is responsible for the construction and preparation of the fenced compound area as described below:

5.11.1 Enclosure

An enclosure with locking doors shall be provided to house the remedial system. The Contractor is responsible for final connections (including plumbing) between any off-gas treatment and the remedial system. The enclosure shall meet the additional following specifications:

A. Provide noise attenuation to levels below municipal ordinances and 70 decibels (A-weighted) maximum at ten (10) feet;
B. If portable, it shall have tie down tabs welded to the frame near corners;
C. Interior will contain: electrical lighting, ventilation fan with on/off switch and sound attenuating hood, large capacity passive vent louvers with sound attenuating hood, a thirty (30) pound ABC fire extinguisher or minimum to meet local fire code, and emergency stop button.

5.11.2 Piping Stub-Ups

Stub-ups at the compound shall be as approved in the RAP/LSRAP/RAPMOD. The Contractor must provide temporary caps (PVC or steel) on each stub-up.

5.11.3 Leveling of Compound Area

The enclosure shall be provided on a level concrete pad or existing level concrete or asphalt surface.

5.11.4 Fencing

The Contractor shall install a six (6) foot high security fence around the compound prior to system delivery. Fence poles shall be set in place with concrete and fencing shall be equipped with swing gates and locks. The Contractor shall also supply the following signs to attach to the security fence near the entrance: Danger High Voltage, Danger Flammable Gas, and No Smoking and Emergency Contractor 24-Hour Contact Information.

5.12 Electrical

The Contractor shall coordinate any electrical connection activities with the power company and an electrical contractor, as well as, coordinate with the local telephone company regarding phone connection activities for the telemetry system.

A. Under the System Installation/Integration/Startup pay items (15-4.a. through 15-4.b.), The subcontractor shall be responsible for installing wire and conduit from the temporary power pole and meter box to the remedial system. The subcontractor shall also be responsible for any minor trenching or hand digging at the power pole or equipment compound, if needed;
B. The Utility Drop pay item (15-8) is to cover costs by the utility company to provide appropriate power at the main utility lines (upgraded/additional transformers, three phase power, etc.);
C. The Utility Connection pay item (15-9) is to compensate for installation of the power pole, electric connection, and electric meter box and installing wire and conduit from the main utility line to the temporary power pole;
D. The Contractor shall coordinate with the FDEP/LP Site Manager to ensure that the electrical service account has been established;
E. The Contactor is responsible, however, for establishing telephone service accounts for the telemetry system;
F. The electrical equipment shall be protected from power surges by installing lightning protection inside the control panel;
G. The electrical system shall be sized appropriately for the efficient operation of the remedial system as detailed in the RAP/LSRAP/RAPMOD.

5.13 Site Restoration – Post Construction

The Contractor is responsible for restoring site to preconstruction conditions, including equipment and materials staging areas. The Contractor shall be responsible for removing any temporary facilities installed for construction activities. The Contractor shall obtain and maintain dated and time-stamped photographic evidence of pre-, during, and post-site conditions at a frequency of no less than ten (10) per day.

5.14 Remedial Action Construction Deliverables

The deliverable is the submission of the As-Built Drawings and Field Documentation, as specified in the Deliverables and Project Schedule.

A. As-Built Drawings

The Contractor shall submit a set of As-Built/Record Drawings, which must be signed and sealed by a registered FL P.E. These drawings shall document the completion of the RAC.

B. Field Documentation

The Contractor shall provide a copy of all waste manifests, bills of lading for materials (asphalt, concrete, soil transported off-site), field notes including summary table(s) of personnel, well construction logs, inspection results for testing and construction activities in this SOW.

6 FREE PRODUCT GAUGING AND RECOVERY

The Contractor must conduct the recovery and removal of all free product as described and approved in the RAP/LSRAP/RAP/RAPMOD and in this SOW.

Upon receipt of written approval from the FDEP/LP for the preceding task and deliverable, the Contractor will perform monitoring activities. At a minimum, the following shall be performed, recorded and reported by the Contractor during each site visit:

a. Conduct FPR and product gauging (if measurable ≥ 0.01 feet) activities at the frequency specified in the Scope of Work as approved by discussion with the FDEP/LP;
b. Gauge DTW and DTP and perform groundwater recovery as specified in the SOW Water Sampling Table;
c. If a well(s) does not contain recoverable FP (> 0.1 in.), DTW or FP thickness shall be measured and the appropriate unit cost reduction taken at the time of invoicing (substituting the number of wells where no FPR could be performed with the number of wells gauged only);
d. Perform groundwater recovery at the indicated MWs. Recovered product will be stored in appropriate containers;
e. Storage of the FP recovered at the site will be maintained until the containers are full or until the final task of this SOW. When FP is disposed of at a permitted disposal facility, provide documentation to the FDEP. Other methods of disposal must be documented. If required by the disposal facility, collect samples for laboratory analysis;
f. The Contractor shall dispose of FP and PCW generated during the FPR in accordance with PCS-006 found at: https://floridadep.gov/waste/petroleum-restoration/documents/sop-pcs-006-design-installation-and-placement-monitoring-wells;
g. Inspect all lay-in, bolt down, or locking well vaults to be monitored and status of well caps. Repair or replace any non-functioning expandable well caps;
h. Verify the integrity of every well specified in the SOW Water Sampling Table.

The deliverable is the submission of a FPR report(s), as specified in the Deliverables and Project Schedule. Each report shall contain the results of the field activities performed. The report shall include:

d. Copies of any permits obtained and not previously submitted;
e. A summary of work performed, sampling results, conclusions based on data collected and recommendations for modifications of subsequent tasks, including, as applicable: a description of any changes in land use, efforts made to locate missing wells, description of methods used to identify IDW and disposal, and any other relevant documentation related to the field activities and resultant data;
f. If applicable, a recommendation and justification for No Further Action, well abandonment and site restoration;
g. A site map depicting the locations of all SBs, compliance wells, and MWs in relation to former and current tank areas, integral piping and dispensers, buildings, land cover,

sidewalks, utilities and any public or private supply wells present onsite. Property lines and any former excavated areas shall be indicated;

h. Additional figures (with scaled and legend) shall be provided depicting, as appropriate: off-site potable wells and potential receptors, a plume map showing the lateral and vertical extent of all contaminants of concern exceeding soil and/or groundwater CTLs and/or NADCs, groundwater elevation map with elevation contours and an interpretation of the groundwater flow direction, groundwater map with elevations calculated for each MW, piezometer and compliance well, contamination map illustrating the degree of soil and/or groundwater contamination at each boring and well location with sampling dates and analytical data; OVA map depicting highest OVA reading for each boring location;
i. Figures showing the FP thickness illustrated prior to FPR activities and from the final FP gauging/recovery event at each well location;
j. Tabulated soil and groundwater data, including historical and current status of wells must be reflected in all groundwater tables;
k. Tabulated data shall include DTP, thickness of product (before and after FPR), volume of water and product recovered (during each event and cumulative over time), and condition of product (color, odor, weathering);
l. SB, MW, groundwater and instrument calibration logs, as applicable;
m. Laboratory report(s), COC(s) and NELAP certification for the field work conducted;
n. Disposal manifests, weight tickets and/or certificates of treatment or disposal;
o. Copy of all field notes.

7 SOURCE REMOVAL ACTIVITIES

The Contractor shall conduct soil removal activities per the approved RAP/LSRAP/RAPMOD.

7.1 Soil Sampling

The Contractor shall conduct soil sampling for disposal, backfill and confirmation purposes and send to a laboratory for analysis per the SOW Soil Boring and Monitoring Well Installation Table.

7.1.1 Pre-burn

The Contractor shall hand auger SBs from representative areas of the soil that will be excavated for disposal, based on disposal facility requirements for the number of samples by volume. All samples must be collected from the vadose zone of excavation footprint.

7.1.2 Backfill

The Contractor shall collect two (2) grab samples and one (1) composite sample according to the October 1, 2010 Backfill Sampling Guidance. One of the grab samples must be analyzed for volatile organic compounds (VOCs) by EPA method 8260, and the other grab sample must be analyzed for semi-volatile organic compounds (SVOCs) by EPA Methods 8270, 8081 and 8082 and TRPHs by the FL-PRO Method. The composite sample must be analyzed for the eight (8) Resource Conservation & Recovery Act (RCRA) metals by EPA Method 6010 and EPA Method 7471 or EPA Method 6020. Samples must be collected from the area that is anticipated to be used for this project.

7.1.3 Confirmatory

Prior to backfilling, soils shall be screened and analyzed along the sidewalls and floor (if not below water table) per the approved RAP/LSRAP/RAPMOD, Design Specifications and the SOW

Soil Boring and Monitoring Well Installation Table and SOW Water Sampling Table. If laboratory results indicate SCTL exceedances, the Contractor shall discuss with the FDEP/LP the need for additional soil removal.

7.2 Photographic Documentation

The Contractor shall take photographs of each building that is within at least 100 feet of the source removal area. The photographs must include distance and up-close photographs (including photos of pre-excavation cracks, corners, ceilings and roof lines). The photos must be of sufficient quality to calculate scale and level of the items in the photograph.

7.3 Structural

The Contractor and their subcontractors are responsible for evaluating and ensuring the structural integrity any buildings impacted by the source removal activities.

7.4 Site Security

The Contractor shall install temporary fencing to surround the excavation area. This fencing shall remain in place throughout the duration of the excavation activities. Fencing shall be a minimum of six (6) feet in height and secured when Contractor not present to prevent access to excavation pit or related materials.

7.5 Surface Removal

The Contractor shall remove any concrete or asphalt surface cover located in the excavation area for disposal according to the SOW Source Removal Table. Disposal must be at a licensed construction and debris landfill approved by the FDEP/LP. Construction debris must not be used as backfill material.

7.6 Sheet Piling Installation

Prior to soil removal activities, the Contractor shall install sheet piling in accordance with design and details approved in the RAP/LSRAP/RAPMOD and Design Specifications.

7.7 Contaminated Soil Removal

The Contractor shall excavate contaminated soils as approved in the RAP/LSRAP/RAPMOD, Design Specifications and as detailed in the SOW Source Removal Table. Contingency excavation activities are included in this SOW, however, supporting documentation must be provided and approved by the FDEP/LP prior to proceeding.

A. All excavated soil must be characterized, tracked (i.e. waste manifests and weight tickets) and disposed of at a FDEP approved waste management facility and must meet the requirements of the receiving facility;
B. Contents of all stockpiled soils must be properly stored and roll-offs, dump trucks, and transport trucks must be covered during transport. If necessary, the Contractor will erect dikes, berms or other temporary coverings to prevent storm waters from coming into contact with stockpiled soils or entering the excavation pit.

7.8 Groundwater Removal and Disposal

If the depth of the source removal extending into the water table, it is anticipated that groundwater will seep into the excavation and require removal and treatment to access all of the contaminated soils. A dewatering system will be installed by the Contractor to lower the water table prior to and during the excavation activities and extracted groundwater treated and disposed of as approved in

the RAP/LSRAP/RAPMOD and Design Specifications. Influent and effluent groundwater shall be monitored, sampled and analyzed per the SOW.

7.9 Backfill

Soil removed and transported off-site for disposal will be replaced with clean backfill that has been analyzed per the SOW Soil Boring and Monitoring Well Installation Table. The top six (6) in. of the excavated area will be further restored as follows.

7.10 Compaction

All backfill must be compacted and the Contractor shall conduct compaction testing as follows:

A. Compaction shall be conducted using a roller or mechanical vibrating compactor in twelve (12) in. lifts (maximum);
B. The Contractor shall conduct the Standard Proctor Maximum Density Testing. The Contractor will collect one (1) QC sample of backfill material for density analyses, to be determined using AASHTO T-99, Method C. QC samples will be collected at a frequency of one sample per LOT. A LOT is defined as one lift of backfill material placement spread across the excavation area;
C. Density tests shall be conducted per the SOW Source Removal Table;
D. Each test must meet a density of at least 95%;
E. Re-compaction and re-testing due to inadequate compaction results shall be the responsibility of the Contractor and at no additional cost to the FDEP/LP.

7.11 Resurfacing

Upon completion of all excavation, backfill and compaction activities, the Contractor shall resurface the area disturbed in accordance with the SOW Source Removal Table. The replacement concrete must be six (6) in. thick and must have a strength of 3,000 psi with fiber mesh and expansion joints (if required). Replacement asphalt must be two (2) in. thick with sub-base. Grassy areas must be replaced with sod.

7.12 Site Restoration – Post Construction

The Contractor is responsible for restoring site to preconstruction conditions, including equipment and materials staging areas. The Contractor shall be responsible for removing any temporary facilities installed for construction activities. The Contractor shall obtain and maintain dated and time-stamped photographic evidence of pre-, during, and post-site conditions at a frequency of no less than ten (10) per day.

7.13 Soil Source Removal Report

The Contractor will detail all efforts conducted to remove the primary source of soil and/or groundwater contamination as discussed and approved by the FDEP/LP. The deliverable is the submission of a Source Removal report, as specified in the Deliverables and Project Schedule. Each report shall contain the results of the field activities performed, and shall include at a minimum:

A. Copies of any permits obtained and not previously submitted;
B. A summary of work performed, sampling results, conclusions based on data collected and recommendations for modifications of subsequent tasks, including, as applicable: a description of any changes in land use, efforts made to locate missing wells, description of methods used to identify IDW and disposal, and any other relevant documentation related to the field activities and resultant data;

C. If applicable, a recommendation and justification for No Further Action, well abandonment and site restoration;
D. A site map depicting the locations of all SBs, compliance wells, and MWs in relation to former and current tank areas, integral piping and dispensers, buildings, land cover, sidewalks, utilities, and any public or private supply wells present onsite. Property lines and any former excavated areas shall be indicated;
E. Additional figures (with scale and legend) shall be provided depicting, as appropriate: off-site potable wells and potential receptors, a plume map showing the lateral and vertical extent of all contaminants of concern exceeding soil and/or groundwater CTLs and/or NADCs, groundwater elevation map with elevation contours and an interpretation of the groundwater flow direction, groundwater map with elevations calculated for each MW, piezometer and compliance well, contamination map illustrating the degree of soil and/or groundwater contamination at each boring and well location with sampling dates and analytical data, OVA map depicting highest OVA reading for each boring location;
F. Tabulated soil and groundwater data, including historical and current status of wells must be reflected in all groundwater tables;
G. SB, MW, groundwater and instrument calibration logs, as applicable;
H. Laboratory report(s), COC(s) and NELAP certification for the field work conducted;
I. Disposal manifests, weight tickets and/or certificates of treatment or disposal;
J. Copy of all field notes.

8 REMEDIAL SYSTEM STARTUP ACTIVITIES

The Contractor shall, per Rule 62-780, F.A.C., and the approved RAP/LSRAP/RAPMOD, engage in the proper startup of a remedial system. These activities, at a minimum, must include testing all plumbing and electrical components, telemetry equipment and required sampling as noted below. Additional sampling, if needed, shall be performed as required by a NPDES permit.

8.1 System Startup Visit

Additional parameters to be collected are as follows:

A. Record system process equipment and operational run time hour meter readings;
B. Record vacuum and flow at each manifold line;
C. Inspect blower, record flow and suction at the blower, inspect all filters and clean or replace;
D. Record flow meter reading at the moisture separator, inspect floats at each separator and operation of transfer pump at each separator;
E. Record pressure readings and flow for each remediation point and well, inspect sparge compressor, record temperature and pressure at compressor, inspect all filters and clean or replace. The Contractor shall collect DTW measurements, D.O. readings, and O&M parameters during each event as specified in the O&M Parameter Table;
F. Obtain system air samples as specified in the SOW Soil and Air Sampling Table;
G. Obtain system groundwater samples as specified in the SOW Water Sampling Table;
H. Perform OVA-PID screening of the recovered vapors. The levels of explosive vapors in the combined extracted air stream will be monitored. The air dilution valve on the system shall be adjusted to maintain the hydrocarbon concentration in the extracted air stream below 25% of the LEL. The LEL for gasoline vapors is estimated to be 14,000 pm;
I. Perform any system repairs or maintenance, including preventative maintenance, as required to maintain proper system operation and document on an O&M checklist;

J. Perform any necessary repairs on the compound fencing, gates, enclosures, cover, weed control and general housekeeping.

8.2 Remedial System Startup Report

The deliverable is the submission of a System Startup report, detailing the initial startup activities and demonstrating that the remedial system is performing according to the approved manufacturer specifications, as specified in the Deliverables and Project Schedule. Each report shall contain the results of the field activities performed, and shall include at a minimum:

A. Copies of any permits obtained and not previously submitted;
B. A summary of work performed, sampling results, conclusions based on data collected and recommendations for modifications of subsequent tasks, including, as applicable: a description of any changes in land use, efforts made to locate missing wells, description of methods used to identify IDW and disposal, and any other relevant documentation related to the field activities and resultant data;
C. Summary of work shall also include: any system repairs, modifications or maintenance per manufacturer's recommendations, provide methodology used to evaluate the effectiveness of the remedial system;
D. If applicable, a recommendation and justification for No Further Action, well abandonment and site restoration;
E. A site map depicting the locations of all SBs, compliance wells, and MWs in relation to former and current tank areas, integral piping and dispensers, buildings, land cover, sidewalks, utilities, and any public or private supply wells present onsite. Property lines and any former excavated areas shall be indicated;
F. Additional figures (with scale and legend) shall be provided depicting, as applicable to this SOW: off-site potable wells and potential receptors, a plume map showing the lateral and vertical extent of all contaminants of concern exceeding soil and/or groundwater CTLs and/or NADCs, groundwater elevation map with elevation contours and an interpretation of the groundwater flow direction, groundwater map with elevations calculated for each MW, piezometer and compliance well, contamination map illustrating the degree of soil and/or groundwater contamination at each boring and well location with sampling dates and analytical data, OVA map depicting highest OVA reading for each boring location;
G. As-built drawings (red lined), signed and sealed and Figures depicting the baseline groundwater and/or soil plume(s), distribution of pressure/vacuum readings, D.O. measurements and water level elevations under system operating conditions;
H. Tabulated soil and groundwater data, including historical and current status of wells must be reflected in all groundwater tables;
I. Tabulated summaries, including historical, of all system performance data;
J. SB, MW, groundwater and instrument calibration logs, as applicable;
K. Laboratory report(s), COC(s) and NELAP certification for the field work conducted;
L. Disposal manifests, weight tickets and/or certificates of treatment or disposal;
M. Copy of all field notes.

9 OPERATION AND MAINTENANCE

The Contractor will mobilize to the site monthly, or as otherwise detailed in the approved RAP/LSRAP/RAPMOD to conduct the proper maintenance of the remedial system and to ensure that all system components are performing according to the manufacturer's specifications.

9.1 Operation and Maintenance Site Visits

The Contractor will, at a minimum, conduct, record and report the following during each site visit:

A. Record system process equipment and operational run time hour meter readings;
B. Record vacuum and flow at each manifold line;
C. Inspect blower, record flow and suction at the blower, inspect all filters and clean or replace;
D. Record flow meter reading at the moisture separator, inspect floats at each separator and operation of transfer pump at each separator;
E. Record pressure readings and flow for each remediation point and well, inspect sparge compressor, record temperature and pressure at compressor, inspect all filters and clean or replace. The Contractor shall collect DTW measurements, D.O. readings, and O&M parameters during each event as specified in the O&M Parameters Table;
F. Obtain system air samples as specified in the SOW Soil and Air Sampling Table;
G. Obtain system groundwater samples as specified in the SOW Water Sampling Table;
H. Perform OVA-PID screening of the recovered vapors. The levels of explosive vapors in the combined extracted air stream will be monitored. The air dilution valve on the system shall be adjusted to maintain the hydrocarbon concentration in the extracted air stream below 25% of the LEL. The LEL for gasoline vapors is estimated to be 14,000 pm;
I. Perform any system repairs or maintenance, including preventative maintenance, as required to maintain proper system operation and document on an O&M checklist;
J. Perform any necessary repairs on the compound fencing, gates, enclosures, cover, weed control and general housekeeping.

9.2 System Performance

The average monthly remediation system performance shall be within ±20% of the design capacity specified in the RAP or the optimum capacity observed during startup, whichever is less, for each of the major treatment processes at the point of recovery or treatment, including flow rates, vacuum pressures, injection pressures, etc. This variance is intended for overall performance evaluation and shall not be construed to imply that deviation from any critical performance or safety design thresholds established in other FDEP rules or guidance are acceptable. Exceptions shall be considered where, in the interest of dynamic site management, the Contractor intentionally modifies flow rates or pressure to or from individual RWs or treatment points to optimize the system effectiveness. Any such changes that would exceed the ±20% limit shall require notification to the FDEP/LP Site Manager prior to implementation and request for submittal of a RAP Modification.

9.3 Preventative Maintenance

The Contractor shall conform to the manufacturer's recommended maintenance requirements for all equipment and document use of comprehensive Preventative Maintenance checklist.

9.4 Episodic Site Visits

The Contractor shall conduct episodic remedial treatment activities per the approved RAP/LSRAP/RAPMOD. Additional sampling, if needed, shall be performed as required by a NPDES permit. The Contractor shall also provide a treatment system that, at a minimum, meets the requirements as detailed in the RAP/LSRAP/RAPMOD, subsequent Construction Drawings and/or Design Specifications. At a minimum, the Contractor shall collect, record and report the following:

A. Operate the system(s) concurrently, if applicable, and record wellhead pressure/vacuum at all remedial wells and laterals, flow rates, and any other relevant observations;

B. Collect O&M Parameters prior to system startup and daily during the startup per the O&M Parameter Table;
C. Obtain system air samples as specified in the SOW Soil and Air Sampling Table;
D. Obtain system groundwater samples as specified in the SOW Water Sampling Table.

9.5 Quarterly/Annual Groundwater Sampling

The groundwater samples will be analyzed for the analytical parameters specified in the SOW. Static sampling must be employed during annual O&M sampling events. The Contractor shall submit the groundwater samples to a NELAP certified laboratory analysis. If Baseline Sampling, the Contractor shall conduct this event within thirty (30) days prior to system startup. At a minimum, the following shall be performed, recorded and reported:

A. Gauge DTW and collect samples for the analytical parameters specified in the SOW Water Sampling Table. Do not sample wells with FP or submerged screens;
B. Collect stabilization field measurements of conductivity, D.O., pH, temperature, and turbidity. NAM Parameters (including ORP), if collected, must be taken from at least three (3) wells; source, upgradient from and downgradient from source;
C. For newly installed wells, collect TOC elevations;
D. Inspect all lay-in, bolt down, or locking well vaults to be monitored and status of well caps. Repair or replace any non-functioning expendable well caps;
E. Verify the integrity of every well specified in the SOW Water Sampling Table, prior to sampling. Standing water must be removed before opening well caps;
F. Contractor shall dispose of FP and PCW generated in accordance with PCS-006 found at: https://floridadep.gov/waste/petroleum-restoration/documents/sop-pcs-006-design-installation-and-placement-monitoring-wells.

9.6 O&M Report

The deliverable is the submission of Quarterly and Annual O&M report(s), as specified in the Deliverables and Project Schedule. Each report shall contain the results of the field activities performed, and shall include at a minimum:

A. Copies of any permits obtained and not previously submitted;
B. A summary of work performed, sampling results, conclusions based on data collected and recommendations for modifications of subsequent tasks, including, as applicable: a description of any changes in land use, efforts made to locate missing wells, description of methods used to identify IDW and disposal, and any other relevant documentation related to the field activities and resultant data;
C. Summary of work shall also include: an evaluation of the cleanup progress relative to the milestone objectives as specified in the RAP/LSRAP/RAPMOD, an explanation for not achieving cleanup objectives and the specific steps taken to improve future performance;
D. If Episodic Treatment, Summary of work shall also include: a discussion of flow rate, vacuum pressure and/or injection pressures;
E. If applicable, a recommendation and justification for No Further Action, well abandonment and site restoration;
F. A site map depicting the locations of all SBs, compliance wells, and MWs in relation to former and current tank areas, integral piping and dispensers, buildings, land cover, sidewalks, utilities, and any public or private supply wells present onsite. Property lines and any former excavated areas shall be indicated;
G. Additional figures (with scale and legend) shall be provided depicting, as appropriate: off-site potable wells an potential receptors, a plume map showing the lateral and vertical

extent of all contaminants of concern exceeding soil and/or groundwater CTLs and/or NADCs, groundwater elevation map with elevation contours and an interpretation of the groundwater flow direction, groundwater map with elevations calculated for each MW, piezometer and compliance well, contamination map illustrating the degree of soil and/or groundwater contamination at each boring and well location with sampling dates and analytical data, OVA map depicting highest OVA reading for each boring location;

H. Tabulated soil and groundwater data, including historical and current status of wells must be reflected in all groundwater tables;
I. Tabulated data, including historical, of all O&M Parameters and system performance data;
J. SB, MW, groundwater and instrument calibration logs, as applicable;
K. Laboratory report(s), COC(s) and NELAP certification for the field work conducted;
L. Disposal manifests, weight tickets and/or certificates of treatment or disposal;
M. Copy of all field notes.

10 NATURAL ATTENUATION or POST-ACTIVE REMEDIATION MONITORING

The Contractor shall perform soil and/or groundwater sampling per this SOW. Static sampling must be employed during quarterly O&M sampling events.

10.1 Soil Boring Installation

The Contractor shall conduct soil sampling and analyses, including the installation of SBs in the areas agreed upon with the FDEP/LP Site Manager to more fully identify the extent of contaminated soil at the site. The Contractor, at a minimum, must perform the following:

A. Advance SBs to the depths noted in the SOW Soil Boring and Monitoring Well Installation Table;
B. Collect and document lithological descriptions and moisture content continuously to the total depth of each borehole;
C. Screen soils using an OVA-PID or OVA-FID at the depth intervals noted in the SOW Soil Boring and Monitoring Well Installation Table.

10.2 Soil Sampling

The Contractor shall obtain and record soil samples at the intervals and locations per discussions with the FDEP/LP Site Manager. The soil samples will be analyzed for the analytical parameters agreed upon or per the SOW Soil Boring and Monitoring Well Installation Table. Soil sampling and analyses must allow for the collection of additional aliquots for SPLP extraction and/or for Fractionation. The laboratory must be instructed on the COC to hold the analysis of these samples until approved by the FDEP/LP Site Manager. The Contractor must submit the soil samples to a NELAP certified laboratory for analysis.

10.3 Groundwater Sampling

The Contractor will allow newly installed wells to equilibrate and sample not less than twenty-four (24) hours after installation. The groundwater samples will be analyzed for the analytical parameters specified in the SOW Water Sampling Table. The Contractor shall submit the groundwater samples to a NELAP certified laboratory analysis. At a minimum, the following shall be performed, recorded and reported:

A. Gauge DTW and collect samples for the analytical parameters specified in the SOW Water Sampling Table. Do not sample wells with FP or submerged screens;

B. Collect stabilization field measurements of conductivity, D.O., pH, temperature, and turbidity. NAM Parameters (including ORP), if collected, must be taken from at least three (3) wells; source, upgradient from and downgradient from source;
C. For newly installed wells, collect TOC elevations;
D. Inspect all lay-in, bolt down, or locking well vaults to be monitored and status of well caps. Repair or replace any non-functioning expendable well caps;
E. Verify the integrity of every well specified in the SOW Water Sampling Table, prior to sampling. Standing water must be removed before opening well caps;
F. Contractor shall dispose of FP and PCW generated in accordance with PCS-006 found at: https://floridadep.gov/waste/petroleum-restoration/documents/sop-pcs-006-design-installation-and-placement-monitoring-wells.

10.4 Natural Attenuation or Post RA Monitoring Report

The deliverable is the submission of Quarterly and Annual NAM/PARM report(s), as specified in the Deliverables and Project Schedule. Each report shall contain the results of the field activities performed, and shall include at a minimum:

A. Copies of any permits obtained and not previously submitted;
B. A summary of work performed, sampling results, conclusions based on data collected and recommendations for modifications of subsequent tasks, including, as applicable: a description of any changes in land use, efforts made to locate missing wells, description of methods used to identify IDW and disposal, and any other relevant documentation related to the field activities and resultant data;
C. Summary of work shall also include: necessity to continue monitoring, validation and re-calibration of any models used, and re-establishment of new milestone objectives, an evaluation of data to determine if a groundwater contaminant trend exists;
D. If applicable, a recommendation and justification for No Further Action, well abandonment and site restoration;
E. A site map depicting the locations of all SBs, compliance wells, and MWs in relation to former and current tank areas, integral piping and dispensers, buildings, land cover, sidewalks, utilities, and any public or private supply wells present onsite. Property lines and any former excavated areas shall be indicated;
F. Additional figures (with scale and legend) shall be provided depicting, as appropriate: off-site potable wells an potential receptors, a plume map showing the lateral and vertical extent of all contaminants of concern exceeding soil and/or groundwater CTLs and/or NADCs, groundwater elevation map with elevation contours and an interpretation of the groundwater flow direction, groundwater map with elevations calculated for each MW, piezometer and compliance well, contamination map illustrating the degree of soil and/or groundwater contamination at each boring and well location with sampling dates and analytical data, OVA map depicting highest OVA reading for each boring location;
G. Figures (with scale and legend) demonstrating contaminant trends for all sampling events by providing the following plot: Concentrations v. Distance using the centerline of the plume, and Concentrations v. Time for each MW sampled;
H. An assessment of metabolic byproduct by plotting an isoconcentration map (with scale and legend) of methane;
I. Tabulated soil and groundwater data, including historical and current status of wells must be reflected in all groundwater tables;
J. SB, MW, groundwater and instrument calibration logs, as applicable;
K. Laboratory report(s), COC(s) and NELAP certification for the field work conducted;

L. Disposal manifests, weight tickets and/or certificates of treatment or disposal;
M. Copy of all field notes.

11 WELL ABANDONMENT/SITE RESTORATION ACTIVITIES

11.1 Well Abandonment

The Contractor will oversee and/or conduct the abandonment of all compliance (if applicable), monitoring, system, injection, and piezometer wells associated with the discharge for this SOW and per the SOW Well Abandonment Table. Wells shall be abandoned by filling the casing with grout from the bottom up using the tremie pipe method.

11.2 Site Restoration

The Contractor is responsible for restoring all areas to pre-assessment and remediation activity conditions as acceptable to the FDEP/LP, the Property Owner/On-Site Representative and any other affected off-site property owners. The Contractor shall be responsible for removing any temporary facilities. The Contractor shall obtain and maintain dated and time-stamped photographic evidence of all restoration (including well abandonment locations) activities.

11.3 Well Abandonment/Site Restoration Report

The deliverable is the submission of a Well Abandonment and Site Restoration report, as specified in the Deliverables and Project Schedule. The Contractor shall record and report the following:

A. Copies of any permits obtained and not previously submitted;
B. A summary of the work performed and any other relevant documentation;
C. A site map showing the locations of all abandoned wells and system piping;
D. Well completion logs for all wells abandoned;
E. Waste manifests and bills of lading for materials for disposal;
F. Photographic documentation of well abandonment and restoration activities;
G. Copy of field notes.