Specifications

ENV-HMM Contracting Standard Operating Procedures (SOP)

TxDOT Environmental Affairs Division
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510.01.SPC
Version 6

The following Standard Operating Procedures (SOPs) are designed to be used when initiated by specific contract statements-of-work administered by the Hazardous Materials Management Branch in the Environmental Affairs Division (ENV) of TxDOT. These SOPs can be used by other contracting entities inside or outside of TxDOT.

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100 Project Deliverables

100.1 Description: This Standard Operating Procedure (SOP) identifies the content, form, and procedures required for submittal and acceptance by ENV of deliverable work products (deliverables) from contracted entities, as specified in the Work Authorization (WA) or contract.

100.2 Procedures: The following procedures and criteria apply and are applicable for all executed WA(s) and any subsequently executed Supplemental WA(s) administered by ENV.

Status Reports – The Contractor shall prepare either a monthly or a weekly Status Report for each executed WA. The Contractor shall only prepare a weekly Status Report when directed by the Statement of Work (SOW). The Contractor shall utilize the Status Report form, supplied by ENV, for all progress reporting. The Contractor shall submit all Status Reports via e-mail to the ENV Project Manager and other individuals designated within the SOW.

Deliverable(s)
Draft Reports – The Contractor shall submit all Draft Reports or other draft work products (drawings, plans, flow charts, cost estimates, etc.) by e-mail, Box.com or similar file transfer site, or in a format specified in the SOW. The Contractor shall submit all Draft Reports technically complete and free of typos and grammatical errors.

Mid-Project Deliverable(s) (if applicable) – Upon acceptance of the draft deliverable(s) by TxDOT, the Contractor shall submit the accepted, final, mid-project deliverables via e-mail, Box.com or similar file transfer site, or in a format detailed by the SOW to the ENV Project Manager and to other individuals designated within the SOW.

Contractor Final Deliverable Packet (CFDP): The contractors shall submit to TxDOT a Final Deliverable Packet in PDF format with all deliverables related to that Work Authorization (including supplementals). This is considered the Final Deliverable Packet and may be separate from individual deliverables required by the WA. Submit via e-mail, Box.com or similar file transfer site, or in a format detailed by the SOW to the ENV Project Manager and to other individuals designated within the SOW.

Regulatory Derived Deliverables – The Contractor shall prepare the Regulatory Derived Deliverable(s) (e.g. PST program report forms, APAR, etc.) in accordance with the most current format specified by the regulatory agency. In addition, the Contractor shall follow the general procedures outlined above for the different deliverables. Once approved by TxDOT, the Contractor shall prepare the final regulatory copies with the required information and original signatures, seals and/or licensing proofs and submit it to the ENV Project Manager for countersignature. The Contractor shall submit the Regulatory Derived

Deliverable(s) to the appropriate regulatory agency, unless otherwise directed by the SOW.

Deliverable Schedule – The Contractor shall submit all deliverables to TxDOT in accordance with the schedule outlined in the SOW.

101 Consultant Invoicing

101.1 Description: The following procedures outline the requirements for the Environmental Affairs Division of TxDOT (ENV) to accept invoices from contracted entities for payment.

101.2 Forms: The Contractor shall submit all forms required by the contract, and as requested by ENV.

101.3 Procedures: The following procedures are required for all invoices submitted as a request for payment for work performed in accordance with executed Work Authorizations (WA) and subsequent Supplemental WA(s) administered through ENV.

Invoice – The Contractor shall not process invoices without proof of work performed, either through Monthly Status Reports (MSR) or through a project deliverable accepted by the TxDOT project manager.

- Each invoice must use the most up to date coversheet template available from ENV Contracts. Templates can be requested from ENV_Contracts@txdot.gov.

Invoice Summary Sheet – The Contractor shall include a cost breakdown of the following items for each task outlined in the approved WA/ Supplemental WA(s):

- Total amount of WA, plus Supplemental WA(s)
- Current invoice amount
- Previous invoice amounts (cumulative total)
- Remaining budget

Labor – The Contractor shall include a labor summary sheet. The labor summary sheets **must** include dates of services (per day, not a lump sum period of time), personnel names, labor category, task, and hours worked per day. All labor categories in the invoice must match the titles in the contract. The Contractor shall keep timesheets, or another acceptable form of detailed project work records, for proof of work as part of their contractual record keeping. TxDOT can audit the timesheets at any time. The labor summary sheets **must** agree with the invoice service dates. The Contractor shall clearly show total hour(s) worked on the labor summary sheets. To avoid confusion, the Contractor may omit or cross out all other work not related to the invoiced WA.

Other Unit Costs – The Contractor shall include itemized receipts or other detailed records acceptable to ENV for all unit cost items included in the invoice. The itemized receipt/record must clearly indicate the number of units completed or expended for the service dates included on the invoice and to what task the unit cost applies. TxDOT will reimburse based on units completed and not on partial payments.

Other Direct Expenses – The Contractor shall include itemized receipts, or other detailed records acceptable to ENV Contracts, for direct expense items included on the invoice. For Fixed Cost items, the itemized receipt/record must clearly indicate the number of units completed or expended for the service dates included on the invoice and to what task the expense applies.

Lodging and Meals – TxDOT will only reimburse meals with proof of overnight lodging or with an approval from ENV for reimbursement for non-overnight/travel days. The invoice must include a lodging receipt as backup documentation for an overnight stay. All lodging receipts must be itemized and include the personnel name(s), date(s), and location.

TxDOT will reimburse meal expenses and lodging at actual cost that can't exceed current GSA rates for the specific location and date. The Contractor shall only submit itemized meal receipts (credit card receipts are not acceptable) to document usage. Gratuities/tips, non-food items, tobacco, alcohol and alcohol related taxes are not reimbursable.

All invoices that include lodging and meal receipts must include a fieldwork tracking sheet. The Contractor shall use the most up to date fieldwork tracking sheet template when the invoice is created. The template is available by contacting ENV_Contracts@txdot.gov

Final Invoice – The Contractor shall mark each final invoice for a WA with the words "Final Invoice". In addition, the Contractor shall submit along with the final invoice a WA decommit form completed and signed by the Contractor. After submitting the final invoice, the Contractor shall not submit any additional charges to the project.

All invoicing back up documentation must be legible and well organized.

Any deviations from the WA budget must be approved via email by ENV Contracts prior to invoicing and included with the invoice submission.

102 Using ENV Contracted Analytical Laboratory Services

102.1 Description: This item sets forth the procedures for using ENV-contracted analytical laboratory services.

102.2 Procedures: The Contractor in conjunction with the ENV Project Manager (PM) shall determine the number and type of samples of environmental media to be collected to meet the Project Objectives. The Statement of Work prepared for the project shall show the number and type of samples and analytes represented in a table, as shown below in Table 1 (Soil/Solid 7 Calendar Day Turnaround Time), Table 2 (Soil/Solid 24-Hour Turnaround Time), Table 3 (Water 7 Calendar Day Turnaround Time) and Table 4 (Water 24-Hour Turnaround Time). The Contractor shall attempt to anticipate all contingencies in preparing the Table to prevent emergency lab analysis requests.

102.2.1 The ENV PM may solicit bids from one or more Contract Laboratories to determine the Best Value for the State.

102.2.2 The ENV PM shall deliver the Approved PO Request to ENV Contracts for issuance of a PO Release to the selected Contract Laboratory.

102.2.3 The ENV Contracts staff shall prepare and transmit the PO Release to the Contract Laboratory and to the ENV PM.

102.2.4 The ENV PM shall notify the Contractor of the selected Contract Laboratory, contact information, and the PO Release Number for the selected Contract Laboratory.

102.2.5 The Contractor shall order sample kits from the appropriate Contract Laboratory. Sample kit orders should reference the TxDOT PO Release number to ensure that the correct sample kits are ordered.

102.2.6 The Contractor shall collect, properly preserve, label, prepare the Chain-of-Custody, and ship/deliver all samples to the Contract Laboratory. The Chain-of-Custody documentation will need to reference the TxDOT PO Release number.

102.3 Communication: The Contractor shall not order any additional analyses or change the Turnaround Time (TAT) directly with the Contract Laboratory. Communicate to the ENV PM any additional analyses that may be required due to unanticipated field conditions or the need for rushed analytical results. The ENV PM shall solicit costs from the Contract Laboratory and issue a new PO Release for the additional analyses or expedited TAT. In no case will the Contractor request additional analytical services or change TAT directly with the Contract Laboratory without the approval of the ENV PM.

102.4 Reporting: The Contract Laboratory shall send the completed Analytical Laboratory Report to the Contractor and the ENV PM within the specified TAT. Contact the ENV PM if the Contract Laboratory fails to meet the specified TAT.

102.5 Billing: The Contract Laboratory shall send all invoices for Analytical Services to TxDOT for payment. In the event the Contract Laboratory sends an invoice to the Contractor, the Contractor shall immediately notify and transmit the Contract Laboratory invoice to the ENV PM.

TABLE 1 – SOIL/SOLID 7 CALENDAR DAY TURNAROUND TIME			
Line Item	**Soil/Solid Analytical**	Estimated # of Analyses	Special Instruction (hold, etc.)
1	Metals (one metal) (EPA 3050/6010/6020/7471)		
2	Metals (8 RCRA metals) (EPA 3050/6010/6020/7471)		
3	Metals (Total 30 metals) (EPA 3050/6010/6020/7471)		
4	Metals (TCLP 8 RCRA metals) (EPA 1311/6010/6020/7470)		
5	Metals (SPLP 8 RCRA metals) (EPA 1312/6010/6020/7470)		
6	Metals (TCLP one metal) (EPA 1311/6010/6020/7470)		
7	Metals (SPLP one metal) (EPA 1312/6010/6020/7470)		
8	Metals (Priority Pollutant (PP-13)) (EPA 200.7/200.8/245.1/6010/6020/7471)		
9	Volatiles (Total Volatile Organics) (EPA 5035/8240 or 8260)		
10	Volatiles (Halogenated Volatile Organics) (EPA 5030, 5035/8021)		
11	Volatiles (BTEX + MTBE) (EPA 5035/8021)		
12	Volatiles (BTEX + MTBE) (EPA 5035/8260)		
13	Volatiles (BTEX) (EPA 5035/8260)		
14	Volatiles (TCLP) (EPA 1311/8260)		
15	Volatiles (SPLP) (EPA 1312/8260)		
16	Semi-volatiles (Total Semi-volatiles) (EPA 3540, 3541, 3550/8270)		
17	Semi-volatiles (PAHs) (EPA 3540, 3541, 3550/8270)		
18	Semi-volatiles (PCBs) (EPA 3540, 3541, 3550/8082)		
19	Semi-volatiles (TCLP) (EPA 1311/8270)		
20	Semi-volatiles (SPLP) (EPA 1312/8270)		
21	Total Petroleum Hydrocarbons (TCEQ 1006)		
22	Total Petroleum Hydrocarbons (TCEQ 1005)		
23	Total Petroleum Hydrocarbons (one range) (EPA 5030, 5035/8015 GC Scan)		
24	Fuel Fingerprint		
25	Pesticides (SW-846 8081)		
26	Herbicides (SW-846 8151/8321)		
27	Glycols (SW-846 8015)		

28	Per- and Polyfluoroalkyl Substances (PFAS) (EPA 1633)		
29	Tentatively Identified Compounds		
30	Geotechnical Parameters (All) to include: Dry Bulk Density, Effective Porosity, FOC, and Intrinsic Permeability		
31	Dry Bulk Density		
32	Effective Porosity		
33	Fraction Organic Carbon (FOC) (Walkley-Black)		
34	Intrinsic Permeability		
35	Unified Soil Classification System (USCS) Determination (ASTM D2487)		
36	Water Content (ASTM D2216)		
37	pH		
	Characteristic Tests		
38	Reactivity, Corrosivity, and Ignitibility (RCI)		
39	Total Organic Halogens (TOX, EOX)		
	Various Analyses		
40	Radium Isotopes (EPA 903) – Alpha emitting radioisotopes		
41	Gamma Spectrometry (EPA 901.1)		
42	Carbon 14 (EERF C-01)		
43	Cesium 137 (EPA 901.1)		
44	TCLP Extraction (EPA 1311)		
45	TCLP RCRA 11 Metals (SW-846 6020/7470)		
46	Oil and Grease (SW-846 9071/1664)		
47	Cyanide (SW-846 9010/9014)		
48	Oil and Grease Extraction (SW-846 9071)		
49	Dioxins/Furans (SW-846 8290/PAM 16130)		
50	Gross Alpha-Beta (EPA 900)		
51	SPLP Extraction (EPA 1312)		
52	SPLP 13 Metals (SW-846 6020/7470)		
53	SPLP TPH (TCEQ 1005)		
54	Terracore Samplers		
55	Pesticides (SW-846 8141)		
56	SPLP Pesticides (SW-846 8081)		
57	SPLP Herbicides (SW-846 8151/8321)		
58	ACM by Polarized Light Microscopy (EPA 600/R-93/116) 7-day TAT		
59	ACM by Point Count Method (EPA 600/R-93/116) 7-day TAT		
	TRRP Report		
60	Laboratory Review Checklist		
TABLE 2 – SOIL/SOLID 24-HOUR TURNAROUND TIME			
Line Item	**Soil/Solid Analytical**	Estimated # of Analyses	Special Instruction (hold, etc.)

61	Metals (one metal) (EPA 3050/6010/6020/7471)		
62	Metals (8 RCRA metals) (EPA 3050/6010/6020/7471)		
63	Metals (Total 30 metals) (EPA 3050/6010/6020/7471)		
64	Metals (TCLP 8 RCRA metals) (EPA 1311/6010/6020/7470) (Quickest Possible TAT)		
65	Metals (Priority Pollutant (PP-13)) (EPA 200.7/200.8/245.1/6010/6020/7471)		
66	Volatiles (Total Volatile Organics) (EPA 5035/8240 or 8260)		
67	Volatiles (Halogenated Volatile Organics) (EPA 5030, 5035/8021)		
68	Volatiles (BTEX + MTBE) (EPA 5035/8260)		
69	Volatiles (BTEX) (EPA 5035/8260)		
70	Semi-volatiles (Total Semi-volatiles) (EPA 3540, 3541, 3550/8270)		
71	Semi-volatiles (PAHs) (EPA 3540, 3541, 3550/8270)		
72	Semi-volatiles (PCBs) (EPA 3540, 3541, 3550/8082)		
73	Total Petroleum Hydrocarbons (TQEQ 1006)		
74	Total Petroleum Hydrocarbons (TCEQ 1005)		
75	Total Petroleum Hydrocarbons (one range) (EPA 5030, 5035/8015 GC Scan)		
76	Pesticides (SW-846 8081)		
77	Herbicides (SW-846 8151/8321)		
78	Glycols (SW-846 8015)		
79	Tentatively Identified Compounds		
80	pH		
	Various Analyses		
81	ACM by Polarized Light Microscopy (EPA 600/R-93/116) 24-hour TAT		
82	ACM by Point Count Method (EPA 600/R-93/116) 24-hour TAT		
	TRRP Report		
83	Laboratory Review Checklist		

TABLE 3 – WATER 7 CALENDAR DAY TURNAROUND TIME			
Line Item	**Water Analytical**	Estimated # of Analyses	Special Instruction (hold, etc.)
84	Total Metals (one metal) (EPA 3005, 3015, 3020/6010/6020/7470)		
85	Total Metals (8 RCRA metals) (EPA 3005, 3015, 3020/6010/6020/7470)		
86	Total Metals (Total 30 metals) (EPA 3005, 3015/6010/6020/7470)		
87	Total Metals (Priority Pollutant (PP-13)) (EPA 200.7/6010/6020/7470)		

88	Volatiles (Total Volatile Organics) (EPA 5030/8260)		
89	Volatiles (BTEX + MTBE) (EPA 5030/8021)		
90	Volatiles (BTEX + MTBE) (EPA 8260)		
91	Volatiles (BTEX) (EPA 5030/602/624)		
92	Semi-volatiles (Total Semi-volatiles) (EPA 3510, 3520/8270)		
93	Semi-volatiles (PAHs) (EPA 3510, 3520/8100, 8310/8270)		
94	Semi-volatiles (PCBs) (EPA 3510, 3520/3535/8082, 8141)		
95	Total Petroleum Hydrocarbons (TCEQ 1006)		
96	Total Petroleum Hydrocarbons (TCEQ 1005)		
97	Total Petroleum Hydrocarbons (one range) (EPA 5030, 8015 GC Scan)		
98	Fuel Fingerprint		
99	Pesticides (SW-846 8081)		
100	Herbicides (SW-846 8151/8321)		
101	Glycols (SW-846 8015)		
102	Per- and Polyfluoroalkyl Substances (PFAS) (EPA 1633)		
103	Tentatively Identified Compounds		
104	pH		
105	Conductivity		
106	Total Dissolved Solids		
	Characteristic Tests		
107	Reactivity, Corrosivity, and Ignitibility (RCI)		
108	Total Organic Halogens (TOX, EOX)		
	Various Analyses		
109	Radium Isotopes (EPA 903) – Alpha emitting radioisotopes		
110	Gamma Spectrometry (EPA 901.1)		
111	Carbon 14 (EERF C-01)		
112	Cesium 137 (EPA 901.1)		
113	Oil and Grease (SW-846 9071/1664)		
114	Cyanide (SW-846 9010/9014)		
115	Oil and Grease Extraction (SW-846 9071)		
116	Dioxins/Furans (SW-846 8290/PAM 16130)		
117	Gross Alpha-Beta (EPA 900)		
118	Pesticides (SW-846 8141)		
	TRRP Report		
119	Laboratory Review Checklist		
TABLE 4 – WATER 24-HOUR TURNAROUND TIME			
Line Item	**Water Analytical**	Estimated # of Analyses	Special Instruction (hold, etc.)
120	Total Metals (one metal) (EPA 3005, 3015, 3020/6010/6020/7470)		
121	Total Metals (8 RCRA metals) (EPA 3005, 3015, 3020/6010/6020/7470)		

122	Total Metals (Total 30 metals) (EPA 3005, 3015/6010/6020/7470)		
123	Total Metals (Priority Pollutant (PP-13)) (EPA 200.7/6010/6020/7470)		
124	Volatiles (Total Volatile Organics) (EPA 5030/8260)		
125	Volatiles (BTEX + MTBE) (EPA 5030/8021)		
126	Volatiles (BTEX + MTBE) (EPA 8260)		
127	Volatiles (BTEX) (EPA 5030/602/624)		
128	Semi-volatiles (Total Semi-volatiles) (EPA 3510, 3520/8270)		
129	Semi-volatiles (PAHs) (EPA 3510, 3520/8100, 8310/8270)		
130	Semi-volatiles (PCBs) (EPA 3510, 3520/3535/8082, 8141)		
131	Total Petroleum Hydrocarbons (TCEQ 1006)		
132	Total Petroleum Hydrocarbons (TCEQ 1005)		
133	Total Petroleum Hydrocarbons (one range) (EPA 5030, 8015 GC Scan)		
134	Pesticides (SW-846 8081)		
135	Herbicides (SW-846 8151/8321)		
136	Glycols (SW-846 8015)		
137	Tentatively Identified Compounds		
138	pH		
139	Conductivity		
140	Total Dissolved Solids		
	TRRP Report		
141	Laboratory Review Checklist		
DATA DELIVERABLES			
Line Item	**Deliverable**		
142	Electronic Data Deliverable		
143	CD-R Deliverable (including final analytical report and EDD)		
MISCELLANEOUS ANALYSES			
144			

103 Purchase Order Deliverables

103.1 Description: This Standard Operating Procedure (SOP) identifies the content, form, and procedures required for submittal and acceptance of deliverables from contracted entities, as specified in purchase order specifications administered by ENV.

103.2 Procedures: The following procedures and criteria apply and are applicable for all executed purchase order releases through ENV.

Draft Reports: The Contractor shall submit all Draft Reports or other draft work products (drawings, plans, flow charts, cost estimates, etc.) by e-mail, Box.com or similar file transfer site, or in a format specified in the SOW. The Contractor shall ensure all Draft Reports are technically complete and free of typos and grammatical errors.

Mid Project Deliverables: All mid-project deliverables (Health and Safety Plan, Daily Reports, or other mid project deliverables as outlined in the project statement of work) shall follow the purchase order specification and the detailed requirements outlined in the project specific Statement of Work (SOW), if required. A Mid-Project Deliverable is required for any mid-project invoicing and shall include all work performed within the invoicing period.

Contractor Final Deliverable Packet (CFDP): The contractors shall submit to TxDOT a Final Deliverable Packet in a single PDF Format with all deliverables related to that Purchase Order by e-mail, Box.com or similar file transfer site, or in a format specified in the SOW. This is considered the Final Deliverable Packet and may be separate from individual deliverables required by the release.

Regulatory Derived Deliverables: The Contractor shall prepare the Regulatory Derived Deliverable(s) (e.g. PST program report forms, TRRP report forms, asbestos notification forms, etc.) in accordance with the most current format specified by the regulatory agency. In addition, the Contractor shall follow the general procedures outlined above for the different deliverables. Once approved by TxDOT, the Contractor shall prepare the final regulatory copies with the required information and original signatures, seals and/or licensing proofs and submit it to the ENV Project Manager for countersignature. The Contractor shall submit the Regulatory Derived Deliverable(s) to the appropriate regulatory agency, unless otherwise directed by the SOW.

104 Purchase Order Invoicing

104.1 Description: The following procedures outline the requirements to accept purchase order invoices from contracted entities for payment, for purchase order releases administered by ENV.

104.2 Forms: The Contractor shall submit all forms required by the specification, and as requested by ENV.

104.3 Procedures: The Contractor shall follow the blanket purchase order specification with regard to invoicing and payment requirements. Billed amounts (line-by-line) cannot exceed those authorized in the relevant blanket purchase order release.

Lodging /Hotel and Meals: The Contractor shall only submit Itemized hotel invoices and meal receipts (credit card receipts are not acceptable) to document usage and actual expenses. Reimbursement is further limited by GSA rates in the specified work location at the time of service. Gratuities/tips, non-food items, tobacco, alcohol and alcohol related taxes are not reimbursable.

ENV ITEM 105
Version 4.0

105 Hazardous Materials NEPA Documentation

105.1 Description: The Contractor shall utilize the following procedures when preparing the Hazardous Materials section of a National Environmental Policy Act (NEPA) document for ENV.

Note: For NEPA document preparation, the term Hazardous Materials is a generic term used for all types of contamination and solid waste issues.

105.2 Procedures:
Environmental Assessment – The Contractor shall perform a Single Parcel Phase I Environmental Site Assessment (ESA) per ENV ITEM 120, or a TxDOT Initial Site Assessment (ISA) per ENV ITEM 121, and per the relevant statement of work (SOW).

Hazardous Materials Section – The Contractor shall prepare the Hazardous Materials Section of the NEPA document using the following procedures, or as directed by the SOW.

- A concise summary of relevant information gathered during the ESA or ISA, including sufficient information to show that the study area for the transportation activity was adequately investigated for known or potential recognized environmental conditions.
- A concise description of the scope of the hazardous materials ESA or ISA, and disclosure of any limitations of the assessment.
- A concise summary of the findings of the assessment for each project alternative considered.
- A discussion of any commitments to perform further investigation for suspect areas, and/or justification for postponement of further investigation.
- Disclosure of known or suspected hazardous material contamination that is anticipated to be encountered during construction.
- A discussion of any required special considerations, contingencies or provisions to handle known or suspected hazardous material contamination during right-of-way negotiation and acquisition, property management, design and/or construction.
- A summary of any early coordination or consultation with the regulatory agencies, local entities or property owners; and
- A discussion of any further hazardous materials related coordination with, and approvals or permits required from, the regulatory agencies or other entities.

105.3 Deliverable: The Contractor shall prepare and deliver the Hazardous Materials Section for the NEPA document in a Microsoft Word format, or other specified format outlined within the SOW.

The Contractor shall submit a summary report of the work performed under this ITEM for review and acceptance by TxDOT ENV following the procedures outlined in ENV ITEM 100. The summary report shall include, when applicable, full regulatory database search reports, copies of agency file information, recommendations, a completed TxDOT ISA Report, and any other supporting information.

106 Purchase Order Daily Reports

106.1 Description: This Standard Operating Procedure (SOP) identifies content, form, and procedures required for submittal and acceptance of Daily Field Reports from contracted entities, as specified in purchase order specifications administered by ENV.

106.2 Procedures: In addition to the requirements outlined in the purchase order specification for Daily Field Reports, the Contractor shall include the following information where applicable.

106.2.1 General:

- Generally limited to one page (not including photographs).
- Provided in a consistent format throughout the project.
- Separate from a Field Logbook (per ENV ITEM 138), if applicable.
- The file name for electronic daily report shall include abbreviated job name, the text “Daily Field Report”, and the date.
- Include Photograph of key activities and attach (as a separate file) to the Daily Field Report.
- The Daily Field Report, and attachments, shall be in PDF format and submitted to the ENV Project Manager daily for review and signature.

106.2.2 Format:

- Project name as specified in the purchase order release
- Purchase order release number(s), date, including day of the week
- Sequential Daily Field Reports
- Location information: address or nearest cross street, city, and county
- Contractor name
- General weather conditions
- Temperature and wind direction
- List of personnel onsite and company or agency affiliation
- List of equipment and additional materials onsite
- Traffic control requirements, if applicable
- Underground utility notes/issues/clearance

106.3.1 Work Performed:

- Tailgate and Health and Safety meeting and attendees
- Narrative of specific work tasks performed including start and stop times
- Verify Schedule
- Cost drawdown summary, when requested
- Field screening observations, if applicable
- Summaries of verbal communication concerning cost and schedule

- Status of investigation-derived wastes, if applicable
- Summarize planned activities for the next workday

106.3.2 Soil/Water Sampling: The Contractor shall provide the following information in the Daily Field Report and attachments, as appropriate.

- Sample number(s), location description (site sketch) and purpose
- Type of media (soil, groundwater, etc.)
- Type of analyses requested
- Field observations/sample description
- Sample shipment destination, attach Chain-of-Custody copy, if practical

106.3.3 Soil/Groundwater Removal Activities: The Contractor shall provide the following information, as appropriate, in the Daily Field Report.

- Type of media (soil, groundwater, etc.)
- Approximate cubic yards/gallons of soil/groundwater removed during the day and cumulative volumes
- Approximate cubic yards of backfill delivered and cumulative volumes, if applicable
- A list of the manifest numbers

106.3.4 Tank Removal Activities: The Contractor shall provide the following information, as appropriate, in the Daily Field Report.

- Number, condition, contents, and approximate size of tanks
- Tank inerting/cleaning activities including % Lower Explosive Limit (LEL)
- Approximate volume of fluids managed
- Approximate cubic yards of backfill delivered, description of surface completion
- Management of waste, tank, and/or soil materials

120 Single Parcel Phase I ESA

120.1 Description: This Standard Operating Procedure (SOP) identifies procedures for conducting an Environmental Site Assessment (ESA) on a single parcel of property for the purposes of property acquisition, or as directed by the SOW.

120.2 Procedures: The Contractor shall conduct the Phase I ESA in accordance with ASTM (American Society for Testing and Materials) E1527 (current version), *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*.

120.3 Reporting/ Deliverables: TxDOT shall review the Status Reports and Final Deliverables per ENV ITEM 100. The Final Report (Deliverable) will follow the report format outlined in ASTM E1527 (current version).

121 Initial Site Assessment (ISA)

121.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for conducting an Initial Site Assessment (ISA).

Note: The Hazardous Materials Initial Site Assessment (ISA) is a screening and data collection form used for the purposes of identifying potential contamination issues related to TxDOT right-of-way (ROW). The ISA consists of a desktop study and visual site survey. The ISA is generally based on the ASTM Phase I ESA E1527 (current version) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. Data evaluation is not required beyond what is specifically requested in the form. Analysis and documentation of the collected data shall be included in the Hazardous Materials Project Impact Evaluation, to be scoped separately.

An ISA Job Aid and Statement of Work for Hazardous Materials Processes Related to NEPA are provided on the Hazardous Materials Toolkit to assist in preparation of the ISA as well as the Hazardous Materials Project Impact Evaluation.

121.2 Procedures:
121.2.1 TxDOT shall supply the relevant information concerning the alignment of the project and the requirements related to the physical construction activities such as design schematics and schematic profiles, PS&E plan & profiles, and cross sections when available.

Note: The Contractor shall pay attention to property acquisitions and proposed substantial excavations while completing the ISA.

121.2.2 The Contractor shall obtain and complete the most current ISA Report Form from the Hazardous Materials Toolkit located on the TxDOT internet site.

121.3 Reporting:
TxDOT shall review the Status Reports and Final Deliverables per ENV ITEM 100.

121.4 Reference: The Contractor may utilize the following references in performing the ISA.

- Hazardous Materials Toolkit
- Chapter 2 – Section 2 – Hazardous Materials in Project Development.
- Job Aid: Hazardous Materials Initial Site Assessment (ISA)
- Statement of Work for Hazardous Materials Processes Related to NEPA

122 Geophysical Surveys

122.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for performing a non-intrusive survey to identify anomalous subsurface features.

122.2 Procedures: The Contractor shall use ground-penetrating radar and/or related electromagnetic instrumentation, as appropriate for the site, to identify subsurface anomalies and/or structures.

The Contractor shall conduct geophysical surveys according to established procedures and guidance, to include the following if applicable:

- USACE, EM1110-1-1802 (1995), Geophysical Exploration for Engineering and Environmental Investigation.
- ASTM D6429 (current version), Standard Guide for Selecting Surface Geophysical Methods.
- ASTM D6431 (current version), Standard Guide for Using the Direct Current Resistivity Method for Subsurface Site Characterization.
- ASTM D6432 (current version) Standard Guide for Using the Surface Ground Penetrating Radar Method for Subsurface Investigation.

122.3 Reporting/Deliverables: The Contractor shall submit reports and final deliverables for review and acceptance by TxDOT following the procedures outlined in ENV ITEM 100.

The geophysical final report shall include the following information:

- A description of equipment including type, manufacture, and model used to conduct the survey.
- Equipment calibration frequencies, procedures and results.
- Map(s) illustrating ground penetrating radar and/or geomagnetic/ conductivity data.
- Interpretive text providing a clear and concise summary of survey results.
- Interpretive map(s) locating identified anomalies and/or structures relative to surface features and a determination as to what the anomaly may be (e.g. underground storage tank).
- Estimation of the depth below ground surface of the anomaly; and
- Tabulation of GPS coordinates for all subsurface anomalies.

123 Hazardous Materials Project Impact Evaluation Report

123.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for performing and creating a Hazardous Materials Project Impact Evaluation Report.

Note: The Hazardous Materials Project Impact Evaluation Report is utilized to analyze and document hazardous materials issues that may affect a TxDOT project, as identified in the Hazardous Materials Initial Site Assessment (ISA) Report or a Phase I Environmental Site Assessment (ESA). The Hazardous Materials Project Impact Evaluation may be prepared in conjunction with a project ISA or prepared as a secondary report utilizing a completed project ISA.

123.2 Procedures: The Contractor shall obtain the completed project ISA Report prepared in accordance with ENV ITEM 121 and associated guidance, or Phase I ESA prepared in accordance with ENV 120. Additionally, the Contractor shall obtain the proposed project requirements, which may include project design schematics and PS&E plan-profiles.

123.2.1 Hazardous Materials Project Impact Evaluation: The Contractor shall review the concerns identified in Section 8.1 of the ISA, or the Recognized Environmental Conditions (RECs) identified in the Phase I ESA, and the requirements of the proposed project (design schematics and PS&E plan-profiles) to determine any potential hazardous materials issues to the project.

The Contractor shall evaluate each potential hazardous material issue against the proposed project requirements and determine the likelihood of impact. The Contractor shall include the reason and/or thought process used to make an impact determination. The evaluation shall place each hazardous materials issue within one of the following categories:

- Low Potential or No Potential for Project Impacts (green), with rationale.
- Possible Project Impacts (yellow) – Additional project/construction information or more information related to the contamination is needed.
- Impacts Anticipated (red) – Contamination impacts are expected on the project.

Hazardous Materials Project Impact Evaluation Parameters: The report shall conform to the following parameters:

- The Contractor shall include a summary of the ISA Section 8.1 issues or Phase I ESA RECs (detailed backup information will remain with the ISA or the Phase I ESA report and will not be included in the impact evaluation report).
- The Contractor shall only include the Concerns Identified in Section 8.1 of the ISA that are selected as “Yes”, or the RECs determined to have possible project

impacts that will require an impact evaluation. All Concerns marked as “No” in the ISA, or RECs that are determined not to be an issue in the ESA will not need to be included in the report.

- The Contractor shall evaluate each concern requiring an impact evaluation in a brief written form (e.g. two (2) paragraphs). The Contractor may utilize a tabular format, maps, or cross-sections, when appropriate.

123.3 Reporting: The Contractor shall submit deliverables for review and acceptance by TxDOT ENV using the procedures outlined in ENV ITEM 100.

123.4 Reference: The Contractor may utilize the following references in performing the Hazardous Materials Project Impact Evaluation.

- ASTM E1527 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (current version)
- TxDOT Hazardous Materials in Project Development Manual and Statement of Work for Hazardous Materials Processes Related to NEPA.

130 Utility Clearance for Investigation or Excavation Activities

130.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for performing utility clearances prior to conducting intrusive investigations or excavation activities.

130.2 Procedures: The Contractor shall follow the requirements outlined in Utilities Code Title 5 Chapter 251 Underground Facility Damage Prevention and Safety Act. The Contractor shall identify all utility lines (above and below ground) using reasonable and responsible measures for avoiding impacts to utility lines during intrusive investigations (i.e. drilling, hand auguring, etc.) and excavation operations.

The Contractor shall notify a Notification Center for utility clearance at least 48 hours, but no more than 14 days prior to commencing drilling or excavating activities.

In addition, the Contractor shall verify the existence of all suspected utilities not otherwise identified by the Notification Center (utilities located on private property and those not subscribed to the service). At a minimum, the Contractor shall investigate electrical cables, oil and gas pipelines, water pipelines, communication lines, fiber optic lines, and sanitary sewers. For signal control cables, traffic cameras cables, etc., contact the TxDOT District Traffic Operations.

The Contractor shall document in the Field Notebook the One Call notification, reference number information, and notations about field observations.

131 Temporary Traffic Control Plans

131.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for developing Temporary Traffic Control plans.

Note: The primary function of Temporary Traffic Control (TTC) Plans is to provide for the reasonably safe and efficient movement of road users through or around temporary traffic control zones while reasonably protecting workers, responders to traffic incidents, and equipment.

131.2 Procedures: In preparing the TTC Plan, the Contractor shall follow the requirements outlined in the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD) and TxDOT Traffic Control Plan (TCP) Standards. The Contractor shall use the Traffic Engineering Standard Plan Sheets appropriate for the work being performed.

The Contractor shall prepare the TTC Plan with persons knowledgeable about the fundamental principles of developing a TTC and the project work activities. The Contractor shall use engineering judgment in the design, selection, and placement of TTC devices for a TTC Plan.

The TTC Plan may include provisions for coordination with other entities, such as local officials having jurisdiction over adjacent or cross-streets, law enforcement and other emergency units, utilities, and schools to reduce unexpected and unusual roadway delays.

Prior to implementation of a TTC Plan, the TxDOT District Area Office where the work activities are being performed or another responsible highway official having jurisdiction of the roadway shall approve the plan. Typically, the approval authority is the TxDOT Area Engineer.

131.3 Reporting/ Deliverables: The Contractor shall submit the TTC Plan in writing and conform to the requirements of the TMUTCD and the TxDOT TCP Standards. The degree of detail in the TTC Plan shall depend on the nature and complexity of the situation. A TTC Plan may reference typical drawings contained in the TMUTCD, include standard approved TxDOT drawings and manuals, or contain specific drawings prepared for the specific project. The TxDOT Area Office shall specify if preparation of a TTC Plan is required in the project SOW.

132 Health and Safety Plans

132.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for developing Health and Safety Plans (HASPs).

132.2 Procedures: The Contractor shall perform the following procedures when developing HASPs for areas potentially impacted by contamination.

HASP Development – The Contractor shall identify all safety aspects of site operations prior to commencing fieldwork. The site-specific HASP will include a site characterization and job hazard analysis that includes all reasonably anticipated chemical, physical, and/or biological hazards. The HASP may include a site description, scope of fieldwork, site control measures (access, work zones, security), PPE requirements, emergency response plan, clear chemical monitoring thresholds for stop-work conditions, training requirements for the HASP, and project team organization and responsibilities. TxDOT will not formally review and/or approve the HASP but may require submission of the HASP prior to commencement of field actions as part of the project documentation.

HAZWOPER – At a minimum, the Contractor shall develop the HASP following OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard 29 CFR 1910.120. The HASP shall include documentation showing that all workers (contractors and subcontractors) conducting site activities have completed the training requirements and medical monitoring under OSHA standard 29 CFR 1910.120.

HASP Implementation – Prior to beginning field work, the Contractor shall make the HASP available to all TxDOT employees, contractors, and/or subcontractors present at the project site performing activities listed in the HASP or working within the designated area(s) addressed by the HASP. All such individuals shall sign the HASP, indicating they have reviewed the HASP and understand it. Any subsequent visitors to the site that enter a work zone designated in the HASP shall review and sign the HASP. The Contractor shall modify the HASP as needed.

134 Global Positioning System (GPS) Feature Locating

134.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for utilizing GPS locating.

Note: GPS feature locating techniques are used to measure and record locations of site surface features and/or structures based upon receiving radio signals from a network of orbiting satellites or utilizing commercial coordinate-based maps to interpret location coordinates.

134.2 Procedures: The Contractor shall identify the latitude and longitude of target features identified in the Statement-of-Work (SOW). The Contractor may obtain the latitude and longitude of target features by utilizing internet-based coordinate maps (e.g., Google Earth) and/or using hand-held mobile devices in the field. The Contractor shall obtain coordinates to an accuracy of +/-15 feet for target features.

134.3 Deliverable: The Contractor shall document the latitude and longitude of the target features in the final deliverable.

135 Storage Locations

135.1 Description: Describes the process and procedures required for storing project-related equipment, materials, products, and wastes/ recyclable materials between work shifts.

135.2 Procedures: The following are procedures and/or processes that shall be utilized when storing project-related equipment, materials, products, and wastes/recyclable materials associated with ENV projects.

- Contractor shall secure all permissions required to build and maintain the required storage locations (with assistance from ENV). Only TxDOT managed land shall be utilized for storage locations. *Special permissions and other requirements may be required for storage locations not owned or operated by TxDOT.*
- Contractor shall be responsible for any erosion and sedimentation controls that may be required.
- All equipment shall be stored in a manner that will not impact the public or the environment.
- All work materials and products shall be stored per manufacturer requirements and in a manner compatible with the storage environment. This includes the storage of all fuel and other toxic or hazardous materials.
- Wastes/ recyclable materials shall be stored in a manner that will not contaminate or aggravate the storage location or surrounding environment.
- After all equipment, materials, products, and wastes/recyclables are removed from the storage location, the area affected shall be returned to its pre-storage condition or to the condition agreed to by the permission authority.

135.3 Reporting: Storage locations shall be recorded in the field logbooks, including the before- and after-storage conditions, and documentation included within the project deliverable(s).

137 Decontamination of Environmental Media Sampling Equipment

137.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for decontaminating environmental media sampling equipment.

137.2 Procedures: The Contractor shall utilize the following procedures for the decontamination of sampling equipment for site investigation activities associated with ENV projects. TxDOT may detail the method and equipment required for proper decontamination in the Statement of Work (SOW).

Decontamination Methods: The Contractor shall determine the appropriate decontamination method based on available project site data. The Contractor shall gain prior approval to use solvents, other than water.

Testing for Decontamination Effectiveness: The Contractor shall determine the effectiveness of the decontamination procedures and identify any issues related to discoloration, staining, corrosive effects, visible dirt, sheen, or odor, etc. on the decontamination equipment. The Contractor shall collect appropriate rinsate/wipe samples at the rate specified in accordance with applicable regulatory standards, or as directed in the SOW.

Decontamination Waste Storage and Disposal: The Contractor shall minimize the length of time decontamination waste is staged at the location of origin. TxDOT maintenance facilities may be a preferable staging location instead of the right-of-way contingent on approval. The contractor shall dispose or recycle, at an authorized disposal or recycling facility, all decontaminated wash water, sediment, and/or sludge accumulated during the decontamination process, disposable cleaning equipment, and disposable personal protective equipment. The Contractor may add decontamination liquids to soil cuttings prior to characterizing the soil cuttings for disposal or recycling. The resulting mixture shall pass the paint test for a solid waste.

138 Field Logbook

138.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for recording data and information in a field logbook for TxDOT ENV projects. Field logbooks may contain detailed records of all field activities, summaries of verbal communications, observations of site conditions, and any deviations from the Statement of Work (SOW).

138.2 Materials:

- Field Logbook – bound (not loose-leaf) book with a water-resistant cover and numbered pages.
- Indelible ink pen.

138.3 Procedures: The Contractor shall use the following information as guidelines.

138.3.1 General:

- Each project requires a separate logbook (i.e. Work Authorization or Master Blanket Purchase Order Release).
- Record all pertinent field activities in the logbook (dark enough to photocopy).
- Multiple logbooks for a project require numbering (i.e. 1 of 3, 2 of 3, etc.).
- Each new day's entries will begin on a new page.
- Fill each page for a specific day completely prior to beginning a new page. Do not skip pages unless necessary for legibility. If a page must be skipped, draw a diagonal line through the entire page (initial and date) to prevent unauthorized entries. Partially filled pages shall have a diagonal line drawn across the blank portion of the page (initial and date).
- Draw a line through any blank pages, if unused.
- Do not remove any pages from the logbook.
- Draw a single line through any entries to be corrected, initial, and date the correction.
- Only record factual and relevant information.

138.3.2 Format:

Record the following on the cover of the logbook:

- Project Name as assigned by the ENV Project Manager.
- Work Authorization or Master Blanket Purchase Order Release number.
- Beginning and ending dates of activities recorded in the logbook.
- Company (Contractor) name.

Record the following information on the first page of the field logbook:

- Contractor's Project Manager's name and contact information.

- Names and contact information for all field personnel who witness or record entries in the logbook.

Daily Logbook Entries: The Contractor shall record the following information at the beginning of each day in the field and throughout the field day.

- Date including day of the week. Note: the year date notation for the 2020-decade should include the four-digit year (e.g. 2020, or 2024, etc.)
- Starting time.
- General weather conditions.
- Specific location.
- Personnel onsite including company affiliation.
- Equipment used and calibration results.
- Work tasks and location(s) where performed, including start and stop times.
- Scaled drawings of sampling locations, as appropriate.
- Description of photographs taken including a unique, sequential identifier (e.g., 1, 2, 3, 4…n).
- Sample collection information (See 138.3.3).
- Verbal communication summaries and changes in SOW (initialed by individuals authorizing any changes preferred).
- The recording personnel's initials after the last entry on each page.
- The recording personnel's dated signature following the last entry of each day.
- A diagonal line across any blank space remaining on a page following the last daily entry.
- Note any Health and Safety issues.
- Tailgate meeting time and attendance.
- IDW log noting container type, contents, and quality.
- Underground utility notes/issues/clearances.

138.3.3 Sample Collection: The Contractor shall enter the following information, as appropriate, when collecting samples.

- Sample location description
- Sampler's name
- Collection time (Military)
- Type of media (soil, groundwater, etc.)
- Designation of sample (composite, grab, etc.)
- Sample specific measurement data/instrument readings (pH, temperature, conductivity, odor, color, etc.)
- Field observations/sample description
- Unique sample ID designation

139 Investigation-Derived Waste (IDW) Handling and Management

139.1 Description: The following procedures detail the proper handling and disposal of commonly generated investigation-derived wastes (IDW) produced as a result of ENV projects.

139.2 Procedures: Unless otherwise directed by the Statement of Work (SOW), the Contractor shall use the following procedures when handling, characterizing, transporting, and disposing or recycling of IDW associated with ENV projects.

IDW Staging, Containment and Labeling – When generating IDW on a project, the Contractor shall temporarily stage/containerize/store it onsite or in an area designated by the SOW. The Contractor shall minimize the length of time containerized decontamination waste is staged at the location of origin. TxDOT maintenance facilities may be a preferable staging location to the right-of-way contingent on approval. The Contractor shall take proper safety precautions to ensure the safety of the workers and the public.

The Contractor shall utilize one of the following methods to temporarily store IDW at the project location, unless otherwise directed by the SOW.

Solids

- **Plastic sheeting** – The Contractor shall place plastic sheeting below and cover the IDW with plastic sheeting to prevent the material from contaminating the media below and to prevent surface water erosion and infiltration of the IDW. When necessary, the Contractor shall secure the plastic cover in a manner to prevent removal by wind and penetration by rainwater and utilize containment berms and/or diversion berms to prevent surface water contact with the IDW.
- **55-gallon drums/Roll-off containers** – Drums and containers used during the investigation(s) shall meet the appropriate U.S. Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA), and U.S. Environmental Protection Agency (EPA) regulations, as applicable, for the wastes they contain. The Contractor shall use covered drums and roll-off containers to prevent wind-blown dusts and rainwater infiltration. The Contractor shall utilize liners if required by the transport or disposal contractor. Additionally, the Contractor shall place drums on pallets whenever possible.

Semi-Solids and Liquids

- **55-gallon drums/frac tanks/tanks** – Drums/frac tanks/tanks used during the investigation(s) shall meet the appropriate U.S. Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA), and EPA regulations, as applicable, for the wastes they contain. The Contractor shall cover and seal each container for a secure transport and to ensure each is free of leaks.

The Contractor shall label each container as containing non-hazardous IDW, pending the results of the laboratory characterization. The Contractor shall place the label in a visible location and include, at a minimum, the following, unless directed by the SOW:

- "Non-Hazardous" designation
- Name of generator(s)
- Date generated
- Site address
- Contact person and phone number
- Type of material contained (water, soil, etc.)
- Use weather resistant labels with indelible ink.

IDW Sampling and Characterization – The Contractor shall evaluate the analytical data collected for the project and the requirements of the waste depository to determine whether the previously collected data is representative, sufficient, and acceptable for characterization purposes. If previously collected analytical data is not acceptable or sufficient, prior to transportation and disposal, samples of the IDW shall be collected and submitted for laboratory analyses in accordance with applicable state and federal regulations. The Contractor shall determine the appropriate number of samples to collect, and the applicable analytical tests required by the landfill, recycling center, and/or disposal site. The Contractor shall determine the waste classification, disposal/recycling methods, and any additional labeling and manifesting requirements prior to shipment. The Contractor shall include a copy of the analytical report in the project deliverable(s) unless directed otherwise by the ENV PM.

IDW Storage, Manifesting, and Disposal or Recycling – The Contractor shall ensure the proper storage, manifesting, transport, and disposal or recycling of the IDW. This shall include managing all manifests, permits, and licenses requirements.

Reporting – The Contractor shall submit deliverables for review and acceptance by TxDOT using the procedures outlined in ENV ITEM 100.

The Contractor must include copies of the field logbook, analytical testing results, and waste characterization/ waste manifest forms within the project deliverable(s).

150 Soil Borings and Sample Collection

150.1 Description: The following procedures detail the requirement for the proper drilling of soil borings and soil sample collection, handling, and custody procedures for ENV projects.

150.2 Licensing/Training Requirements: The Contractor shall ensure a Texas-licensed Professional Geoscientist supervises all drilling and soil sampling programs. A Texas Licensed Water Well Driller, with experience in performing environmental work, shall drill all soil borings, with the exception of hand auger borings.

150.3 Procedures: The Contractor shall use the following procedures when drilling soil borings and collecting soil samples associated with ENV projects. The Professional Geoscientist shall consider geologic conditions at the site as well as the project objectives when deciding on the appropriate drilling and soil sampling methods.

Soil Borings – The Contractor shall use direct-push methods (hydraulically and hammer-operated rams) and hollow-stem drilling methods, when appropriate. When site conditions do not permit the use of these methods, the Contractor will use other drilling methods. The Professional Geoscientist shall determine the appropriate drilling method used on a project-specific basis (pre-approved by the ENV Project Manager). The introduction of any fluids into the borehole to enhance drilling efforts require pre-approval by the ENV Project Manager. The Contractor shall have drilling locations pre-approved by the ENV Project Manager. Any adjustments to the drilling and sampling methods or locations require pre-approval by the ENV Project Manager, as well.

The Contractor shall decontaminate all associated drilling and sampling equipment to remove all oil, grease, mud, etc., prior to mobilizing to the site. Equipment with porous surfaces such as rope, wood, etc. cannot be thoroughly cleaned and shall not be reused. The Contractor shall only handle cleaned equipment with clean gloves, including new nitrile gloves, new clean cotton gloves, etc., as appropriate.

The Contractor shall inspect soil boring locations for underground and above-ground utilities prior to drilling.

The Contractor shall complete boring logs for each soil boring location. The Contractor shall include the following information on the boring log:

- Project Name
- Drilling Company Name
- Driller Name
- Consulting Company Name
- Boring ID
- Borehole Diameter
- Total Depth of Boring
- Soil Sample Depths

- Logger Name
- Drilling Start/Completion Dates
- Drilling Method
- Soil Sampling Method
- Lithologic Description
- Soil Screening Results
- Encountered and Static Depth to Water
- Borehole Plugging Method
- Boring Location (GPS Coordinates and references to common site landmarks)
- Brief Weather Description

Soil Sample Collection – Typical soil sampling methods include split-spoon samplers, Shelby tubes, and grab samples. The Professional Geoscientist shall determine the appropriate sampling methods and equipment used on a project-specific basis.

Sampling personnel shall don a clean pair of gloves at the onset of sampling activities and at each new sampling interval to prevent cross-contamination. Sampling personnel must keep their hands as clean as practical and replace gloves when soiled while performing sampling activities.

The Contractor shall collect soil samples with pre-cleaned sampling equipment appropriate for the type of samples collected.

The Contractor shall collect a discrete portion of the collected sample for the purposes of laboratory testing for chemical parameters. The Contractor will not homogenize samples for VOC analysis because of volatilization during soil mixing. The Contractor will use the remaining sample volume for headspace screening, physical description of soil characteristics, and laboratory samples for testing of physical properties.

- **Soil Sample Screening** – Soil screening methods shall include visual and olfactory observations made by a qualified environmental professional. The Contractor shall use properly calibrated Photoionization Detectors (PID) and/or Flame Ionization Detectors (FID) with the manufacturer's recommendations for calibration for the type of contaminates expected at the project. The instruments require field calibration according to manufacturer's recommendations.

  Using a self-sealing polyethylene freezer bag, field personnel shall half-fill the bag with the collected soil sample so that the volume ratio of soil to air is equal, then they shall immediately seal the bag. The Contractor shall then manually break down the sample into smaller soil clumps within the bag.

  The Contractor shall develop the headspace for at least 10 minutes. After development, the Contractor shall shake the bag vigorously for 15 seconds.

  The Contractor shall introduce the instrument sampling probe into a small opening in the bag to a point about one-half of the headspace depth. The Contractor shall record the highest detector response.

- **Soil Sample Handling** – The Contractor shall place in pre-cleaned laboratory-supplied containers all samples collected for chemical analyses. The type and size of the containers and preservation methods used for soil samples varies based on the type of analyses performed. The Contractor may collect Quality Assurance/Quality Control (QA/QC) samples on ENV projects. The project SOW shall specify the type and collection schedule for QA/QC samples.

  The Contractor shall complete sample labels at the time of sample collection, to include the following information:

  - Project name
  - Unique sample ID number and depth
  - Sample collection date and time
  - Initials of person collecting sample
  - Preservation method

  The Contractor shall initiate in the field and at the time of sampling a chain-of-custody record. One shall accompany each set of samples shipped to any laboratory. Each time responsibility for custody of the sample's changes, the new and previous custodians must sign the record and note the date and time. The Contractor shall submit the final signed chain-of-custody document with the analytical results in the report for the sampling event. The Contractor shall use indelible ink on the chain-of-custody form.

  The Contractor shall use the following parameters when using a secured area for temporary storage:
  - Record the time, date, and location of the secured area in the "relinquished by" space of the custody form.
  - Record the time an individual regains custody in the "received by" space of the custody form.

  The Contractor shall use the following parameters when shipping samples:
  - The person sealing the shipping container shall enter the time and date and sign the chain-of-custody form.
  - Enclose the original chain-of-custody form in the shipping container and retain a copy for the project manager's file.
  - Retain from the shipper a post office receipt, bill of lading, or similar document as part of the permanent chain-of-custody documentation.
  - Affix one or more custody seals over the opening of the shipping container in a manner that precludes opening the container without breaking the seal(s).
  - Inscribe the container seal(s) with the signature of the person sealing the container and the date and time sealed.
  - The Contractor shall properly package and send the samples to the analytical laboratory. The Contractor is responsible for any lost coolers,

exceedance of handling and holding times, broken sample containers, mislabeled or missing sample containers and/or chain-of-custody forms, and improperly preserved samples.

Borehole Plugging – The Contractor shall properly plug and abandon boreholes in accordance with ENV ITEM 210.

Reporting – The Contractor shall record soil boring activities in the field logbooks (ENV ITEM 138) and/or on company boring log forms.

170 Temporary Monitoring Well Installation

170.1 Description: The following procedures detail the requirements for the proper installation of temporary groundwater monitoring wells.

Note: Temporary monitoring wells are designed and installed to create temporary access for the collection of groundwater samples to assess groundwater quality and the hydrogeologic properties of the aquifer in which contaminants may exist.

The Contractor shall consider hydrogeologic conditions at the site as well as the project objectives when deciding whether a temporary sampling point is appropriate and on the appropriate temporary monitoring well installation method. Typical drilling methods include hollow-stem auger, water rotary, air rotary, dual rotary, sonic, and direct-push equipment.

170.2 Licensing/Training Requirements: A Texas-Licensed Professional Geoscientist or a Professional Engineer in compliance with the Geoscientist Practice Act, Texas Occupations Code, Chapter 1002, shall plan and supervise all drilling and temporary monitoring well installation programs. A drilling contractor (Licensed Water Well Driller) licensed in the State of Texas and experienced in performing environmental investigation work shall install temporary monitoring wells. All personnel involved in the fieldwork must complete the training requirements and medical monitoring under OSHA standard CFR 1910.120.

170.3 Equipment and References: The Contractor shall supply all equipment and tools required to drill and install temporary monitoring wells, to include but not limited to the following.

- Well-logging forms.
- Water level meter or other measuring apparatus for verifying well and hole depths, water levels, and equipment dimensions.
- Appropriate level of Personal Protective Equipment (hard hat, steel-toed boots, hearing and eye protection, etc.); refer to applicable OSHA and U.S. EPA guidance documents.
- Contaminant-detection equipment appropriate with information derived during the project planning stage and in the site safety plan.
- Sample collection containers, plastic resealable bags (quart and gallon sizes), or other containers, as appropriate.
- Trowels, knives, hammers, chisels, as appropriate; and
- Description aids (Munsell color charts, grain size charts, etc.) as appropriate.

170.4 Procedures: The Contractor shall utilize the following procedures when installing temporary monitoring wells on TxDOT ENV projects.

170.4.1 Planning: The planning, selection, and implementation of any temporary monitoring well installation program shall include the following:

- Review of existing data on site geology and hydrogeology, including publications and existing maps.
- Assessment of the site to determine potential access issues, utility's locations, water supply sources, decontamination location, and equipment storage areas.
- Performance of utilities location notifications in accordance with ENV ITEM 130.
- Development of a traffic control plan, as necessary, in accordance with ENV ITEM 131.
- Preparation of a site-specific health and safety plan in accordance with ENV ITEM 132.
- Final selection of drilling, sampling, and development methods and well installation location.
- Determination of temporary well construction specifications (casing and screen materials, diameter, length, screened interval, slot size, etc.); and,
- Determination of drill cuttings, development fluid, and purge water handling, storage, and disposal methods.

170.4.2 Field Preparation: The Contractor shall decontaminate all associated equipment prior to mobilization to remove oil, grease, mud, etc. To minimize the risk of cross-contamination, the Contractor shall decontaminate all downhole equipment, including well screen and casing. Do not reuse equipment with porous surfaces such as rope, wood, etc.

The Contractor shall not handle cleaned equipment with soiled gloves and shall use new Nitrile gloves, new clean cotton gloves, etc., as appropriate. The Contractor shall remove all manufacturers paint from drilling tools and other downhole equipment to prevent the introduction of contaminants.

170.4.3 Field Data Recording and Logging: The Contractor shall record on the Boring/Well Log Form the lithologic description, field measurements, and any associated comments. The Boring/Well Log shall include the following, at a minimum:

- Name and location (address) of the site.
- Boring/Well ID.
- Drilling company and driller name.
- Consulting company and logger name.
- Description of the well location.
- Start/Completion dates.
- Log of geologic formations (and description thereof) plus any geophysical logs collected.
- Temporary well depth.
- Depth to water (e.g. top of saturation and static).
- Diameter and total depth of the drill hole and methods of sampling and drilling.
- Length, depth, construction material/type, and size of the casing and screen.
- The location of the top and bottom of the screen.

- The screen slot or perforation size.
- Type and placement depths of temporary filter pack, if utilized; and,
- GPS location of each well.

170.4.4 Well Construction: The Contractor shall not screen and case temporary monitoring wells in locations that will introduce contaminants into groundwater. Do not join any of the well materials with glues or other adhesives. Construct temporary wells to meet the project objectives. Determine screen placement based on the project objectives and actual field conditions.

Generally, the well screen will intersect the uppermost surface of the groundwater table with sufficient open screen area above the groundwater interface to allow for the detection of light non-aqueous phase liquids or contaminants with a specific gravity less than water. When applicable, the well screen shall intersect the bottom of the saturated interval for detection of dense non-aqueous phase liquids or contaminants with a specific gravity greater than water.

The Contractor shall use a filter pack when samples are not reasonably free of turbidity.

170.4.5 Development: The Contractor shall develop the temporary monitoring wells following installation. This may entail surging, jetting, pumping, or any other method that will remove material which will pass through the screen openings or casing perforations. Development shall continue until the water is clear and reasonably free of silt and sand. Temporary wells constructed of prepacked well screen may not require development if the water produced is clear and reasonably free of silt and sand. If water was introduced into the borehole during drilling, at least five times as much water as was added to the borehole during the drilling process must be removed during the development of the well. Samples collected from the temporary monitor well that will be submitted to the contract laboratory for metals analyses shall have a turbidity < 5 NTUs.

The Contractor shall keep a Well Development Log detailing all aspects of the well development process. The Contractor shall record in the field logbook, or on a separate development log, the development method employed, volume of water removed, visual observations, turbidity, estimated drawdown and recovery rates, etc.

171 Monitoring Well Installation

171.1 Description: The following procedures detail the requirements for the proper installation of permanent groundwater monitoring wells.

Note: Monitoring wells are designed and installed to create a permanent access for the collection of groundwater samples to assess groundwater quality and the hydrogeologic properties of the aquifer in which contaminants may exist.

The Contractor shall consider hydrogeologic conditions at the site as well as the project objectives when deciding on the appropriate monitoring well installation method. Typical drilling methods include hollow-stem auger, water rotary, air rotary, dual rotary, sonic, and direct-push equipment.

171.2 Licensing/Training Requirements: A Texas-Licensed Professional Geoscientist or a Professional Engineer in compliance with the Geoscientist Practice Act, Texas Occupations Code, Chapter 1002, shall plan and supervise all drilling and monitoring well installation programs. A drilling contractor (Licensed Water Well Driller) licensed in the State of Texas and experienced in performing environmental investigation work shall install monitoring wells. All personnel involved in the fieldwork must complete the training requirements and medical monitoring under OSHA standard CFR 1910.120.

171.3 Equipment and References: The Contractor shall supply all equipment and tools required to drill and install monitoring wells, to include but not limited to the following.

- Well-logging forms.
- Water level meter or other measuring apparatus for verifying well and hole depths, water levels, and equipment dimensions.
- Appropriate level of Personal Protective Equipment (hard hat, steel-toed boots, hearing and eye protection, etc.); refer to applicable OSHA and U.S. EPA guidance documents.
- Contaminant-detection equipment appropriate with information derived during the project planning stage and in the site safety plan.
- Sample collection containers, plastic resealable bags (quart and gallon sizes), or other containers, as appropriate.
- Trowels, knives, hammers, chisels, as appropriate; and,
- Description aids (Munsell color charts, grain size charts, etc.) as appropriate.

171.4 Procedures: The Contractor shall utilize the following procedures when installing monitoring wells on TxDOT ENV projects.

171.4.1 Planning: The planning, selection and implementation of any monitoring well installation program shall include the following:

- Review of existing data on site geology and hydrogeology, including publications and existing maps.
- Assessment of the site to determine potential access issues, utility's locations, water supply sources, decontamination location, and equipment storage areas.
- Performance of utilities location notifications in accordance with ENV ITEM 130.
- Development of a traffic control plan, as necessary, in accordance with ENV ITEM 131.
- Preparation of a site-specific health and safety plan in accordance with ENV ITEM 132.
- Final selection of drilling, sampling, and development methods and well installation location.
- Determination of well construction specifications (casing and screen materials, diameter, length, screened interval, slot size, filter pack specifications, final completion method, etc.); and,
- Determination of drill cuttings, development fluid, and purge water handling, storage, and disposal methods.

171.4.2 Field Preparation: The Contractor shall decontaminate all associated equipment prior to mobilization to remove oil, grease, mud, etc. To minimize the risk of cross-contamination, the Contractor shall decontaminate all downhole equipment, including well screen and casing. Do not reuse equipment with porous surfaces such as rope, wood, etc.

The Contractor shall not handle cleaned equipment with soiled gloves and will use new Nitrile gloves, new clean cotton gloves, etc., as appropriate. The Contractor shall remove all manufacturers paint from drilling tools and other downhole equipment to prevent the introduction of contaminants.

171.4.3 Field Data Recording and Logging: The Contractor shall record on the Boring/Well Log Form the lithologic description, field measurements, and any associated comments. The Boring/Well Log shall include the following, at a minimum:

- Name and locations (address) of the site.
- Boring/Well ID.
- Drilling company and driller name.
- Consulting company and logger name.
- Description of the well location.
- Start/Completion date.
- Log of geologic formations (and description thereof) plus any geophysical logs collected.
- Well, depth;
- Depth to water (e.g. top of saturation and static).
- Diameter and total depth of the drill hole and methods of sampling and drilling.
- Length, depth, construction material/type, and size of the surface/conductor casing or well casing and screen.

- Changes in size of the surface/conductor casing or well casing and type of casing.
- The amount, type, and location of grout used in the hole.
- The location and type of packers or centralizers used in the hole, if any.
- The location of the top and bottom of the screen.
- The screen slot or perforation size.
- Type and placement depths of filter pack.
- Wellhead surface completion information and length of raised monument stickup, if any.
- Top of casing survey and site datum information; and,
- GPS location of each well.

171.4.4 Well Construction: The Contractor shall not screen and case monitoring wells in locations that will introduce contaminants into groundwater. Do not join any of the well materials with glues or other adhesives. Construct monitoring wells to meet the project objectives. Determine screen placement based on the project objectives and actual field conditions.

Generally, the well screen will intersect the uppermost surface of the groundwater table with sufficient open screen area above the groundwater interface to allow for the detection of light non-aqueous phase liquids or contaminants with a specific gravity less than water. When applicable, the well screen shall intersect the bottom of the saturated interval for detection of dense non-aqueous phase liquids or contaminants with a specific gravity greater than water.

The Contractor shall use a filter pack when samples are not reasonably free of turbidity.

171.4.4.1 Bedrock Wells: The Contractor shall use air or water rotary, dual rotary, or sonic drilling methods, unless otherwise stated in the SOW.

Note: When using air rotary methods, the compressed air supply must be filtered to remove entrained oil or other contaminants prior to introduction into the borehole. Bedrock wells may be completed as an open-hole (i.e. no long-string casing) provided borehole caving or heaving is not an issue. If the open borehole is subject to caving, the well must be completed as a cased, sand-packed well (see 171.4.4.2). Open-hole wells shall meet surface completion requirements.

171.4.4.2 Unconsolidated Sediment Wells: The Contractor may use any of the drilling methods discussed in this SOP to install monitoring wells in unconsolidated sediments (overburden).

Note: Hollow-stem auger methods are generally preferred for shallow (< 100 feet) unconsolidated sediment wells because the well can be constructed inside of the augers.

171.4.4.3 Construction:

Note: Monitoring well casing and screen must be of sufficient diameter to achieve the purposes of the well. Normal sampling operations typically require casing which has an inside diameter greater than or equal to 2 inches, though some well-monitoring apparatus or uses may require much larger casing. Additional considerations are drilling method used, well depth (strength requirements), well development requirements (additional development-water disposal), pre-sampling well purging volumes (additional purge-water disposal), rate of recovery, and costs.

The Contractor must determine the screen slot size and length and must meet the project objectives, or as specified by the SOW. Additionally, the Contractor must install well screen centralizers at sufficient intervals to center the screen in the borehole, as needed. Additional centralizers may be necessary to ensure that the casing remains centered in the borehole.

The Contractor shall fill the annular space between the well screen and the borehole with a sand pack to serve as a filter media. The sand pack must be clean, chemically inert, and composed primarily of quartz sand. The Contractor must determine the size and gradation of the sand pack to meet the project objectives and to reduce the volume of fine sediment entering the well.

Note: For wells deeper than approximately 50 feet, or when required to prevent “bridging” of the sand pack materials, the sand pack must be emplaced using a tremie pipe. The sand pack must be emplaced to a level approximately one to three feet above the top of the screened interval, with allowance for some settling after placement.

The Contractor must install an annular transition seal on top of the sand pack to prevent the migration of contaminants to the sampling zone from the surface or intermediate zones.

Note: The seal materials should be chemically inert, so they do not affect the quality of the groundwater samples. Typically, an annular transition seal consisting of a minimum of two to three feet of coarse-granular or pelletized bentonite, or a bentonite slurry, is appropriate for most monitoring wells. This annular transition seal will prevent the grout from infiltrating the sand pack and the well screen. If required, a small quantity of distilled water may be added to expand the bentonite transition seal prior to installation of the grout. The type of seal, the depth interval, and the amount of seal materials used will be noted in the field notes.

The Contractor must place a cement or cement/bentonite grout from the top of the annular transition seal to the ground surface. The following mixes are acceptable:

- Neat cement: Type I or Type II Portland cement mixed with a maximum of 6 gallons of water per 94-pound bag of cement.
- Cement-Bentonite: 5 pounds of pure bentonite per 94-pound bag of cement with 7 to 8 gallons of water.

- Cement-Bentonite: 6 to 8 pounds of pure bentonite per 94-pound bag of cement with 8 to 10 gallons of water, if water mixed.

Note: If water is present in the borehole above the annular transition seal, the grout must be emplaced through a tremie pipe until undiluted grout flows from the annulus at the ground surface. If no water is present in the borehole, the grout may be surface poured using care to not bridge the grout or scour the annular transition seal. After curing for 24 hours, any depression at the surface due to settlement must be refilled with similar grout.

The Contractor shall install a surface seal, wellhead protection, and tamper-resistant well cap to protect the integrity of the monitoring well and the samples collected. The Contractor may use an alternative completion if approved by ENV on a case-by-case basis.

Note: Typically, the surface seal and well protection should consist of a concrete apron, completed slightly above grade and sloped away from the center of the borehole to divert surface runoff, set with a traffic-rated, weather-tight, flush-mount monitoring well vault.

The Contractor shall secure the well cap with a lock.

Note: For multiple monitoring well investigations, all locks must be keyed alike.

The Contractor must visibly notch a permanent benchmark location on the top of the well casing as a point of reference for all depth measurements, by industry standard the North side of the casing.

171.4.4.4 Development: The Contractor shall develop the monitoring wells following installation.

Note: Wells must be thoroughly developed by surging, jetting, or any other method which will remove material which will pass through the screen openings or casing perforations. Development shall continue until the water is clear and reasonably free of silt and sand. Wells constructed of prepacked well screen may not require development if the water produced is clear and reasonably free of silt and sand. If water was introduced into the borehole during drilling, at least five times as much water as was added to the borehole during the drilling process must be removed during the development of the well. Samples collected from the monitor well that will be submitted to the contract laboratory for metals analyses shall have a turbidity < 5 NTUs.

The Contractor shall keep a Well Development Log detailing all aspects of the well development process. The Contractor shall record in the field logbook, or on a separate development log, the development method employed, volume of water removed, visual observations, turbidity, estimated drawdown and recovery rates, etc.

171.5 Permits/Reporting Requirements: The Contractor shall properly file all required permits, Water Well Reports, etc., with the appropriate regulatory agencies.

178 Groundwater Monitoring and Sampling

178.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for monitoring static fluid levels and sample collection, handling, and custody for TxDOT ENV projects.

178.2 Procedures: The Contractor shall utilize the following procedures when conducting groundwater monitoring and sampling activities associated with ENV projects. The Contractor shall consider hydrogeologic conditions at the site as well as the project objectives when deciding on the appropriate groundwater monitoring and sampling methods taking into account previous sampling methods.

Note: When monitoring wells are equipped with vapor-tight, watertight caps, the caps should be removed approximately 30 to 60 minutes before depth to water measurements are taken to allow equilibration with atmospheric pressure and stabilization of groundwater elevation.

The Contractor shall monitor the air above the wellhead with a photo-ionization detector/flame ionization detector (PID/FID) to determine the potential for fire, explosion, and/or toxic effects on workers. The Contractor shall record the condition of the monitoring well casing, annular seal, concrete pad, and steel protective casing in the Field Logbook.

Note: The device used to measure fluid levels in a monitoring well shall be sufficiently sensitive so that a measurement to $\pm$0.01 feet can be readily obtained. The field measurements will include depth to standing water, immiscible layer(s) (DNAPL/LNAPL), if present, and total depth inside the well casing. The measurements shall be taken from a permanent, easily identified and replicable reference point on the top of the monitoring well casing, by industry standard, usually the north side of casing.

The Contractor shall put on a clean pair of gloves at the onset of the monitoring activities and at each new monitoring well to prevent cross-contamination. Personnel shall keep their hands as clean as practical and replace gloves when necessary.

The Contractor shall decontaminate the groundwater monitoring equipment between uses at each monitoring well.

Groundwater Sample Collection

Note: Low-flow groundwater purging and sampling is the preferred method for use on TxDOT ENV projects in any well that can be pumped at a constant rate of 1.0 L/min or less without drawdown of the water level in the well.

The Contractor shall conduct all Low-Flow purging and sampling procedures in accordance with ASTM D6771 (current version), *Standard Practice for Low-Flow Purging and Sampling Used for Groundwater Monitoring*.

The Contractor may use alternative sampling methods on a project-specific basis as agreed upon by the ENV Project Manager and Contractor, or as described in the Statement of Work.

The Contractor shall collect groundwater samples with a pre-cleaned, inert (e.g. fluorocarbon or stainless steel, etc.) sampling equipment appropriate for the type of samples being collected.

Note: During the collection of groundwater samples, a clean and dry sheet of plastic will be placed on the ground surface in the sample handling area. If materials used in the sampling process must be put down, they will be placed on a clean portion of the plastic sheet instead of the ground surface.

Sampling should occur in a progression from the least to the most contaminated well, if known. The Contractor will not sample monitoring wells that contain immiscible layers, unless otherwise agreed upon by the Contractor and the ENV Project Manager.

Sample Handling – Place all samples collected for chemical analyses in pre-cleaned laboratory supplied containers. The type and size of containers and preservation methods used for groundwater samples varies based on the type of analyses performed. The Contractor shall select the appropriate sample containers and preservation methods in accordance with applicable U.S. Environmental Protection Agency (EPA)/TCEQ standards.

The Contractor shall complete sample labels at the time of sample collection and will use the following information.

- Project name
- Unique sample ID number
- Sample collection date and time
- Initials of person collecting sample
- Preservation method

Sample Custody – The Contractor shall use the following parameters when shipping samples:

- The person sealing the shipping container shall enter the time and date and sign the chain-of-custody form.
- Enclose the original chain-of-custody form in the shipping container and retain a copy for the project manager's file.
- Retain from the shipper a post office receipt, bill of lading, or similar document as part of the permanent chain-of-custody documentation.

- Affix one or more custody seals over the opening of the shipping container in a manner that precludes opening the container without breaking the seal(s).
- Inscribe the container seal(s) with the signature of the person sealing the container and the date and time sealed.
- The Contractor shall properly package and send the samples to the analytical laboratory. The Contractor is responsible for any lost coolers, exceedance of handling and holding times, broken sample containers, mislabeled or missing sample containers and/or chain-of-custody forms, and improperly preserved samples.

Reporting – The Contractor shall supply copies of the logbooks and/or monitoring and sampling forms in the final reports submitted to ENV.

185 Aquifer Testing

185.1 Description: This Standard Operating Procedure (SOP) identifies the procedures required for performing aquifer testing.

185.2 Procedures: The Contractor shall determine the type of aquifer tests required to meet project objectives in coordination with the TxDOT Project Manager.

185.2.1 Step-Drawdown Test: The Contractor shall use a step-drawdown test prior to conducting a constant-rate aquifer test. The step-drawdown test will employ several different discharge rates with each subsequent flow rate greater than the prior flow rate. The Contractor will determine the step discharge rates and duration of the steps based on knowledge of the aquifer characteristics and field measurements obtained during the test.

185.2.2 Constant-Rate Test: The Contractor shall use a constant-rate test for a minimum duration of 8 hours followed by well recovery monitoring immediately after the pump has been shut-off. The Contractor shall determine the actual length of the constant-rate test based on field measurements.

Note: The optimum discharge rate is determined by the step-drawdown test, unless otherwise directed by the SOW.

The Contractor shall monitor to identify any naturally occurring short-term static water level fluctuations influenced by pumping prior to conducting step-drawdown and constant-rate tests by measuring water levels in observation wells.

Note: All water level measurements should be recorded to the nearest 0.01 foot. Water level monitoring equipment will not be changed during a test.

The Contractor shall determine the length of pre-test monitoring based on knowledge of local and regional aquifer characteristics, active water wells in the area, and/or nearby water bodies. The Contractor shall record the barometric pressure readings during the pre-test monitoring and throughout the constant-rate and recovery testing periods.

185.2.3 Slug Tests: The Contractor shall conduct slug tests on a minimum of three (3) wells at a project site.

Note: Slug test results can be useful for demonstrating groundwater is not of potential beneficial use (yields of less than 150 gallons per day), however, slug test results alone should not be used for designing remediation systems.

185.3 Reporting: The Contractor shall prepare all Draft and Final Aquifer Test Reports (Deliverables) per regulatory agency specifications.

189 Mold Assessments

189.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for performing mold assessments for TxDOT ENV projects.

189.2 Qualifications: The Contractor shall conduct mold assessment(s) by individuals licensed by the Texas Department of Licensing and Regulation (TDLR), regulated by the Texas Mold Assessment and Remediation Rules (TMARR).

189.3 Procedures: The Contractor shall perform mold assessment (visual hygiene assessment) of the indoor environment for identification and quantification of fungal growth. Additionally, the Contractor shall evaluate the moisture content of internal building materials, measure temperature and relative humidity, and collect tape samples for the analysis of potential fungal growth.

189.4 Mold Laboratory: The Contractor shall collect bulk surface and air samples and have them analyzed by a TDLR-licensed mold analysis laboratory.

189.5 Reporting: The Contractor shall submit reports and final deliverables for review and acceptance by TxDOT following the procedures outlined in ENV ITEM 100.

190 Asbestos Inspections

190.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for performing asbestos inspections for TxDOT ENV projects.

190.2 Qualifications: The Contractor shall conduct asbestos inspections by an accredited asbestos inspector as identified by the U.S. Environmental Protection Agency (EPA) and a Licensed Asbestos Inspector by the Texas Department of State Health Services (TDSHS).

190.3 Planning: The Contractor shall include the following in the planning and preparation of performing bridge asbestos inspections:

- Review existing bridge information provided to them to assess bridge locations and accessibility.
- Determine if there are issues that would prevent access to a bridge or its components such as vegetation or debris under the bridge, saturated or uneven ground, high span bridge, high traffic roadways, etc.
- Develop a traffic control plan, as necessary, in accordance with ENV ITEM 131.
- Determine if any special equipment will be required to access the bridge and bridge components (ex: boom lifts, snoopers, boats, etc.).

190.4 Procedures: The Contractor shall use the following procedures when performing Asbestos Inspections for ENV, unless otherwise outlined by the Statement of Work (SOW).

Sampling:

- Asbestos Containing Material (ACM) Inspections shall be conducted in general accordance with the Asbestos Hazard Emergency Response Act (AHERA) 40 CFR 763.86 Sampling and the Texas Asbestos Health Protection Rules (TAHPR) (25 TAC Part 1, Chapter 296),
- The Contractor shall take samples only from homogenous areas suspected to contain ACM and proposed for renovation or demolition,
- Assess each homogenous area for potential friability,
- Take a minimum of three bulk samples from each homogenous area,
- For bridge or other structure inspections, collect samples from behind barriers or beneath structures when possible. Use TxDOT bridge and bridge class culvert component terminology for identifying and describing sample locations. Should the inspection require sample collection in areas not protected from traffic, contact the ENV Project Manager regarding implementation of temporary traffic control measures.

Analysis:

- Analyze each bulk sample for the visual estimated presence of asbestiform minerals utilizing Polarized Light Microscopy (PLM) coupled with dispersion staining (EPA Method 600/R-93/116).
- Analyze by 400 Point Count (EPA 600/R-93/116) if the visual estimated PLM analysis shows the asbestiform minerals are 1% or above, but less than 5% (NESHAPS identifies 10% for this threshold but TxDOT uses 5%, due to the unlikelihood that point count will overturn a PLM sample between 5-10%).

190.5 Asbestos Laboratory: The Contractor shall analyze samples by a laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) and licensed by the TDSHS as an asbestos laboratory.

190.6 Reporting: The Contractor shall submit deliverables for review and acceptance by TxDOT following the procedures outlined in ENV ITEM 100. In addition, the Asbestos Inspection Report will include the following.

- A summary of the inspection performed,
- A description of who performed the inspection and associated Licenses,
- A description of each defined homogeneous areas,
- Attachments will include:
    - Copies of current TDSHS Asbestos Consultant Agency License and TDSHS Asbestos Inspector License,
    - Sample log,
    - Table of Identified ACM including description, NESHAP Category, location and estimated amount,
    - Structure diagram and photographs showing the sample locations, and
    - Copy of laboratory analysis with chain of custody.
- Sample Log will include the following:
    - Sample ID#,
    - Location Sample Collected,
    - For TxDOT bridges, include Bridge NBI#,
    - Material description,
    - Analytical methods,
    - Asbestos % found,
    - Approximate amount of ACM (square footage, cubic feet, linear feet, number of elements, etc.),
    - Visual friability of ACM,
    - Results of laboratory analysis, and
    - Supporting information.

191 Asbestos Abatement Plans

191.1 Description: The procedures governing the creation of Asbestos Abatement Plans/ Specifications (AAP) for the removal of Asbestos Containing Materials (ACM) by a State of Texas licensed Asbestos Abatement Contractor.

191.2 Qualifications: The Contractor shall prepare AAP by a State of Texas licensed Asbestos Consultant (25 TAC Part 1, Chapter 296.59).

191.3 Procedures: At a minimum, the AAP shall comply with the Asbestos NESHAP for Demolition and Renovation (40 CFR 61.145), OSHA asbestos standard (29 CFR 1926.1101), and applicable provisions of the Texas Asbestos Health Protection Rules (25 TAC Part 1, Chapter 296).

The Contractor shall include the following in the AAP:

- **Structure Description:** The Contractor shall give a brief description of the previously surveyed structure along with the details of the ACM for removal. The description, at a minimum, will reference and attach an Asbestos Survey. The AAP shall clearly identify the type, condition, and location of the ACM.
- **Regulatory Overview:** A brief reference to the rules and regulations utilized for the creation of the AAP.
- **Abatement Contractor Qualifications:** The AAP shall outline the regulatory licensing and qualifications required to perform the abatement procedures.
- **Regulatory Notifications Requirements:** All notifications required to perform the abatement.
- **Asbestos Abatement Procedures:** The Contractor shall investigate options to abate the ACM from the structure, considering time and cost. The Contractor shall specify, in a clear and direct manner, the preferred solution along with the methods to perform the abatement.
- **Decontamination:** The AAP shall detail the procedures to decontaminate personnel and equipment used in the abatement.
- **Clearance:** If required, the AAP shall detail the procedures for third party clearance requirements.

192 ACM Abatement – Bridges/Outdoor Structures

192.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for planning and executing TxDOT Asbestos Containing Materials (ACM) abatement projects for bridges or outdoor structures.

Note: This SOP should not be used for asbestos abatement in Public Buildings as regulated under the Texas Asbestos Health Protection Rule (TAHPR), 25 TAC Part 1, Chapter 296, Subchapter K.

192.2 Procedures: The Contractor shall remove ACM from highway bridges/structures at locations specified in the Statement of Work (SOW), in accordance with the following procedures:

- Work Plan: Ensure that the final SOW addresses the following elements, as applicable:
  - Removal Procedures – describe materials, controls, and work practices used in removing and containing ACM.
  - Removal Verification Procedures – describe procedures for verifying and documenting removal of ACM.
  - Employee Qualifications/Training.
  - Project work schedule.
- Provide required regulatory notifications for ACM abatement work.
- Remove ACM from the structures in accordance with all applicable regulatory requirements, including 40 CFR 61.145 (Standard for Demolition and Renovation – Asbestos NESHAP) and 29 CFR 1926.1101 (Safety and Health Regulations for Construction, Toxic and Hazardous Substances - Asbestos OSHA).
- Do not grind, abrade, or otherwise disturb the ACM in a manner that would cause an asbestos hazard or visible fiber release.
- Properly classify, contain, transport, and dispose of the removed ACM in accordance with State and Federal regulations.
- Restore site to near original condition by removing all materials, equipment, and debris upon completion of ACM removal activities.
- Abatement Daily Reports: The Contractor shall supply the following material in addition to the Daily Reports identified in ENV ITEM 106.
  - A description of materials, controls, and work practices used to remove the ACM,
  - Quantity of ACM removed,
  - Results of the removal work, including a statement confirming completion of all removal activities, and/or a description and explanation for any ACM that could not be removed, and
  - Photographic documentation illustrating removal of the ACM.

192.3 Reporting: Submit project deliverables as specified in ENV ITEM 103, Purchase Order Deliverables and in accordance with the Contract requirements.

193 ACM Abatement – Building Demolition

193.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for the abatement of Asbestos Containing Materials (ACM) to facilitate the demolition/renovation of a public building in accordance with the Texas Asbestos Health Protection Rules (TAHPR), 25 TAC, Chapter 296, Subchapter K.

193.2 Procedures: The Contractor shall remove ACM from the building(s) in accordance with the asbestos project specification. Maintain compliance with TAHPR and all other applicable regulatory requirements including:

- Licensing: Maintain compliance with Texas Department of State Health Services (TDSHS) asbestos abatement contractor licensure requirements.
- Notification: Provide notification prior to abatement work in accordance with TDSHS asbestos notification procedures.
- Waste Handling and Disposal: Store, transport, and dispose of asbestos waste materials in accordance with regulatory requirements.
- Record Keeping: Maintain project records and documents as required.

193.3 Reporting: The Contractor shall submit project deliverables as specified in ENV ITEM 103, Purchase Order Deliverables and in accordance with the Contract requirements.

194 ACM Abatement – Building Renovation

194.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for the abatement of Asbestos Containing Materials (ACM) to facilitate the renovation of a public building in accordance with the Texas Asbestos Health Protection Rules (TAHPR), 25 TAC, Chapter 296, and Subchapter K.

194.2 Procedures: The Contractor shall remove ACM from the building(s) in accordance with the asbestos project specification. Maintain compliance with TAHPR and all other applicable regulatory requirements including:

- Licensing: Maintain compliance with Texas Department of State Health Services (TDSHS) asbestos abatement contractor licensure requirements.
- Notification: Provide notification prior to abatement work in accordance with TDSHS asbestos notification procedures.
- Waste Handling and Disposal: Store, transport, and dispose of asbestos waste materials in accordance with regulatory requirements.
- Record Keeping: Maintain project records and documents as required.

194.3 Reporting: The Contractor shall submit project deliverables as specified in ENV ITEM 103, Purchase Order Deliverables and in accordance with the Contract requirements.

195 Lead-Containing Paint (LCP) Inspections

195.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for Lead-Containing Paint (LCP) Inspections.

195.2 Planning: The Contractor shall include the following in the planning and preparation of performing bridge lead-containing paint inspections:

- Review existing bridge information provided to them to assess bridge locations and accessibility.
- Determine if there are issues that would prevent access to a bridge or its components such as vegetation or debris under the bridge, saturated or uneven ground, high span bridge, high traffic roadways, etc.
- Develop a traffic control plan, as necessary, in accordance with ENV ITEM 131.
- Determine if any special equipment will be required to access the bridge and bridge components (ex: boom lifts, snoopers, boats, etc.).

195.3 Procedures: The Contractor shall utilize the following procedures when performing lead-containing paint inspections for ENV, unless otherwise outlined by the Statement of Work (SOW).

Sampling:

- Perform visual inspections to determine suspect painted (or coated) surfaces, which may contain lead, only in areas being disturbed by the project.
- Take bulk samples only from suspect homogenous paint (or coatings) locations, or as outlined by the SOW. For bridge structures, samples shall be taken only from painted metal surfaces.
- Assess each homogenous paint (or coating) for color, texture, condition, and location.
- Take one sample from each identified homogenous paint (or coating) location. The Contractor will take enough paint (or coating) to provide adequate material for analysis.
- For bridge or other structure inspections, collect samples from behind barriers or beneath structures when possible. Use TxDOT bridge and bridge class culvert component terminology for identifying and describing sample locations.

Analysis:

- Analyze each bulk sample for the presence of lead utilizing U.S. Environmental Protection Agency (EPA) Method 3050/6010, or as directed by the SOW.

195.4 Laboratory: The Contractor shall ensure that a lab accredited by the Environmental Lead Laboratory Accreditation Program (ELLAP) performs the analysis.

195.5 Reporting: The Lead-in Paint Inspector shall prepare all reports (Deliverables) per ENV ITEM 100. In addition, the Lead-Containing Paint Inspection Report will include the following.

- A summary of the inspection performed,
- Description of each identified homogeneous area suspect to have lead-containing paint (or coatings), to include the following characteristics:
    - Color,
    - Texture,
    - Condition,
    - Location, and
    - Area (square feet) of LCP
- Results: The Contractor shall report the results in part-per-million (ppm) and not in percentages.
- Attachments shall include:
    - Sample log,
    - Table of identified LCP including description, location, and estimated amount,
    - Structure diagram and photographs showing the sample locations, and
    - Copy of laboratory analysis with chain of custody.
- Sample Log will include the following:
    - Sample ID#,
    - Location sample collected,
    - For TxDOT bridges, include Bridge NBI#,
    - Material description,
    - Analytical methods,
    - Approximate amount of LCP (square footage, number of elements, etc.),
    - Condition,
    - Results of laboratory analysis, and
    - Supporting information.

196 Lead-Containing Paint (LCP) Strip Abatement

196.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for planning and executing TxDOT lead-containing paint (LCP) strip abatement projects.

Note: The procedures are intended for projects where torch cutting, heating, welding or grinding must be performed on metals coated with LCP. Metal components covered by this procedure include, but are not limited to, guardrails, guardrail posts, bridge beams/girders, diaphragms, bearing attachments/shoes, and bolt heads.

196.2 Procedures: The Contractor shall perform LCP strip abatement from highway bridges/structures specified in the Statement of Work (SOW) and at the locations provided by the TxDOT District Point-of-Contact (POC) for the project, or at locations denoted by marking paint placed on the structure by the Bridge/Demolition Contractor. The Contractor and either the TxDOT District POC or the Bridge/Demolition Contractor may meet at the structure to confirm the cut locations to prepare the work plan and cost estimate and/or prior to the initiation of the abatement.

The Contractor shall ensure that the final Scope of Work addresses the following:

- Description of materials, controls, and work practices used in removing LCP
- Description of procedures for verifying and documenting removal of LCP
- Employee Qualifications
- Project Work Schedule

The Contractor shall provide all personnel, materials, and equipment necessary (man lifts, scaffolding, ladders, stripper, etc.) to accomplish the abatement.

196.2.1 Removal Method: The Contractor shall perform the LCP strip abatement using wet removal methods by a combination of mechanical equipment and manual scraping. If needed, the Contractor may clean the surface using abrasive scrub pads and/or nylon brushes. The Contractor shall clearly note in the Contractor's assumptions in the SOW any weather-related or other limitations of the wet removal method.

For bridge beams/girders, the Contractor shall abate a 12-inch-wide strip of LCP around the perimeter of the beams/girders, centered on the agreed-upon location, or as determined by the TxDOT District POC or the Bridge/Demolition Contractor. For other, smaller components (diaphragms, guardrails, bearings/shoes, etc.), the Contractor shall abate using a 4-inch or 6-inch wide (the width of the strip is based on the size of the component) strip around the perimeter of the component, or as determined by the TxDOT District POC or the Bridge/Demolition Contractor. For components being repaired using heat methods, the size of the area to be abated will be determined based on the size of the area for repair.

196.2.2 Waste Management: The Contractor shall stage in an area designated by the TxDOT District POC all waste materials generated during the LCP abatement. The Contractor shall store all paint removal wastes in approved, secured, and leak-proof containers following completion of each work shift. Upon completion of the LCP project, the Contractor shall properly characterize the waste materials for transportation and disposal at an appropriate disposal facility.

196.3 Reporting: The Contractor shall document the LCP strip abatement, per the Deliverable section of the Statement of Work for the project, and per ENV ITEM 103 – Purchase Order Deliverables.

196.4 References: The Contractor may utilize the following references in performing the LCP strip abatement.

- 2024 TxDOT Standard Specifications, Item 6 Control of Materials, 10.1 – Painted Steel Requirements
- 2024 TxDOT Standard Specifications, Item 446 – Field Cleaning and Painting Steel
- 29 Code of Federal Regulations (CFR) 1926.62 – Lead in Construction
- 29 CFR 1926.354 – Welding, Cutting, and Heating in Way of Preservative Coatings
- 40 CFR 302 – Designation, Reportable Quantities, and Notification
- Occupational Safety and Health Administration (OSHA) Directive STD 03-08-001 – Welding, Cutting, or Heating of Metals Coated with Lead-Bearing Paint

197 Mold Remediation Work Plan

197.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for creating Mold Remediation Work Plan(s) for the removal of identified mold in internal buildings by a State of Texas licensed Mold Remediation Contractor (MRC).

197.2 Qualifications: A Texas Department of Licensing & Regulation (TDLR) Licensed Mold Assessment Consultant (MAC) shall prepare Mold Remediation Work Plans in accordance with the Texas Mold Assessors and Remediation Rules (TMARR) (16 TAC Part 4, Chapter 78).

197.3 Procedures: Mold Remediation Work Plans shall comply with TDLR and TMARR.

197.4 Reporting: The licensed MAC shall prepare the work plan per the Deliverable section of the Statement of Work for the project and per ENV ITEM 100 – Project Deliverables.

198 Lead-Containing Paint (LCP) Abatements – Building Renovation

198.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for planning and executing TxDOT lead-containing paint (LCP) abatement projects.

Note: The procedures are intended for projects where LCP will need to be abated prior to the renovation of a building or structure.

198.2 Procedures: The Contractor shall perform the LCP abatement in accordance with the Statement of Work (SOW) prepared for the abatement project. The Contractor shall follow all applicable regulatory requirements associated with the abatement, including but not limited to Occupational Safety and Health Administration (OSHA) Lead in Construction rules and regulations.

198.3 Waste Management: The Contractor shall stage all waste materials generated per ENV ITEM 135 Storage Locations. The Contractor shall store all paint removal wastes in approved, secured and leak-proof containers following completion of each work shift. Upon completion of the LCP abatement project, the Contractor shall properly characterize the waste materials for transportation and disposal at an appropriate disposal facility.

198.3 Reporting: The Contractor shall document the LCP strip abatement per the Deliverable section of the Statement of Work for the project and per ENV ITEM 103 – Purchase Order Deliverables.

198.4 References: The Contractor may utilize the following references in performing the LCP abatement.

- Occupational Safety and Health Administration (OSHA) Lead in Construction publication (OSHA 3142-12R 2004)
- 29 Code of Federal Regulations (CFR) 1926.62 – Lead

199 Mold Remediation

199.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for remediation of mold to repair or renovate a building in accordance with the Texas Mold Assessors and Remediation Rules (TMARR).

199.2 Procedures: Remove identified mold from building(s) in accordance with the Mold Remediation Work Plan. Maintain compliance with TMARR and all other applicable regulatory requirements including:

- Licensing: Maintain compliance with Texas Department of Licensing and Regulation (TDLR) Mold Remediation Contractor Licensure requirements.
- Notification: Provide notification prior to remediation work in accordance with TDLR mold notification procedures.
- Waste Handling and Disposal: Store, transport, and dispose of remediation waste materials in accordance with regulatory requirements.
- Record Keeping: Maintain project records and documents as required.

199.3 Reporting: The Contractor shall document the mold remediation per the Deliverable section of the Statement of Work for the project and per ENV ITEM 103 – Purchase Order Deliverables.

ENV ITEM 200
Version 4.0

200 Underground Storage Tank (UST) Removal from the Ground

200.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for the permanent removal from service by removal from the ground for underground storage tanks (USTs) and UST systems as defined by 30 TAC, Chapter 334, Subchapter A, §334.2.

200.2 Procedures: The Contractor shall remove the UST(s) or UST system(s) in accordance with the following Texas Commission on Environmental Quality (TCEQ) rules and guidance:

- Permanent Removal from Service by Removal from the Ground for USTs and UST Systems:
    - 30 TAC, Chapter 334, Subchapter C, §334.55(b)
- Construction Notification for USTs and UST Systems:
    - 30 TAC, Chapter 334, Subchapter A, §334.6
- Registration for USTs and UST Systems:
    - 30 TAC, Chapter 334, Subchapter A, §334.7
- UST On-Site Supervisor Licensing and Contractor Registration:
    - 30 TAC, Chapter 334, Subchapter I, §§334.401-424
    - 30 TAC Chapter 30, Subchapter I, §§30.301-319

TCEQ Publications and Forms: The Contractor shall refer to the following guidance documents and use the following forms, as applicable:

- *Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs) (RG-411)*
- *Petroleum Storage Tanks: Am I regulated? (RG-042)*
- *PST Super Guide: A Comprehensive Guide to Compliance in Texas:*
    - *Licensed Underground Storage Tank Contractors* (RG-475c)
    - *Permanently Removing Petroleum Storage Tanks from Service (*RG-475m)

- *Underground Storage Tank Registration and Self-Certification Form (TCEQ-00724)*
- *Underground & Aboveground Storage Tank Construction Notification Form (TCEQ-00495)*
- *Incident Report Form (TCEQ-20097)*
- *Release Determination Report form (TCEQ-00621)*

TxDOT Publication: The contractor shall refer to the following:

Technical Guide: Removal of Underground Storage Tanks (USTs) Encountered During Construction

200.3 Reporting/Deliverables: The final report (deliverable) shall contain the information outlined in TCEQ rules, particularly 30 TAC §334.55(b), and include the TCEQ Release Determination Report form (TCEQ-00621). The Contractor shall prepare the Regulatory Derived Deliverable(s) in accordance with the most current format specified by the regulatory agency, the Deliverable section of the Statement of Work for the project, and ENV ITEM 103 – Purchase Order Deliverables.

201 Aboveground Storage Tank (AST) Removal

201.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for the removal of an aboveground storage tank (AST) and associated piping as defined by 30 TAC, Chapter 334, Subchapter F, §334.122.

Note: This SOP applies to ASTs regulated by 30 TAC Chapter 334, Subchapter A and Subchapter F, which follow the same release reporting, investigation, and corrective action requirements as regulated underground storage tank (UST) facilities for suspected or confirmed releases.

ASTs exempt from the AST program under §334.123(a)(9) and (b) (relating to Exemptions for ASTs), and §334.124(a)(4) (relating to Exclusions for ASTs) may be subject to 30 TAC Chapter 327 (relating to Spill Prevention and Control) when a discharge or spill (as defined by 30 TAC §327.2) has occurred.

201.2 Procedures: Although there are no technical requirements for permanent removal from service for an AST in Texas, many of the procedures required for USTs are applicable, including:

- Comply with any local government permitting requirements.
- Tanks shall be properly emptied, cleaned, and purged of vapors prior to removal in accordance with accepted industry procedures commonly employed for the stored regulated substance.
- All connected piping and other ancillary equipment shall be emptied, disconnected, and properly plugged, capped, or removed.
- Prior to transport for disposal, legibly and permanently label (in letters at least two inches high) the tank with the name of the former contents, a flammability warning (if applicable), and a warning that the tank is unsuitable for the storage of drinking water or the storage of human or animal food products.
- Properly dispose or recycle all waste, tanks, piping, and ancillary equipment. The methods and procedures used for the handling, transporting, and disposing or recycling of removed tanks (and parts of such tanks) shall be protective of human health and safety and the environment, and shall be in accordance with all applicable federal, state, and local regulations.
- Inspect the area for releases from the AST. If a release is suspected, additional investigation will be required.
- Complete an updated AST registration form in accordance with TCEQ requirements.

TCEQ Publications and Forms: The Contractor shall refer to the following guidance documents and use the following forms, as applicable:

- *Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs)* (RG-411)

- *Petroleum Storage Tanks: Am I regulated? (RG-042)*

- *PST Super Guide: A Comprehensive Guide to Compliance in Texas:*

    - *Suspected Releases from Petroleum Storage Tanks* (RG-475h)

    - *Aboveground Petroleum Storage Tank* (RG-475n)

- *Aboveground Storage Tank Registration and Self-Certification Form (TCEQ-00659)*

- *Incident Report Form (TCEQ-20097)*

- *Release Determination Report form (TCEQ-00621)*

201.3 Contractor Licenses and Registrations: The Contractor shall have the appropriate licenses and registrations from the TCEQ to perform the removal and disposal of fuel and fuel residue from an AST system. The transporter and disposer of the fuel and fuel residue shall be registered/ licensed with the TCEQ.

201.4 Reporting/ Deliverables: Submit project deliverables as specified in ENV ITEM 103, Purchase Order Deliverables and in accordance with the SOW and/or Contract requirements. The Final Report shall include:

- Location, number, contents, and size of AST(s)
- Volume of liquids/semi-solids removed, managed, and disposed
- Photographic documentation of field activities, documenting removal of contents of AST(s) and removal of the AST system.
- Updated TCEQ Aboveground Storage Tank Registration and Self-Certification Form (TCEQ-00659).
- For suspected or confirmed releases, complete a TCEQ Release Determination Report form (TCEQ-00621)

201.5 References: The Contractor shall comply with the following TCEQ rules:

- Release Reporting and Corrective Action for Aboveground Storage Tanks (ASTs): 30 TAC 334, Subchapter F, §334.129
- AST Registration Requirements 30 TAC 334, Subchapter F, §334.127

202 Underground Storage Tank (UST) In-Place Closure

202.1 Description: This Standard Operating Procedure (SOP) identifies the requirements to close an underground storage tank (UST) and associated ancillary equipment in place.

202.2 Procedures: The Contractor shall close the UST in-place in accordance with the Texas Commission on Environmental Quality's (TCEQ) regulations found in 30 TAC 334.55 and the following:

- Submit the TCEQ Construction Notification Form (TCEQ-00495) to TCEQ at least 30 days prior to in-place closure.
- Notify TCEQ regional office 24 to 72 hours prior to in-place closure.
- Notify city, county, and fire marshal of plan for in-place closure of USTs.
- Determine location of the USTs, including the proximity to the roadway and need for traffic control.
- Determine if there is a need to relocate or remove objects or structures (canopy, dispensers, building, etc.) to access the USTs.
- Determine configuration of the UST fill, pump drop tubes and overfill prevention.
- Locate aboveground and underground utilities.
- Determine type of product stored and estimate volume of liquids remaining in the USTs.
- Perform waste characterization of UST contents and prepare waste profile forms.
- Contact the waste disposal contractor to identify the analytical testing needed to characterize the waste and the waste profile forms to prepare.
- Coordinate schedule and site access to the USTs.
- Remove liquids/semi-solids from the tank until it is empty.
- Wash the USTs, remove liquids/semi-solids, and purge vapors.
- Remove overburden (i.e., concrete, asphalt, fill material, soil, etc.) to expose the top of the USTs, and stockpile overburden in area designated by the TxDOT representative.
- Cut holes in the top of the exposed USTs.
- Fill USTs with solid inert material free of any harmful contaminants or pollutants. Acceptable materials include sand, fine gravel, sand and gravel mixtures, and cement/concrete-based slurries. Other materials such as native soils, drilling muds, and commercially marketed fill materials shall not be used.
- Cut all fill risers, automatic tank gauging risers, Stage 1 vapor recovery risers, and vent lines flush with the surrounding ground or pavement surface and plug with flowable fill.
- Collect soil samples and assess the UST for a release and submit a PST Release Determination Report form (TCEQ-00621). Sampling methods, types, locations, and number collected to be in accordance with TCEQ RG-411.

- Restore site to original condition by removing all project-related materials, equipment and debris upon completion of field activities related to the in-place closure of the USTs.
- File an amended UST registration within 30 days of in-place closure using the UST Registration and Self-Certification Form (TCEQ-00724).

202.3 Contractor Licenses and Registrations: Contractor must hold a UST contractor registration issued by TCEQ. The individual supervising the removal of a UST must hold a valid on-site supervisor Class "B" license issued by TCEQ. The on-site supervisor must be present at the site at all times during the critical junctures of the closure in-place of the UST(s). The Contractor shall have the appropriate license and registration from the TCEQ to perform the removal and disposal of fuel and fuel residue from a UST system. The transporter and disposer of the fuel and fuel residue shall be registered/ licensed with the TCEQ.

202.4 Final Report: Submit project deliverables as specified in ENV ITEM 103, Purchase Order Deliverables, and in accordance with the SOW and/or Contract requirements. The Final Report shall include:

- Location, number, contents, and size of USTs
- Volume of liquids/semi-solids removed, managed and disposed
- Fully executed waste manifests
- UST vapor readings
- Volume of inert material or flowable fill placed into USTs and risers
- Photographic documentation of field activities, documenting removal of contents of USTs, filling USTs, and capping of fill ports and access ports
- TCEQ Release Determination Report form (TCEQ-00621)

202.5 References: The Contractor shall close the USTs in-place in accordance with the following TCEQ rules and guidance:

- Permanent Removal from Service: 30 TAC Chapter 334, Subchapter C, §334.55(c).
- Registration for Underground Storage Tanks (USTs) and UST Systems: 30 TAC, Chapter 334, Subchapter A, §334.7.
- Construction Notification for Underground Storage Tanks (USTs) and UST Systems: 30 TAC, Chapter 334, Subchapter A, §334.6.
- UST Contractor Registration / Licensing: 30 TAC, Chapter 334, Subchapter I, §334.401, §334.407, §334.424 and Chapter 30, Subchapter I §§30.301-319.

TCEQ Publications and Forms: The Contractor shall refer to the following guidance documents and use the following forms, as applicable:

- *Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs) (RG-411)*
- *Petroleum Storage Tanks: Am I Regulated? (RG-042)*
- *PST Super Guide: A Comprehensive Guide to Compliance in Texas:*

- *Licensed Underground Storage Tank Contractors* (RG-475c)
- *Permanently Removing Petroleum Storage Tanks from Service (*RG-475m)

- *Underground Storage Tank Registration and Self-Certification Form (TCEQ-00724)*
- *Underground & Aboveground Storage Tank Construction Notification Form (TCEQ-00495)*
- *Incident Report Form (TCEQ-20097)*
- *Release Determination Report form (TCEQ-00621)*

203 Underground Storage Tank (UST) Temporary Out of Service

203.1 Description: This Standard Operating Procedure (SOP) identifies the requirements to temporarily take an underground storage tank (UST) out of service.

203.2 Procedures: The Contractor shall take a UST temporarily out of service in accordance with the Texas Commission on Environmental Quality's (TCEQ) regulations found in 30 TAC 334.54 and the following parameters:

- Determine location of the USTs, including the proximity to the roadway and need for traffic control.
- Determine if there is a need to relocate or remove objects or structures (canopy, dispensers, building, etc.) to access the USTs.
- Determine configuration of the UST fill, pump drop tubes, and overfill prevention.
- Locate aboveground and underground utilities.
- Determine type of product stored and estimate of the volume of liquids remaining in the USTs.
- Perform waste characterization of UST contents and prepare waste profile forms.
- Contact the waste disposal contractor to identify the analytical testing needed to characterize the waste and the waste profile forms to prepare.
- Coordinate schedule and site access to the USTs.
- Remove liquids/semi-solids from the tank until it is "empty" by TCEQ definition: any fuel residue (i.e. liquid and sludge) is less than a depth of one inch and does not exceed 0.3 percent by weight of the system at full capacity.
- Contact the ENV Project Manager if a release has occurred.
- File an amended UST registration within 30 days of temporary removal of service using the UST Registration and Self-Certification Form (TCEQ-00724).
- Keep all vent lines open and functioning to prevent vapors building up and potentially causing an explosion.
- Cap, plug, or lock piping, pumps, manways, tank access points (e.g., fill risers, automatic tank gauging risers, Stage 1 vapor recovery risers) and ancillary equipment to prevent access, tampering, or vandalism by unauthorized persons.
- Ensure that corrosion protection is maintained.
- Restore site to original condition by removing all project-related materials, equipment and debris upon completion of field activities related to temporarily removing the USTs from service.

203.3 Contractor Licenses and Registrations: The Contractor shall have appropriate license and registration from the TCEQ to perform the removal and disposal of fuel and fuel residue from a UST system. The transporter and disposer of the fuel and fuel residue shall be registered/ licensed with the TCEQ.

203.4 Final Report: Submit project deliverables as specified in ENV ITEM 103, Purchase Order Deliverables and in accordance with the SOW and/or Contract requirements. The Final Report shall include:

- Location, number, contents, and size of USTs
- Volume of liquids/semi-solids removed, managed and disposed

- Fully executed waste manifests
- Photographic documentation of field activities, documenting removal of contents of USTs and capping of fill ports and access ports.

203.5 References: The Contractor shall take a UST temporarily out of service in accordance with the following TCEQ rules and guidance:

- Temporary Removal from Service for a UST: 30 TAC Chapter 334, Subchapter C, §334.54
- UST Registration Requirements: 30 TAC, Chapter 334, Subchapter A, §334.7

The Contractor shall refer to the following TxDOT guidance documents:

- TxDOT UST Temporary Removal from Service Guidance, December 2014

TCEQ Publications and Forms: The Contractor shall refer to the following guidance documents and use the following forms, as applicable:

- *PST Super Guide: A Comprehensive Guide to Compliance in Texas:*
  - *Temporarily Removing Petroleum Storage Tanks from Service* (RG-475)

- *Petroleum Storage Tanks: Am I regulated? (RG-042)*

- *Underground Storage Tank Registration and Self-Certification Form (TCEQ-00724)*

204 Non-Regulated Underground Tank System Removal

204.1 Description: This Standard Operating Procedure (SOP) identifies the requirements to remove non-regulated underground storage or treatment tanks and ancillary equipment.

Note: In-ground hydraulic lifts that use a compressed air/hydraulic lift system are partially exempt/excluded from regulation under Texas Commission on Environmental Quality (TCEQ) Petroleum Storage Tank regulations found in 30 TAC Chapter 334 but are subject to release reporting and corrective action requirements in 30 TAC Chapter 334, Subchapter D when there is a suspected or confirmed release. For these tanks, the Contractor shall only take confirmation samples during the removal of the tank if there is visual or olfactory evidence of a spill or release (reference ENV ITEM 200).

204.2 Procedures: The Contractor shall access the tank through existing manways or ports or pipes to determine the dimensions of the tank and possible contents and volume. The Contractor shall properly characterize for acceptance at an appropriate recycling or disposal facility any product or waste present in the tank.

The Contractor shall render the tank safe by performing the following tasks.

- Remove, to the extent practicable, the contents of the tank.
- Rinse the residual waste or product until clean (for transport to a recycling or disposal facility).
- Manually demolish cast-in-place tank structures and properly dispose of broken concrete and rebar.
- Excavate and remove metal, or cast-in-place tanks, if specified in the statement of work due to conflicts with proposed construction.
- For excavated tanks, properly transport and properly dispose or recycle the tank.

If during the removal or closure of the tank the Contractor notes any visual or olfactory evidence of a spill or release, confirmation samples shall be collected for laboratory analysis based on the substance that was stored in the tank. The samples shall be submitted to a TxDOT-contracted laboratory for analysis.

204.3 Reporting /Deliverables: The Contractor shall submit the daily reports to the TxDOT ENV Project Manager detailing work completed each day. The daily reports shall meet the requirements detailed in ENV ITEM 106 – Purchase Order Daily Reports.

The final report (deliverable) will be a letter report detailing all the work involved with removing the targeted underground tank(s) and will include characterization analytical results, photos of the removal, a narrative of the work, transportation and disposal manifests, and copies of the signed daily reports. The final deliverable shall meet the requirements detailed in ENV ITEM 103 – Purchase Order Deliverables.

210 Plugging and Abandoning of Groundwater Monitoring Wells

210.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for the plugging and abandoning of monitoring or remediation wells.

210.2 Qualifications: The Contractor shall use an individual holding a water well driller or pump installer license issued by the Texas Department of Licensing and Regulation pursuant to the Texas Occupations Code Title 12 Chapter 1901 and Title 16 TAC 76.21 to plug and abandon monitoring wells.

210.3 Procedures: The Contractor shall plug and abandon all monitoring or remediation wells in accordance with 16 TAC 76.72, and 76.104.

All wells shall be plugged in accordance with the following specifications and in compliance with the local groundwater conservation district rules and local city ordinances:

- All removable casing shall be removed from the well. If the casing cannot be removed, it shall be cut below the ground surface as far as possible.
- Any existing surface completion shall be removed.
- The entire well shall be pressure filled via a tremie pipe with cement from bottom up to the land surface, OR
- The well may be filled with coarse-grade bentonite chips or pellets (3/8 to 3/4 inches) hydrated at frequent intervals while adhering to the manufacturers' recommended rate and method of application; OR
- The well shall be pressure filled via a tremie tube with clean bentonite grout. However, bentonite grout may not be used if the groundwater contains chlorides above 1,500 parts per million or if hydrocarbons are present.
- The top two feet above any bentonite grout or bentonite chips or pellets shall be filled with cement as an atmospheric barrier to prevent the clay from drying out.
- Wells that do not encounter groundwater (dry holes) may be plugged by backfilling with drill cuttings. The backfill material shall be mounded above the surrounding surface to compensate for settling.
- Waste materials shall be properly disposed of according to Federal and State regulations and the Statement of Work (SOW).

210.4 Reporting: The Contractor shall file Well Plugging Reports in accordance with 16 TAC 76.70 and 76.71, and Texas Occupations Code Title 12 Chapter 1901. The Contractor shall document plugging and abandoning wells per the Deliverables section of the SOW for the project and per ENV ITEM 103 – Purchase Order Deliverables.

212 Assessment and Removal of Abandoned Pipelines

212.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for the assessment and removal of abandoned pipelines within TxDOT right-of-way.

212.2 Procedures: The Contractor shall use the following procedures to assess and subsequently remove abandoned pipelines from TxDOT right-of-way:

Coordination: Coordinate the assessment and abandonment activities with the ROW Division or District (Map, Survey and Utility Section) that has requested removal.

Preliminary Site Visit: If necessary, perform a preliminary site visit to prepare the statement of work, health and safety plan, and traffic control plan.

Health and Safety Plan: Prepare plan and gain TxDOT approval prior to initiating fieldwork activities.

Traffic Control Plan: If identified in the SOW, develop a traffic control plan in accordance with ENV ITEM 131.

Utility Locating: In accordance with ENV ITEM 130, notify the utility locating service for the area of planned excavation activities. It may also be necessary to contact the respective district's utility section if TxDOT utilities are within the pipeline removal area.

Field Logbook: Record fieldwork in the field logbook in accordance with ENV ITEM 138.

Ownership Assessment: Determine pipeline and/or easement ownership (e.g., title search; known pipeline review; Texas Railroad Commission records review, U.S. Pipeline and Hazardous Materials Safety Administration records review).

Pipeline Assessment (as outlined within the SOW):

212.2.1 Verify from the owner or records that the pipeline is abandoned and out-of-use.

212.2.2 Notify local emergency personnel and complete pre-field work activities listed above and notifications.

212.2.3 Excavate and expose pipeline.

212.2.4 If the pipeline has a coating, sample the coating to determine if the coating contains Asbestos Containing Materials (ACM).

212.2.5 Conduct a non-destructive evaluation to determine if the pipeline is active and conveying fluid (e.g., liquid ultrasonic flow meter).

212.2.6 Determine if the pipeline is being protected from corrosion by induced current or other system.

212.2.7 Determine pipeline wall thickness (ultrasonic wall thickness determination).

212.2.8 Conduct intrusive evaluation (pipeline hot tap) to determine contents of the pipeline.

Pipeline Removal:

212.2.9 Perform pipeline cutting at the ROW line. Cleaning (residual fluid removal) / capping of the pipeline ends at the ROW line.

212.2.10 Dispose of investigation derived wastes, excavation wastes, and pipeline wastes (residual fluids, etc.) in accordance with applicable state and federal laws and regulations.

212.2.11 Remove pipeline in the ROW and transport it for disposal or recycling in accordance with applicable state and federal laws and regulations.

Backfill and Compaction:

212.2.12 Backfill and compact (backfill as specified by the TxDOT Area Engineer or Project Specifications) any remaining trenches and pits with excavated material and restore the grade to an elevation suitable for future construction needs.

212.3 Final Report: The Contractor shall prepare a Final Report as outlined in the Contract, SOW, and ENV ITEM 103 – Purchase Order Deliverables, and it must include the following items in the report.

- A description of materials, controls, and work practices used to remove pipeline,
- Quantity of pipeline removed,
- Results of the removal work, including a statement confirming completion of all removal activities, and/or a description and explanation for any pipeline that could not be removed, and
- Photographic documentation illustrating removal of the pipeline.

213 Asbestos-Cement Pipe (Transite®) Removal and Disposal

213.1 Description: This Standard Operating Procedure (SOP) identifies the requirements for the removal and disposal of asbestos-cement pipes (Transite® utility lines) located within TxDOT right-of-way.

213.2 Procedures: The Contractor shall use these procedures when removing and disposing of asbestos-cement pipes, commonly referred to as Transite® pipe.

213.2.1 Project Coordination: Coordinate with TxDOT and other interested parties (city, counties, design engineers, utility contractors, prime construction contractors, etc.), on project schedules and timelines. The Contractor shall make every effort to schedule and perform the work within the timelines agreed.

213.2.2 Excavation Procedures: Coordinate with TxDOT and the other interested parties in determining excavation procedures and/or responsibilities, as outlined in the Statement of Work (SOW).

213.2.3 Removal Procedures: The Contractor shall use the following procedures to remove and dispose of asbestos-cement pipes, or as outlined in the SOW.

- Provide required regulatory notifications for asbestos abatement work through the Texas Department of State Health Services (TDSHS),
- Do not grind, abrade, or otherwise disturb the ACM in a manner that would cause an asbestos hazard or visible fiber release.
- Remove the asbestos-cement pipe from the excavation in accordance with all applicable regulatory requirements, including 40 CFR 61.145 (Standard for Demolition and Renovation – Asbestos NESHAP) and 29 CFR 1926.1101 (Safety and Health Regulations for Construction, Toxic and Hazardous Substances - Asbestos OSHA).
- Properly classify, contain, transport, and dispose of the removed asbestos-cement pipe in accordance with local, State, and Federal regulations.
- Restore site to near-original condition by removing all materials, equipment, and debris upon completion of asbestos-cement pipe removal activities.

213.3 Final Report: The Contractor shall prepare a Final Report as outlined in the Contract, SOW, and ENV ITEM 103. The report must include the following items.

- A description of materials, controls, and work practices used to remove asbestos-cement pipe.
- Quantity (length) and diameter of asbestos-cement pipe removed.
- Results of the removal work, including a statement confirming completion of all removal activities, and/or a description and explanation for any asbestos-cement pipe that could not be removed.
- Photographic documentation illustrating removal of the asbestos-cement pipe.

- Documentation demonstrating compliance with 40 CFR 61.145 (NESHAP) and 29 CFR 1926.1101 (OSHA), including results of required employee monitoring and/or negative exposure assessments, and TDSHS.

221 Soil and Groundwater Management Plan(s)

221.1 Description: This Standard Operating Procedure (SOP) identifies the requirements to create a Soil and Groundwater Management Plan (SGMP) for the mitigation of contaminated media related to TxDOT construction activities. If directed by the Statement of Work (SOW), the SGMP will become part of a special specification that will direct construction contractors on how to manage and dispose of contaminated media within a construction zone.

221.2 SGMP Style: The consultant shall utilize the following limitations/standards when preparing the SGMP:

- State the construction contractor's requirements only once (other than as part of process flow charts) and do not include an executive summary.
- Do not give options (multiple methods) to the construction contractor in detailing how to manage each contaminated media, unless otherwise directed by the SOW.
- Prepare the plan as a directive, using imperative voice.
- Always capitalize CONTRACTOR, ENVIRONMENTAL SPECIALIST, or TxDOT when directing them to perform a task.
- Utilize cost effective procedures and easily purchased products, as applicable; and
- Identify on the cover page that TxDOT will sign as Generator on any soil or groundwater requiring disposal.

221.3 Procedures: At a minimum, the consultant shall prepare the SGMP to include the following, unless otherwise outlined within the SOW.

221.3.1 SGMP Zone – Indicate the exact location on a diagram from the Project Plans, Specifications, & Estimates (PS&E) and within the initial paragraph of the plan where the SGMP Zone starts and ends using the construction project plan station numbers.

221.3.2 Contaminated Media Information – Summarize past studies performed on the subject site detailing:

- The chemicals-of-concern and their concentrations.
- The impacted media (surface soils, surface water, subsurface soils, sediment, groundwater, etc.).

- The known and/or suspected horizontal and vertical extent of the contaminated media; and

- The potential hazards/exposure impacts to construction workers.

221.3.3 Summary of potentially impacted construction improvements – Detail what part of the construction project will potentially be affected by the contaminated media (storm sewers, bridge column drill shafts, retaining walls, roadway excavations, etc.)

221.3.4 Soil Management – The consultant shall evaluate methods to manage contaminated soils potentially affecting improvements within the SGMP Zone. The consultant shall consider costs and ease of construction (the least impact to normal construction methods while still providing effective management of contaminated soils). The SGMP shall include detailed written methodologies on managing the potentially contaminated soils within the SGMP Zone. The consultant shall include the rules and regulations that govern the methodologies chosen.

221.3.5 Groundwater Management – The consultant shall evaluate methods to manage contaminated groundwater potentially affecting improvements within the SGMP Zone. The consultant shall consider costs and ease of construction (methods with the least impact to normal construction while still providing effective management of contaminated groundwater). Different techniques for groundwater disposal may be used under this heading, but will be based on a total gallon limit for the project, or as directed by the SOW. The SGMP shall include detailed written methodologies on managing potentially contaminated groundwater within the SGMP Zone. The consultant shall include the rules and regulations that govern the methodologies chosen.

221.3.6 Construction Materials – The consultant shall evaluate all construction products used within the SGMP Zone. The consultant shall include a written description of the findings and/or alternatives within the SGMP, upon concurrence by the ENV Project Manager and the district Point-of-Contact (POC) outlined within the SOW. If the consultant recommends alternatives to the original design, the consultant shall then supply plan details and specifications of the new products to the district POC and the ENV Project Manager.

- The consultant shall evaluate all construction products used within the SGMP contamination zone for compatibility with the contaminated media. If the construction products are not compatible with the contaminated media, then the consultant shall use an alternative product. The consultant will evaluate the alternative product for cost, reliability/life cycle, ease of installation and use, and accessibility for procurement.

- The consultant shall evaluate all potential multi-media migration pathways created by the construction improvements. This will include all vertical and horizontal pathways. If the evaluation indicates a potential pathway issue, the consultant will design method(s) to prevent migration of any contamination or potentially contaminated media along or through the construction improvement.

Note: Examples of horizontal pathways may be a graded drain through a groundwater plume or gasses migrating along a pipe chase. Examples of a vertical pathway may be a bridge column installation through multiple confining layers.

221.3.7 Environmental Specialist – The consultant shall detail the requirements for the Prime Construction Contractor to use an Environmental Specialist to manage the requirements outlined within the SGMP. The consultant shall include a bulleted list of duties required by the Environmental Specialist to include a time schedule to complete the activities. At a minimum, the consultant shall use the following listed items within this section as requirements for managing and using the Environmental Specialist.

- The Prime Construction Contractor shall bill at a rate no greater than a Field Technician for the onsite Environmental Specialist. TxDOT shall negotiate the rates with the Prime Construction Contractor prior to work commencing on the project.

- The Environmental Specialist shall have at least two verifiable years performing the work outlined within the SGMP (preferred). TxDOT shall review the verifiable proof prior to the work commencing on the project.

- The Environmental Specialist shall have 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training.

- The Environmental Specialist shall work for a firm who holds a registration in one (1) or more of the following: Professional Engineer by the State of Texas, Registered Environmental Manager/Registered Environmental Professional by the National Registry of Environmental Professionals, Professional Geoscientist by the State of Texas, or a TCEQ-registered Corrective Action Project Manager (if applicable).

221.3.8 Revisions to the SGMP: The consultant shall include a sub-heading within the SGMP that outlines the requirements to make corrections or updates to the SGMP.

221.3.9 The consultant shall include as an attachment(s) separate process flow chart, one process per sheet, for each potentially contaminated media (soil, groundwater, atmospheric, etc.). Each process flow chart will graphically depict the method for handling the specific contaminated media from discovery to final disposition (example: the steps and decisions that must be followed to handle contaminated soils).

221.4 Field Documentation and Reporting: The consultant shall include a section within the SGMP that outlines the field documentation and reporting required for submittal to TxDOT at the close of the project. At a minimum, the consultant shall include the following in the SGMP:

- SGMP Acceptance: Include an attachment that provides for written documentation from the Prime Construction Contractor, Sub-Contractor(s), Environmental

Specialist, and all personnel working within the SGMP Zone to verify that they have read the SGMP and understand the contents.

Note: The initial SGMP Acceptance Form must be signed and dated prior to work commencing on the project. The SGMP Acceptance form is to be re-signed and delivered to TxDOT when changes to the plan or workers are made.

- Field logs and daily activities summaries: The Environmental Specialist shall submit daily activity summaries to the Prime Construction Contractor and TxDOT to verify work performed and time allocation (can be e-mailed). The Prime Construction Contractor shall use a field log for the entire project and submit this to TxDOT at the end of the project.

- The Environmental Specialist shall develop a SGMP final report and submit it to TxDOT through the Prime Construction Contractor at the construction project completion. The final report will contain, at a minimum:

    - Daily field logs.

    - All laboratory results with sample locations.

    - All corrections and revisions to the SGMP.

    - Disposal manifests.

    - Personnel and company responsible for managing the SGMP, including names and certifications; and

    - All other items related to the regulatory handling of the contaminated media, per the SGMP.

222 Construction Oversight

222.1 Description: This Standard Operating Procedure (SOP) identifies the requirements to provide third-party oversight for environmental-related work performed by a Prime Construction Contractor.

222.2 Procedures:

Preliminary Project Review: The Contractor shall review all management plans and/or specifications related to the environmental work. The Contractor shall review all construction related requirements affected by the environmental condition.

Communication Requirements: The Contractor shall prepare a written Communication Plan (CP) that describes in detail the communication hierarchy for information distribution related to the project oversight. The CP shall include names and contact information, including emergency contact information, and the preferred methods of routine, and emergency communication distribution. The Prime Construction Contractor and the TxDOT Point-of-Contact (POC) for the project will sign the CP.

Construction Monitoring: The Contractor shall provide construction oversight as directed within the Soil & Groundwater Management Plan (SGMP), remedial action plan, and/or corrective action plan and/or as outlined with the SOW.

Routine Reporting: The Contractor shall prepare a typed weekly report throughout the duration of the oversight detailing the field activities, and as a default, will disseminate to the ENV Project Manager and the POC by e-mail, or as defined by the SOW. This report shall include attachments such as maps, figures, analytical results, manifests, and other information concerning the management of the oversight activity.

222.3 Reporting: The Contractor shall prepare a final report for the construction oversight activities. The report shall include copies of the weekly reporting, the field logbook, photographs, and all other information gathered for the project execution.

223 Biological Waste Removal and Disposal

223.1 Description: This Standard Operating Procedure (SOP) identifies the requirements to provide biological waste removal and disposal from tub-girder type bridges.

Note: Biological waste is defined as pigeon or bat droppings and carcasses.

223.2 Procedures: The Contractor shall use the following procedures for biological waste removal and disposal from tub-girder type bridges:

- Prepare Health and Safety Plan.
- Set up decontamination area, command center area, and rest area secured with orange safety fencing.
- Clean the area with shovels and brooms, placing the collected biological waste (and construction debris that will fit through access openings) into plastic trash bags. Dispose of the plastic trash bags in lined roll-off boxes staged at the site.
- After the initial cleaning, pressure wash and mop the inside of the tub girder.
- Apply Zepamine (or another approved biocide) for the final cleaning.
- Secure against future bird or bat access by covering unsecured entry locations.
- Properly dispose of accumulated wastes in the roll-off boxes at an approved landfill.

223.3 Field Notebook: The Contractor shall keep a field notebook following ENV ITEM 138.

223.4 Reporting: The Contractor shall submit the project deliverables per ENV ITEM 103, Purchase Order Deliverables.

224 Waste Segregation, Characterization, and Disposal

224.1 Description: This Standard Operating Procedure (SOP) identifies the steps for identification, handling, and disposal of waste materials encountered on TxDOT Right-of-Way (ROW).

Note: The materials may include drums, 5-gallon buckets, tanks, waste piles, or waste in other forms. This procedure addresses the situation where the owner of the waste cannot be identified.

224.2 Procedures: The Contractor shall use the following procedures when identifying, handling, characterizing, transporting, and disposing of abandoned waste materials.

224.2.1 Preliminary Site Visit: The Contractor shall survey the location and materials to identify the nature and potential owner of the waste. This should include reviewing labels or other markings that would identify the material, surveying the former use of the property, and taking into consideration process knowledge given the location and visual nature of the material (e.g. oil-filled drums at a former gas station or dumped roofing shingles with fibrous material).

The Contractor shall identify the appropriate nearest landfill/recycling facility to the subject property. Additionally, the Contractor shall determine the appropriate analytical testing based on coordination with the disposal facility and appropriate TCEQ, Texas Railroad Commission (TRRC), or Texas Department of State Health Services (TDSHS) regulations.

Note: This may include a determination whether the material is hazardous or non-hazardous waste, construction debris, contains fibrous material that could be asbestos, etc. Testing should only be performed to the degree required by the disposal facility based on site factors and process knowledge in the context of TCEQ, TRRC, or TDSHS regulations.

The Contractor shall evaluate the analytical data collected for disposal/recycling options. In addition, the Contractor shall use the results for any additional labeling and manifesting requirements prior to shipment. The contractor shall complete waste profile forms provided by the disposal facility. A TxDOT representative will sign the form as a material generator. Alternatively, signature authority may be delegated in writing by TxDOT to the Contractor.

224.2.2 Manifesting and Disposal: The Contractor shall use a manifest for waste transported from the location to a recycling/disposal facility. The Contractor shall ensure that the selected transporter and disposal/recycling facility have the required local, State, and/or federal permits and/or licenses. TxDOT will serve as the generator of the material with the Contractor acting as TxDOT's agent.

224.3 Reporting: The Contractor shall submit project deliverables per ENV ITEM 103, Purchase Order Deliverables. The Contractor will include copies of the field logbook (including pictures of the materials), analytical testing results, and waste characterization/ waste manifest forms within the project deliverable(s).

225 Drilling Mud Collection and Disposal

225.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for the use, collection, storage, sampling, characterization, and offsite disposal/recycling of contaminated drilling mud.

225.2 Procedures: The Contractor shall use the following procedures for the management, characterization, and disposal/recycling of drilling mud:

- Coordinate efforts with the Prime Construction Contractor to maximize the number of potentially impacted locations drilled sequentially to minimize the amount of contaminated drilling mud produced.
- Sample the containerized drilling mud for every 5,000 gallons for waste characterization, or as outlined in the SOW.
- Prepare a waste profile and submit it to the disposal/recycling facility for acceptance.
- Prepare a waste manifest from the approved disposal/recycling facility in accordance with applicable regulatory guidelines prior to removing the drilling mud from the project location.
- After receiving approval documentation from the disposal/recycling facility, transport the waste by a State-licensed transporter subcontracted by the Contractor.
- Prior to offsite disposal/recycling, either a TxDOT employee or TxDOT third-party representative will sign the waste manifests on behalf of TxDOT. The Contractor shall keep copies of all waste manifests and then provide them to TxDOT in the final deliverable.
- Track the transport vehicles and waste manifests for documentation purposes.
- Document decontamination procedures prior to moving equipment to non-affected project locations.

225.3 Field Notebook: The Contractor shall keep a field notebook following ENV ITEM 138. At a minimum, the field notebook shall document the tracking information for each waste shipment as follows: manifest number, shipment date, transporter name, waste type, waste code if applicable, volume, waste profile approval number, and the designated disposal/recycling facility.

225.4 Reporting: The Contractor shall submit Daily Reports that will include the information outlined in the Field Notebook documentation itemized in Section 225.3.

226 Soil or Solid Waste Reuse or Excavation, Transportation, and Disposal

226.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for reuse, storage, sampling, characterization, and off-site disposal/recycling of soil or solid waste.

226.2 Procedures: The Contractor shall reuse excavated soils in accordance with the United States Environmental Protection Agency Letter (9441.1992(16)), Sylvia K. Lowrance, Director, Office of Solid Waste dated June 11, 1992.

226.3 Procedures: The Contractor shall use the following procedures for the management, characterization, and disposal/recycling of soils or solid wastes:

- Temporarily store/containerize on-site or in a designated area using plastic sheeting, 55-gallon drums, or roll-off containers. Take proper precautions to ensure the safety of workers and the public.
- Sample the soil or solid waste for waste characterization. Collect samples per the cubic yard volume required by the proposed receiving facility for waste characterization.
- Prepare a waste profile and submit it to the disposal facility for acceptance.
- Obtain the waste manifests from the approved receiving facility in accordance with applicable regulatory guidelines.
- Transport the soil or solid waste by a State-licensed transporter.
- Accompany each shipment with a waste manifest.
- Prior to off-site removal, either a TxDOT employee or TxDOT third-party representative will sign the waste manifests on behalf of TxDOT. The Contractor shall keep copies of all waste manifests and then provide them to TxDOT in the final deliverable.
- Track the transport vehicles and waste manifests for documentation purposes.
- Document decontamination procedures prior to moving equipment to non-affected project locations

226.4 Field Notebook: The Contractor shall keep a field notebook following ENV ITEM 138. At a minimum, the field notebook shall document the tracking information for each waste shipment as follows: manifest number, shipment date, transporter name, waste type, waste code if applicable, volume, waste profile approval number, and the designated receiving facility.

226.5 Reporting: The Contractor shall submit Daily Reports that will include the information outlined in the Field Notebook documentation itemized in Section 226.4. Submit final project deliverables as specified in ENV ITEM 103, Purchase Order Deliverables and in accordance with the Contract requirements.

227 Soil Replacement and Compaction

227.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for “backfilling” an open excavation and machine compaction.

Note: The term “backfilling” is defined as filling an open excavation to grade with a TxDOT-approved material.

227.2 Procedures: The Contractor shall use the following procedures for backfilling/ compacting an open excavation:

- The Contractor will backfill the excavation as soon as possible to ensure safety at the project site. Surround any open excavations with fencing, “caution tape”, cones, or equipment to prevent access.
- The Contractor shall use a TxDOT-approved backfill material free of stones or other material large enough to interfere with compaction. As a default, the Contractor shall use Class III clayey gravel or sand or Class IV lean clay with a plasticity index between 7 and 20.
- Backfill excavations in 6-inch lift increments (loose measurement).
- Apply the deadweight of the machine (backhoe or excavator bucket) downward on the soil surface, compressing the soil particles.
- Repeat lifts until at finished grade.

227.3 Reporting:

Field Activity Daily Report(s): In addition to the requirements identified by the project for Field Activity Daily Report(s), the Contractor shall include the following items for verification of soil replacement and compaction for that day:

- The number of truckloads and type of imported soil,
- The number of compacted lifts,
- Compaction methods, and
- Total cubic yards used to backfill the open excavation to grade.

Final Report: In addition to the requirements identified by the project Statement of Work for a Final Report, the Contractor shall include the following items for verification of soil replacement and compaction:

- The project total number of truckloads and type of imported soil,
- The number of compacted lifts,
- Compaction methods, and
- Project total cubic yards used to backfill the open excavation to grade.

228 Air Monitoring for Construction

228.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for performing air monitoring for construction activities.

Note: The purpose of air monitoring is to collect chemical vapor or dust data for comparison to permissible exposure limits (PELs) so action can be taken before workers are adversely affected from an inhalation hazard. Air Monitoring for potential chemical exposure is a subset of an overarching Health and Safety Plan for the project.

228.2 Procedures: The Contractor shall use the following procedures when performing air monitoring on TxDOT ENV projects, or as directed by the project specific Health and Safety Plan (HSP).

- Select a single PEL for evaluating air-monitoring data when multiple chemicals are present. A single level will enable quick and efficient identification of conditions that could adversely affect worker health and safety.
- Use the appropriate PELs relative to all appropriate industry source of exposure data such as OSHA, NIOSH and ACGIH.
- Take a baseline, air quality sample, before commencement of work activity.
- Identify fixed monitoring locations or mobile monitoring locations on a project specific basis.
- Specify upwind and downwind monitoring locations in addition to monitoring locations in the exclusion zone.
- Specify stop work thresholds.
- Identify mitigation methods to address elevated monitoring data.

<u>Air Monitoring Equipment</u>

- Specify the type, make, and model of the equipment used on the project.
- Calibrate equipment before each use.

<u>Air Monitoring Documentation</u>

- Document calibration activities

229 Groundwater Collection and Disposal

229.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for the collection and disposal of contaminated groundwater generated from TxDOT construction activities.

Note: These activities may include dewatering of trenches, excavations, or drill shafts in areas where groundwater contamination is confirmed prior to construction or when contamination is found or suspected during construction activities.

229.2 Procedures: The Contractor shall collect, containerize, characterize, and select a properly licensed transporter and disposal company to remove affected groundwater generated by construction activities. The Contractor shall not pump or discharge contaminated groundwater onto the ground surface or into a Municipal Storm Sewer System (MS4) unless the appropriate permits have been obtained. All drilling mud fluid or filtrate from water-based drilling that is contaminated shall be contained and properly disposed.

Alternatively, for conditions that may produce large quantities of contaminated groundwater, and it is logistically feasible, the Contractor may obtain a permit to discharge the water into a local publicly owned treatment works (POTW).

229.2.1 Collection and Storage: The Contractor shall remove the contaminated water from the construction area (e.g. trench, excavation, or drill shafts) directly into a clean storage container. Generally, this will involve pumping the water directly to a container located in a TxDOT-approved location, or into a container to be transported to an approved location. The storage container shall contain the water or drilling mud filtrate without leaking and without allowing rainfall infiltration. Examples of appropriate containers include sealed holding tanks (e.g. frac tanks), IBC tote tanks, drums, etc.

For groundwater or drilling mud displaced during the placement of concrete into a drilled shaft, the above collection and storage procedures will apply. The Contractor may use alternative methods if approved by TxDOT through the statement of work.

229.2.2 Characterization, Transportation and Disposal: The Contractor shall properly characterize the stored groundwater for ultimate disposal. Complete the characterization per ENV ITEM 224 Waste Segregation, Characterization, and Disposal. The Contractor will utilize the characterization data to profile the groundwater and to obtain transport and disposal approval from the Contractor's selected transporter and disposal facility. Provide copies of the transportation and disposal manifests to the TxDOT Project Manager upon completion.

231 Spill Prevention Control and Countermeasures Plans

231.1 Description: This Standard Operating Procedure (SOP) identifies the procedures required for the preparation of Spill Prevention Control and Countermeasures (SPCC) Plans for TxDOT facilities.

231.2 Procedures: The Contractor shall utilize the following procedures when preparing SPCC Plans for TxDOT facilities.

Regulatory Compliance: The Contractor shall prepare and/or update all SPCC Plans for TxDOT facilities in strict compliance with 40 CFR Part 112. Unless otherwise specified in the Work Authorization (WA) or in a Supplemental WA, the final SPCC Plan deliverables shall not include recommendations to bring the facility into compliance with the SPCC rule.

Note: Needed facility upgrades shall be discussed during the performance of the site visit, and the facility shall be given the opportunity to complete the upgrades needed prior to the final Plan preparation. If the needed facility upgrades cannot be completed in a timely manner, to be agreed upon by TxDOT and the Contractor, a Supplemental WA shall be prepared to allow recommendations for achieving compliance in the final deliverable.

Practicality: The Contractor shall prepare SPCC Plans in accordance with good engineering practices, and such that the Plans are cost-effective, practical to implement, and can be implemented using primarily State in-house resources, as available.

Specificity: The Contractor shall prepare each SPCC Plan with site-specific graphics, tabulated inventory, tank inspection schedules, notes, etc. “Typical” notes or legends shall not be acceptable. Tank integrity testing schedules shall include a specific date by which each tank (as applicable) is required to undergo an initial integrity test, and a specific interval at which subsequent testing shall be required. When applicable, specific integrity testing procedures or standards shall be detailed for each tank.

Personnel Training Criteria – The SPCC Plan shall include guidance for required on-site personnel training. The Plan must also include a schedule for required Plan reviews, updates, and the personnel required to perform the reviews.

Deliverable(s) – In addition to the deliverable(s) requirements specified in ENV ITEM 100, and in the WA, each SPCC deliverable must meet the following requirements:

Text – Provide the deliverable in an unprotected Microsoft Word file format (i.e. *.docx).
Graphics – Provide the graphic contents part of the deliverable in a MicroStation file format (i.e. *.dgn).
Binding – Provide the hardcopy deliverable in a three-ring binder format.

232 Scrap Tire Collection, Transportation, and Recycling /Disposal

232.1 Description: This Standard Operating Procedure (SOP) identifies the procedures to be utilized by TxDOT Contractors when planning and executing TxDOT scrap tire management projects.

Note: Typically, scrap tire management projects shall be performed at new right-of-way (ROW) locations where used or scrap tires have been abandoned and left on the property during the ROW acquisition phase of a roadway project. Other projects may include existing ROW locations where used, or scrap tires have been illegally dumped.

232.2 Procedures: The Contractor shall ensure that all used, or scrap tires collected from the ROW parcel are transported, and disposed, or recycled in accordance with Title 30 of the Texas Administrative Code (TAC) Chapter 328 Subchapter F pertaining to the management of used or scrap tires. Recycling and energy recovery are the preferred disposition for used or scrap tires collected from TxDOT ROWs, if the cost is not prohibitively higher than disposal. TxDOT may request that the Contractor receive bids for disposal and recycling options.

232.2.1 Inventory and Sorting: The Contractor shall mobilize personnel to the ROW parcel location provided in the statement of work. The field personnel shall sort and inventory the scrap tires by type (e.g. number of passenger vehicle/light truck tires, number of large truck tires, number of off-road vehicle tires, etc.) and shall designate in the inventory whether the tires are on rims/wheels or off.

232.2.2 Scrap Tire Manifesting and Transportation: The Contractor shall properly manifest the scrap tires for transport and shall use the Texas Commission on Environmental Quality (TCEQ) manifest form TCEQ-10304, or an equivalent form. The Contractor shall complete the manifest on TxDOT's behalf by completing and signing the Generator Information and Certification portion of the manifest. The Contractor shall use the previously completed inventory information to record the number of tires on the Generator portion of the manifest. Use "Texas Department of Transportation" as the Generator of the scrap tires.

The Contractor shall hire a properly licensed Scrap Tire Transporter to transport the tires to a properly licensed Scrap Tire Processing facility or Scrap Tire Disposal facility. The contractor shall oversee the loading by the Transporter and shall receive and forward a copy of the Transportation Manifest to the TxDOT ENV Project Manager with the final deliverable.

232.3 Reporting: The Contractor shall document the scrap tire removal per the Deliverable section of the Statement of Work for the project, and per ENV ITEM 103 – Purchase Order Deliverables.

241 Remedial/Corrective Action

241.1 Description: This Standard Operating Procedure (SOP) identifies the procedures governing the development, implementation and reporting of remedial and/or corrective action activities performed by ENV.

Note: Since the breadth of remedial and/or corrective action is extensive, the Statement of Work (SOW) shall provide most of the details.

241.2 Procedures: The Contractor shall utilize the following generic procedures when performing remedial/corrective actions:

> **241.2.1 Cost Benefit Analysis:** Perform and document a cost-benefit analysis for at least two appropriate technologies and options, including entire life-cycle costs, for performing site remediation.
>
> **241.2.2 Project Implementation Plan:** Upon written approval of the appropriate remedial/corrective action by the ENV Project Manager and if required by the regulatory agency, prepare a Project Implementation Plan, as detailed by the Statement of Work.

241.3 Personnel: As applicable, prepare the remedial/corrective action plan under the supervision of, and signed and sealed by a Texas licensed Professional Engineer, Professional Geoscientist, or Leaking Petroleum Storage Tank (LPST) Corrective Action Project Manager.

241.4 Permits: Identify and secure all necessary construction and/or regulatory permits and approvals required for remedial/corrective action implementation.

241.5 Reporting / Deliverables: Prepare all Draft and Final Reports (Deliverables) per regulatory agency specifications for the appropriate technologies and in accordance with ENV ITEM - 103 Purchase Order Deliverables.

241.6 Regulations / Guidance

- Title 6 Occupations Code Chapter 1001 (Texas Engineering Practice Act.)
- Title 6 Occupations Code Chapter 1002 (Texas Geoscience Practice Act)
- Title 30 Texas Administrative Code (TAC) Section 334.451 (relating to the applicability of LPST Corrective Action Specialist Registration and Project Manager Licensing)
- 30 TAC 334.81 (relating to Corrective Action Plans for LPST Sites)
- TCEQ Regulatory Guidance “Corrective Action Plans for LPST Sites” ((RG-523/PST-10)

- TCEQ Regulatory Guidance “Operation, Monitoring, and Performance of Remediation Systems at LPST Sites” (RG-523/PST-11)
- 30 TAC 350.94 (relating to Response Action Plans under the Texas Risk Reduction Program)

250 Mobile Dual Phase Extraction

250.1 Description: This Standard Operating Procedure (SOP) identifies the procedures for development, implementation, and reporting of Mobile Dual Phase Extraction (MDPE) events.

Note: MDPE equipment selection and event duration shall be proposed by the Contractor and approved by the TxDOT Project Manager and TCEQ, as appropriate. MDPE should be proposed as a fixed duration event (e.g. 8, 24, or 72-hours). Typically, longer duration events should be proposed based on the effectiveness of the previous event.

The cost proposal shall include the following:

- All equipment, material, and labor
- All permits
- Mobilization / demobilization
- Field oversight by a qualified Field Technician
- Field data
- Well gauging
- Sample collection
- Utility and/or fuel costs.
- Security guards or chain link fence, if required.
- Waste disposal and/or treatment
- Laboratory analyses
- Sample shipping
- Reporting

250.2 Procedures: MDPE equipment shall be designed for the simultaneous extraction of vapor and liquid. Groundwater extraction shall be conducted during the MDPE event to depress the groundwater table and expose the smear zone to vapor extraction. MDPE is generally more successful when the water table is naturally depressed to minimize the amount or groundwater generated requiring treatment or disposal.

Real-time data is required for continuous monitoring throughout the duration of the event. Brief interruptions for fueling, maintenance, gauging the depth to water/Light Non-Aqueous Phase Liquid (LNAPL) and adjusting stinger tube or pump intake positions are integral to the event.

250.2.1 Permits: The Contractor shall identify and secure all applicable regulatory permits, including those required for air emissions and the selected liquid treatment and discharge methods, if applicable.

250.2.2 Implementation: There are significant variations in MDPE equipment and applications. The following examples represent implementation procedures for common types of equipment:

Stinger (Drop) Tube Single Pump:

- Evacuate total fluids from extraction wells containing LNAPL greater than 0.1 feet for approximately 15 minutes prior to sealing off the extraction well head(s), then adjust stinger tube positions so that the end of the stinger tube is at the oil-water interface, or approximately six (6) inches below the water level if no LNAPL is present. Then seal off the well head and apply vacuum for dual-phase extraction for the duration of the event. As the event progresses, adjust stinger (drop) tube as necessary to ensure optimal LNAPL recovery.

Submersible/Dual-Pump:

- Set the intake of the pump below the oil-water interface, as shallow as possible depending on the type of pump and depth to water, to pump total fluids for approximately 15 minutes. After initially pumping for 15 minutes, adjust the pump position so that the intake of the pump is approximately two (2) feet below the oil-water interface or water table if no LNAPL is present. Then seal off the well head and apply vacuum for dual-phase extraction for the duration of the event. As the event progresses, adjust the pump position to ensure optimal LNAPL recovery.

250.2.3 Well Gauging: Wells used for extraction and observation shall be gauged to determine depth-to-water/LNAPL and LNAPL thickness immediately prior to and following each event.

250.2.4 Sampling:

Influent/Effluent Vapor Samples:

- During the extraction process, vapor samples must be collected to demonstrate compliance with State air standards, and the effectiveness of the extraction system. Texas Administrative Code (30 TAC), Chapter 106, Permits by Rule, Subchapter X requires that the total emission of petroleum hydrocarbons shall not exceed 1.0 pound/hour for TPH and 0.1 pound/hour for benzene.
- Vapor samples should be collected using Tedlar bags, Bottle Vacs., or Summa Canisters. Tedlar bag samples should be stored in rigid containers away from UV light.
- Sample holding times per collection container:
    - Samples collected in Tedlar bags must be analyzed within 72 hours of collection.
    - Samples collected in Bottle Vac containers must be analyzed within 14 days of collection.
    - Samples collected in a Summa Canister must be analyzed within 30 days of collection.
- Vapor samples shall be collected for lab analysis as follows: Three (3) influent vapor samples (collected at beginning, middle, and encl of the event) and one (1)

effluent vapor sample (collected one hour after startup of the event). The first and the last influent vapor samples shall be analyzed for TPH GC (Modified EPA 8015-GRO); all other influent and effluent vapor samples shall be analyzed for BTEX GC (Modified EPA 8021) and TPH GC (Modified EPA 8015-GRO).

250.2.5 Liquid disposal, treatment and discharge: The Contractor shall comply with all liquid disposal (water of LNAPL) or treatment and discharge requirements applicable to the selected method.

250.3 Reporting: The Contractor shall complete a MDPE Report (see below for format and content) documenting each MDPE event. The Contractor shall prepare all draft and final reports (Deliverables) in accordance with ENV ITEM 103 (Purchase Order Deliverables).

250.3.1 Mobile Dual-Phase Extraction (MDPE) Report (format and content): The MDPE Report shall include a cover letter providing a summary of activities completed, evaluation of the data generated, and any deviations from the Statement-of-Work (SOW). The report shall also include the following:

- Product Recovery Report (TCEQ-0025) with attachments.
- Narrative description of MDPE equipment (including, vacuum source, vapor treatment method, vapor treatment unit capacity, liquid recovery method, water treatment system and capacities, and waste management), field work performed, and any anomalous results.
- Site Map depicting extraction and observation wells.
- Gauging data table for extraction and observation wells
- Performance data tables with field measurements for the duration of the event - including, vacuum readings, airflow readings, field vapor concentration readings, vapor temperature, ambient air temperature and pressure and vapor treatment unit temperature.
- Conversion of airflow rate from ACFM to SCFM and calculation of the vapor recovery rate based on laboratory analytical results.

Attachments:

- Laboratory analytical report(s)
- Field notes.
- Photographic documentation of the event.
- Waste disposal documentation and manifests.
- Copies of required permits.

Appendix A

The following table shows the revision history for this guidance document.

Revision History	
Effective Date Month, Year	**Reason for and Description of Change**
August 2025	Version 6 was released. All SOPs were updated. Grammatical errors, hyperlinks, and regulations were updated. No major changes to content.
April 2023	Version 5 was released. The deliverable process for SOPs 100 and 103 was revised to include a Contractor Final Deliverable Packet (CFDP).
August 2020	Version 4 was released. SOP number 135 – Storage Locations was added. These SOPs were removed. Item 228 – Air Monitoring for Construction and Item 133 – Environmental Testing Laboratory Accreditation and Certification.
October 2016	Version 3 was released. The following new SOPs were added numbers, 103, 104, 106, 123, 134, 189, 192, 193, 194, 196, 197, 198, 199, 201, 202, 203, 204, 213, 223, 224, 225, 226, 227, 228, 229, and 232.
March 2016	Version 2 was released.
January 2016	Version 1 was released.