

DIVISION OF UNDERGROUND STORAGE TANKS

GUIDANCE MANUAL

Control Number: UST_G-01

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Cross Reference Mapping Table

This table is intended to be a resource to correspond the former policy documents and titles to the Guidance Manual format. The below table is not exhaustive and should be used as a general outline to aid in the transition to navigating the Guidance Manual.

Former Document Title	New Section / Title
TGD-002 Division of Water Supply's Primary and Secondary Drinking Water Standard	Rescinded. Refer to the Rules of TDEC -Division of Water Resources (DWR) Chapter 0400-45-01 Public Water Systems for the primary and secondary drinking water standards. Also refer to US EPA National Primary Drinking Water Regulations and National Secondary Drinking Water Regulations
TGD-004 Requirements for Free Product Removal (Rev. Nov. 1, 2007)	Section VI.D.3.a. Free Product Section VI.D.3.b. Free Product Investigation and Free Product Removal Plan Section VI.D.3.c. Reporting Schedule Appendix 1.k. Free Product - Hazard Management Report Template Appendix 1.l. Free Product Investigation Plan Appendix 1.m. Free Product Investigation Report
TGD-005 Sampling Requirements for Excavated Material	Section VI.B.3. Excavated Material Screening, Sampling, and Reporting Section VI.B.3.a. Field Screening Procedures Section VI.B.3.b. Soil Sampling Procedures Section VI.B.3.c. Soil Disposal/Treatment Requirements Section VI.B.3.d. Reporting Requirements
TGD-006 Standard Drilling Log	Appendix 1.h. Standard Boring Log Template
TGD-007 Monitoring at UST Sites and Supporting Documents	Section VI.B.26. Vapor Monitoring Section VI.B.27. Receptor Monitoring Section VI.N. Corrective Action Plan Appendix 1.f. Risk Monitoring Report Template Appendix 1.g. Closure Monitoring Report Template Appendix 1.r. Corrective Action Monitoring Report Template
TGD-009 Requirements to Treat Petroleum Contaminated Soil Generated from Releases from USTS and Applications to Treat Petroleum Contaminated Soil by Mobile Thermal Treatment or by Aeration	Rescinded
TGD-010 Procedures to Obtain an NPDES Permit at a Petroleum UST Site and the Division's Interim Requirements	Rescinded. Refer to the Rules of TDEC -Division of Water Resources (DWR), specifically Chapter 0400-40-10 National Pollutant Discharge Elimination System General Permits

Former Document Title	New Section / Title
TGD-012 General Facility Site Check	Section V.C. Site Check Investigation of Environmental Impact (i.e. measure for the presence) of a Release Section V.C.1.a. UST System Release Investigation Section V.C.1.b. Hazard Investigation (if source of impact is unknown) Section V.C.1.c. Combination Investigation (UST system release and hazard investigation) Section V.C.1.d. Other Investigation
TGD-013 Fund Eligibility Site Check	Section V.D. Fund Eligibility Site Check
TGD-016 Mobile Enhanced Multi-Phase Extraction	Section VI.L. Mobile Enhanced Multiphase Extraction (MEME) Appendix 1.o. MEME Application Appendix 1.p. MEME Report
TGD-017 Risk Based Corrective Action	Section VI.F. Initial Site Characterization and Exposure Assessment Section VI.F.a. Instructions for the Risk Analysis Report (spreadsheet completion) Appendix 1.e. Initial Site Characterization Report (ISCR) Template
TGD-018 Requirements for Conducting Soil Gas Surveys	Section VI.K. Soil Gas Survey Appendix 1.n. Soil Gas Survey Application Appendix 1.o. Soil Gas Survey Report
TGD-019 Impacted Drinking Water Management	Section VI.D.1.a. Petroleum Impacted Drinking Water Complaint Response Section VI.D.1.b. Petroleum Impacted Drinking Water Response – Temporary Section VI.D.1.c. Petroleum Impacted Drinking Water Response – Permanent Section VI.D.1.d. Monitoring Section VI.D.1.e. Reporting Schedule Appendix 1.i. Impacted Drinking Water –Hazard Management Report (HMR)
TGD-020 Petroleum Vapor Management	Section VI.D.2.a. Petroleum Vapor Complaint Response Section VI.D.1.b. Petroleum Vapor Hazard Response – Temporary Section VI.D.1.c. Petroleum Vapor Hazard Response – Permanent Section VI.D.1.d. Monitoring Section VI.D.1.e. Reporting Schedule Appendix 1.i. Petroleum Vapor Impact – HMR

Former Document Title	New Section / Title
Site Check Report Guidelines	Appendix 1.a. Site Check Report (SCR) Template
UST System Closure Assessment Guidelines	Section VII. Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure Table 1-2 Initial Screening Levels
Application for Permanent Closure of Underground Storage Tanks	Appendix 1.u. Permanent Closure Application (PCA) Template
Permanent Closure Report	Appendix 1.v. Permanent Closure Report (PCR) Template
Environmental Assessment Guidelines	Section VI. Guidance Related to Rule 0400-18-01-.06 Petroleum Release Response, Remediation, and Risk Management Section VI.C. Initial Response Appendix 1.d. Water Use & Receptor Survey Sheet Templates
Initial Site Characterization Guidelines – Parts A and B	Section VI.E. Initial Response and Hazard Management Report Section VI.F. Initial Site Characterization and Exposure Assessment
Initial Response and Hazard Management Report Guidelines – Part A	Section VI.E. Initial Response and Hazard Management Report Appendix 1.c. Initial Response and Hazard Management Report (IRHMR) Template
Initial Site Characterization Report Guidelines	Section VI.F. Initial Site Characterization and Exposure Assessment Appendix 1.e. Initial Site Characterization Report (ISCR) Template
Corrective Action Plan Guidelines and Corrective Action Plan Supporting Documentation (i.e. CAP Cost Sheets, CAS Figure Packages, CAS Workbook, CAS Deactivation Checklist)	Section VI.M. Pre Corrective Action Plan Meeting Section VI.N. Corrective Action Plan Appendix 1.r. Corrective Action Plan Template
Hazard Notification Report Form	Appendix 1.b. Hazard Notification Report Template
Chemicals of Concern - Reference 1	Table 1-1 Chemicals of Concern (COCs)
Reimbursement Guidance Documents (RGD-002)	Appendix 2 Fund Reimbursement Guidance Related to Rule 0400-18-01-.09 Petroleum Underground Storage Tank Fund (FRG)
Task Cost Sheets	Appendix 2 Section I.F.9. Task Cost Sheets

A. Purpose

The purpose of this Guidance Manual is to further clarify and assist in the implementation of the Tennessee Petroleum Underground Storage Tank Act and Rule.

- Tenn. Code Ann. § 68-215-101:
[Link to the Tennessee Petroleum Underground Storage Tank Act](#)
- Underground Storage Tank Rule 0400-18-01:
[Link to Underground Storage Tank Rules](#)

B. Applicability

This document replaces all previously published guidance.

These guidelines must be followed unless prohibited by site-specific conditions or other applicable statutes, rules or regulations. If these guidelines cannot be followed, then written pre-approval of any modification of the guidelines must be obtained prior to conducting the work. Variances or modifications shall be well documented, by including all prior written approval(s) in the corresponding submittal (i.e. report, test result, etc.)

C. Reporting

The following are electronic mail addresses for submittals, when applicable.

- Application for Permanent Closure of a UST System
Closure.Application.UST@tn.gov
- Report Suspected Release
Releases.UST@tn.gov
- Application for Fund Eligibility
UST.Fund@tn.gov
- Notification Form
Notification.Fees@tn.gov
- Newsletter Topics & Feedback
Tanks.UST@tn.gov

Submit documents for contamination projects through the UST Self-Service Application at:

[Link to UST Self-Service Application](#)

D. Acronyms used in this document

ACFM	Actual Cubic Feet per Minute
ASC	Advanced Site Characterization

AWS	Air/Water Separator
BTEX	Benzene, Toluene, Ethylbenzene, Total Xylenes
BTEXMN	Benzene, Toluene, Ethylbenzene, Total Xylenes, MtBE, and Naphthalene
CAC	Corrective Action Contractor
CAD/GIS	Computer aided design/Geographic information systems
CABMR	Corrective Action Baseline Monitoring Report
CACMR	Corrective Action Closure Monitoring Report
CAMR	Corrective Action Monitoring Report
CAMR-ab	Corrective Action Monitoring Report with as-built diagrams
CAP	Corrective Action Plan
CAS	Corrective Action System
CASDR	Corrective Action System Down Report
CASFL	Corrective Action System Field Log
CASIACL	Corrective Action System Installation and Activation Check List
CASRL	Corrective Action System Repair Log
CAT	Corrective Action Technology
CFM	Cubic feet per minute
CGI	Combustible Gas Indicator
CMR	Closure Monitoring Report
COC	Chemical of Concern
CSM	Conceptual Site Model
DRO	Diesel Range Organics
DMR	Discharge Monitoring Report
EDB	1,2-Dibromoethane
EDC	1,2-Dichlorethane
EPA	United States Environmental Protection Agency
FID	Flame Ionization Detector
FP	Free product
FP-HMR	Free Product – Hazard Management Report
FPIP	Free Product Investigation Plan
FPIR	Free Product Investigation Report
FPRP	Free Product Recovery Plan
FRG	Fund Reimbursement Guidance
GAC	Granular Activated Carbon
GPM	Gallons per minute
GRO	Gasoline Range Organics
GW	Groundwater
HDSS	High Density Soil Sampling
HNR	Hazard Notification Report
HRSC	High Resolution Site Characterization
IDW	Impacted Drinking Water
IDW-HNR	Impacted Drinking Water – Hazard Notification Report
IDW-HMR	Impacted Drinking Water – Hazard Management Report
IRHMR	Initial Response and Hazard Management Report

ISCR	Initial Site Characterization Report
ISL	Initial Screening Level
kW	Kilowatt
LEL	Lower Explosive Limit
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
MEME	Mobile Enhanced Multi-Phase Extraction
MSL	Mean Sea Level
MW	Monitoring Well
NEMA	National Electric Manufacturers' Association
NOD	Notice of Deficiency
NOV	Notice of Violation
NPDES	National Pollution Discharge Elimination System
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OSLRP	Oil Sealed Liquid Ring Pump
OVD	Organic Vapor Detector
OVS	Oil/Water Separator
PAH	Polycyclic Aromatic Hydrocarbon
PCA	Permanent Closure Application
PCR	Permanent Closure Report
PID	Photoionization detector
PM	Performance Measure
POTW	Publicly Owned Treatment Works
ppm	Parts Per Million
PSI	Pounds Per Square Inch
PVI	Petroleum Vapor Impact
PVI-HMR	Petroleum Vapor Impact - Hazard Management Report
QA/QC	Quality Assurance and Quality Control
RAR	Risk Analysis Report
RBCL	Risk-Based Cleanup Level
RDC	Remedial Design Characterization
RMR	Risk Monitoring Report
RW	Recovery Well
SCR	Site Check Report
SGS	Soil Gas Survey
SSCL	Site specific Cleanup Level
SVE	Soil Vapor Extraction
Task	Reimbursement Task
TCA	Tennessee Code Annotated
TCLP	Toxicity Characteristic Leaching Procedure
TDEC	Tennessee Department of Environment and Conservation
TRBCA	Tennessee Risk-Based Corrective Action
UEL	Upper Explosive Limit
UST	Underground Storage Tank

E. Definitions

For the purposes of this manual only, the following definitions apply:

“Aboveground release” means any release to the surface of the land or to surface water. This includes, but is not limited to, releases from the aboveground portion of a UST system and aboveground releases associated with overfills and transfer operations as the petroleum moves to or from a UST system.

“Bedrock” means any rock, solid and continuous, which is exposed at the surface of the earth or overlain by unconsolidated material.

“Belowground release” means any release to the subsurface of the land or to groundwater. This includes, but is not limited to, releases from the belowground portions of an underground storage tank system and belowground releases associated with overfills and transfer operations as the petroleum moves to or from an underground storage tank.

“Beneath the surface of the ground” means beneath the ground surface or otherwise covered with earthen materials.

“Chemicals of concern” (COC) means those chemicals that have been designated as such by the Division in a chemicals of concern list. The chemicals of concern shall be chemicals that are constituents of or result from the degradation of petroleum product(s) and/or additives released from regulated petroleum underground storage tanks. The list will include those chemicals with the highest risk to human health or the environment. The chemicals of concern for diesel fuel will be different from the chemicals of concern for gasoline. See [Table 1-1 Chemicals of Concern](#).

“Combustible Gas Indicator” (CGI) is an instrument used to sample the atmosphere to indicate if any flammable (combustible) vapors/gases are present, determine the composition of hydrocarbon gas and air mixtures, and indicate the concentration of vapor/gas present in the atmosphere as a percentage of the lower explosive (flammable) limit (LEL). A CGI shall be calibrated in accordance with the manufacture’s specifications.

“Conceptual Site Model” (CSM) is a written and/or illustrative representation of site conditions that conveys what is known or suspected about the sources, releases and release mechanisms, contaminant fate and transport, exposure pathways, potential receptors, and risks. The conceptual site model is based

on the information available at any given point in time and will evolve as more information becomes available.

“Confined Space” means a space that has limited or restricted means of entry or exit; is large enough for a person to enter and is not designed for continuous occupancy. These spaces may include, but are not limited to, underground vaults, tanks, storage bins, pits and diked areas, vessels, sewers and silos.

“Connected piping” means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which petroleum flows. For the purpose of determining how much piping is connected to any individual UST system, the piping that joins two UST systems should be allocated equally between them

“Corrective action” means any activity, including but not limited to evaluation, planning, design, engineering, construction, and any ancillary service, which is carried out in response to any discharge or release of petroleum.

“Corrective action contractor” or “CAC” means a person who is carrying out any corrective action, including a person retained or hired by such person to provide services relating to a corrective action.

“Date of release” means the earliest date that proof of a release exists. This will be the date a release is reported to or discovered by the Division unless an earlier date is determined during the investigation of the release.

“De minimis” means very low concentrations of petroleum.

“Deductible” is the entry level or amount of financial responsibility that must be expended as approved costs by the responsible party prior to any reimbursement of eligible expenses. All fund eligible releases that occur on or after April 9, 2026, will be entitled to reimbursement from the fund with a maximum deductible of \$5,000. The deductible may be decreased up to 100%, so that there is no deductible, if certain criteria have been met.

“Director” means the director of the Division.

“Dispenser” means equipment located aboveground that dispenses petroleum products from underground storage tank systems.

“Dispenser system” means the dispenser and the equipment necessary to connect the dispenser to the underground storage tank system including the flex connector and shear valves.

"Division" means the division designated by the Commissioner as the agency to implement the Underground Storage Tank Program in Tennessee.

"Document" means any recorded information regardless of its physical form or characteristics, including, but not limited to, written or printed material; processing cards and tapes; maps; charts; paintings; drawings; engravings; sketches; working papers and notes; reproductions of such things by any means or process; and sound, voice, or electronic recordings in any form.

"Drinking water supply" means any aquifer or water source whose chemical characteristics meet the primary and secondary drinking water standards as defined under Chapter 0400-45-01 and that provides a yield of at least one-half gallon per minute. Drinking water supply shall also include any water supply used for drinking by the citizens of the state.

"Engineering control" means a modification to a site to reduce or eliminate the potential for migration of, and exposure to, chemicals of concern. An engineering control can be used to eliminate a pathway to reduce future risk. Engineering controls may include, but are not limited to: physical or hydraulic control measures, caps, liners, point-of-use treatments, slurry walls or vapor barriers.

"EPH" means Extractable Petroleum Hydrocarbons (effective May 1, 1998, and replaced the DRO Method). EPH has no SSCL, RBCL, or ISL as it is utilized as a "soil screening" mechanism only for the potential installation of a monitoring well for UST tank closure and site check activities. EPH above the detection limit is considered a suspected release.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the UST system is placed at the time of installation.

"Explosion/Fire Hazard" means any situation where the petroleum vapor concentrations are greater than, or equal to, 10% of the lower explosive limit or are between the upper and lower flammable limits as defined below. Dangerous levels are considered to be any concentration greater than or equal to 10% of the lower explosive limit.

"Explosive Limits" means any concentration that is greater than, or equal to, 10% of the lower explosive limit.

"Exposure pathway" means the course a chemical(s) of concern takes from a source area(s) to a receptor. Each exposure pathway includes a source area(s), a point of exposure, and an exposure route, and usually a transport/exposure medium or media.

“Extension Request” means a written request that justifies the reason(s) why a required document (e.g. report, application) will not be submitted by the deadline previously established by the Division. An extension is not automatic, multiple requests will not be approved, and enforcement actions may be taken to ensure prompt compliance with established deadlines.

“Flammable” means a material which is easily ignited and burns with extreme rapidity. The two primary measures of this physical hazard are the flashpoint and the autoignition temperature. For specific information on the definition and test methods of flammable materials, refer to 29 CFR 1910.1200. Flammability is the ability of a material to generate a sufficient concentration of combustible vapors to be ignited and is bounded by the upper flammable limit and the lower flammable limit.

“Free product” refers to petroleum that is present as a nonaqueous phase liquid (that is, liquid not dissolved in water).

“Free Product Initial Discovery” means the discovery of free product not previously observed in observation, monitoring, or recovery well(s), on surface water, on ground surface, in excavation(s), in a basement, confined space or utility. An increase of free product greater than one (1) foot above previous measurements in any type of well shall be considered an initial discovery and shall be reported to the Division within seventy-two (72) hours.

“Free Product Initial Response” is the preliminary response activities taken to control the migration of free product associated with recent release(s) or the initial discovery of free product. Initial response activities may include, but not be limited to, the free product abatement and/or removal methods

“Free Product Removal Methods” include methods and equipment used in a well, surface water, or on the surface of the ground, excavation zone, or subsurface structure that is capable of free product removal. The methods and equipment shall be appropriately selected to be cost effective, prevent migration, and maximize recovery based on the anticipated or known quantity of product, type of product released, and the ability of the impacted matrix to yield the product.

“Fund” means the petroleum underground storage tank fund established under T.C.A. §§ 68-215-101 et seq. unless the context clearly indicates otherwise.

“Groundwater” means water below the land surface in a zone of saturation.

“Guidance” means written guidelines and/or guidance documents provided by the Division. Such guidance provides information and instruction for achieving regulatory compliance. Other approaches to achieving regulatory compliance may be used in lieu of guidance provided by the Division, if those other approaches are proposed, in writing, by tank owners and/or operators for review and approval by the Division prior to implementation.

“Impacted drinking water” (IDW) means a water supply that contains chemicals of concern at levels that do or potentially may place human health at risk and that is being used for human consumption, and/or other human domestic use including, but not limited to, bathing, cooking, and dishwashing.

“Information” means knowledge which can be communicated by any means.

“Initial Screening Level (ISL)” means the concentration of a COC in soil or groundwater that were calculated using conservative assumptions and default parameters. The ISLs are to be utilized for suspected petroleum releases pursuant to 0400-18-01-.05 (i.e. Site Check) or 0400-18-01-.07 (i.e. UST system closure) to determine if further assessment and/or corrective action is warranted. See [Table 1-2 Initial Screening Levels](#).

“Institutional control” means a legal means of limiting exposure to chemicals of concern at a petroleum site with a confirmed release of petroleum.

“Intermittent or Recurring Free Product” is free product which returns to previously impacted locations (observation, monitoring, recovery well(s), on surface water, on ground surface, in excavation(s), in a basement, confined space, and/or in utilities) at a thickness of less than one (1) foot.

“Lower Explosive Limit (LEL) or Lower Flammable Limit (LFL)” means the lowest concentration of a substance in air (usually expressed in percent by volume) that will produce a flash or fire when an ignition source (e.g., heat, electric, arc, or flame) is present. At concentrations lower than the LEL, propagation of a flame will not occur in the presence of an ignition source.

“Man-made pathways” means constructed physical conditions that may allow for the transport of regulated substances including, but not limited to, sewers, utility lines, utility or elevator vaults, building foundations, basements (including earthen floors), crawlspaces, drainage ditches, previously excavated and filled areas, or sumps.

“Mobile Enhanced Multi-phase Extraction (MEME) is either an eight (8) or twenty-four (24) hour high vacuum extraction event. An 8-hr MEME event is generally utilized for free product recovery from an observation well or other site-specific reason. A 24-hr MEME event is generally utilized for free product

abatement, collection of data for corrective action system design criteria, or as an interim abatement measure. Monitoring and/or recovery wells are generally utilized for 24-hr events with SVEs utilized on occasion.

"Month" means from the first day to the last day of the calendar month. For reimbursement purposes, a monthly charge shall be utilized once monthly charges are more cost effective than weekly.

"Monthly" means at least once during a calendar month.

"Maximum Workday" is the allowable maximum number of hours/day that reimbursement may be claimed for any task. Ten (10) hours is the maximum time unless written approval is obtained from the Division project manager in advance of conducting the work. This excludes tasks 2.4.e and any lump sum task.

"Markup" means the allowable markup for specific items outlined in the Fund Reimbursement Guidance. For most items, this is 10% not to exceed listed maximum cost/rates. A 5% markup continues to be allowed for disposal and treatment of soil, water, free product, etc. For tasks that are short term and/or single events and generally greater than \$25,000 (i.e. advanced site characterization technologies or corrective action material injection/application) a 5% markup is applicable. For the short term and/or single event tasks, markup on mobilization and demobilization are not reimbursable.

"Occurrence" means the discovery of environmental contamination at a specific time and date, due to the release of petroleum products from petroleum underground storage tanks;

"Off-site" is any location outside the area of known petroleum contaminated soil and/or groundwater. This location may be either inside or outside the facility property boundary.

"Off-site Site-Specific Cleanup Level (Off-site SSCL)" is the cleanup level, calculated with site specific data, for an individual COC that is calculated using the Domenico (groundwater flow) Fate and Transport model to be protective of human health and/or the environment at an off-site receptor.

"On-site" is any location within the area of known petroleum contaminated soil and/or groundwater. This location may be either inside or outside the facility property boundary. As the contaminant plume shrinks, a receptor that was once on-site may become off-site. If this situation occurs before cleanup levels are reached, then notify the Division case manager. The case manager may require a revised Risk Analysis Report (RAR) based on current data.

"On-site Site-Specific Cleanup Level (On-site SSCL)" is the cleanup level, calculated utilizing ASTM Designation:E1739-95 (reapproved 2015; withdrawn 2024) with site-specific data, for an individual COC to be protective of human health and/or the environment to an on-site receptor.

"Operator" means any person in control of, or having responsibility for, the daily operation of the petroleum underground storage tank

"Overfill release" is a release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the petroleum to the environment.

"Owner" means:

(A) For petroleum storage tanks in use or brought into use on or after November 8, 1984, any person who owns a petroleum underground storage tank used for the storage, use, or dispensing of petroleum products;

(B) For petroleum underground storage tanks used prior to November 8, 1984, but no longer in use after that date, the person who last owned the petroleum underground storage tank used for storage, use, or dispensing of petroleum immediately before discontinuation of its use;

"Owner or operator," in the context of financial responsibility, when the owner or operator are separate parties, refers to the party that is obtaining or has obtained financial assurances.

"Person" means any and all persons, including individuals, firms, partnerships, associations, public or private institutions, state and federal agencies, municipalities or political subdivisions, or officers thereof, departments, agencies or instrumentalities, or public or private corporations or officers thereof, organized or existing under the laws of this or any other state or country.

"Petroleum" means any crude oil or any fraction of crude oil which is a liquid at standard temperature and pressure (sixty degrees Fahrenheit (60° F) and fourteen and seven-tenths pounds per square inch (14.7 p.s.i.) absolute). The term petroleum includes but is not limited to petroleum and petroleum based substances comprised of a complex blend of hydrocarbons, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

"Petroleum underground storage tank" means any one (1) or combination of tanks (including the underground lines connected thereto) which are used or have been used to contain an accumulation of petroleum substances, and the volume of which (including the volume of the underground pipes connected

thereto) is ten percent (10%) or more beneath the surface of the ground. "Petroleum underground storage tank" does not include any tank exempted from this chapter pursuant to § 68-215-124

"Proof of payment" means acceptable evidence that the invoices included in the initial reimbursement application(s) indicates that the deductible has been paid. The acceptable methods include either copies of canceled checks or affidavits (CAC Certification page) signed by the contractors stating they have received payment.

"Petroleum underground storage tank fund" means the fund established by this chapter to provide for the cleanup of releases from petroleum underground storage tanks and assist with the financial responsibilities of owners/operators of petroleum underground storage tanks

"Petroleum Vapor Hazard" means the presence of petroleum vapors as detected by an OVD [concentrations > one hundred (100) ppm].

"Petroleum Vapor Impact (PVI)" means the presence of petroleum vapors as detected by an OVD [concentrations > ten (10) parts per million (ppm)], any detectable CGI reading, or olfactory senses

"Pipe" or "piping" means a hollow cylinder or tubular conduit that is constructed of nonferrous materials.

"Property improvements" in the context of fund reimbursement includes, but is not limited to, petroleum dispensing equipment, canopies, signage, buildings and outbuildings, underground storage tanks, asphalt, and concrete

"Polycyclic Aromatic Hydrocarbons (PAHs)" are specific PAHs that the Division has included as COCs to evaluate risk to human health and/or the environment.

"Pathway" is the course a COC takes from the source area to an exposed organism. Each exposure pathway includes a source, a point of exposure, and an exposure route.

"Point of Exposure" is the point(s) at which an individual or population may or have come in contact with a COC originating from the petroleum release. The distance from the on-site contamination to the off-site receptor will be measured during Fate and Transport modeling.

"Reasonable cost" means that monetary amount or range, as determined by the Division, to be commensurate with a corrective action. The Division's determination is based on an evaluation of typical costs expected for the

particular corrective action under review considering the scope and complexity of the activities involved and/or hourly rates which are competitive among approved corrective action contractors.

“Receptor” means a person, structure, surface water body, or drinking water supply that receives or may potentially receive exposure to a COC as the result of a petroleum release.

“Release” means any spilling, overfilling, leaking, emitting, discharging, escaping, leaching, or disposing of a petroleum substance from a UST including its associated piping, into groundwater, surface water, or subsurface soils.

“Repair” means:

1. In the context of UST system operation, to restore to proper operating condition a tank or pipe, spill prevention equipment, overfill prevention equipment, corrosion protection equipment, release detection equipment, or other UST system component that has caused the release of petroleum from the UST system or has failed to function properly;
2. In the context of replacement of piping on or after July 24, 2007, restoration of a portion of piping in lieu of replacement of an entire piping run authorized by the division in writing; or
3. In the context of fund eligibility of property improvements, restoration of a property improvement to the position and condition it was in immediately prior to removal for the purpose of remediation of the contamination caused by a leaking petroleum underground storage tank system

“Responsible party” means:

- (i) The owner and/or operator of a petroleum site;
- (ii) Any person who at the time of the release which caused the contamination was an owner and/or operator of a petroleum underground storage tank;
- (iii) Any person whose intentional actions directly cause the release of petroleum at a petroleum site; or
- (iv) Any person other than an employee, officer, director, principal, or shareholder of the owner or operator of the underground storage tank system or of the owner of the petroleum site, whose negligent actions directly cause the release of petroleum at a petroleum site; or

A responsible party does not include a unit of state or local government which becomes an owner or operator of a petroleum site by acquiring ownership or control through bankruptcy, tax delinquency, abandonment, or other circumstances in which the government

acquires title by virtue of its function as sovereign, unless such governmental entity has otherwise owned or operated a petroleum underground storage tank on the site or has caused or contributed to the release or threatened release from such a tank.

"Retraining" means any remedial training approach imposed by the Division when significant operational compliance violations are discovered at a facility. Retraining may include requirements to successfully complete additional education, testing, and/or training, or be subject to other administrative or enforcement options at the discretion of the Division.

"Risk Analysis" is the Division's exposure assessment methodology. The Risk Analysis process is achieved using a Risk Analysis Report.

"Risk-Based Cleanup Level" or "RBCL" means the lookup values for COCs in soil or groundwater that was calculated using conservative assumptions and default parameters. See [Table 1-3 Risk Based Cleanup Levels](#).

"Site-Specific Cleanup Level" or "SSCL" means the maximum calculated concentration of a COC in soil or groundwater in the source area(s) that do not pose an unacceptable risk at the point of exposure, based upon site-specific conditions and default parameters.

"Site Specific Impaired Groundwater" means groundwater that has been contaminated by human activity and the Tennessee Board of Water Quality, Oil, and Gas finds that either it is not technologically feasible to remediate the groundwater to the criteria required by other classifications or it is not reasonable to remediate to that criteria based on information provided in accordance with Division of Water Resources, General Water Quality Criteria, Rule 0400-40-03-.09.

"Soil Gas Survey" means an investigation to evaluate the completeness of the volatilization to indoor air pathway for sites that have completed a risk assessment, have SSCLs approved by the Division of Underground Storage Tanks (Division), and have soil and/or groundwater contaminant concentrations that exceed the approved SSCLs.

"Soil Gas Survey Expendable Probe Point" means a non-recoverable nylon or metal tip that is connected to rigid tubing and is left in place after the soil gas sample is collected.

"Soil Gas Survey Probe" means the subsurface portion of the vapor extraction device (including attached subsurface tubing) that is installed within the vadose zone for the primary purpose of obtaining a soil gas sample.

"Soil Gas Survey Retractable Probe Point" means a recoverable metal tip that is connected to a drive rod and is removed after the soil gas sample is collected.

"Soil Gas Survey Sample Train" means a device constructed of tubing, couplings, tees, and stopcocks that when assembled will connect the purge device and sample collection canister to the probe.

"Soil Gas Survey Tracer Compound" means Isopropanol (2-Propanol, 70 % rubbing alcohol)

"Source" means the source of contamination. Sources may include, but are not limited to, a leaking tank, a leaking underground storage tank system, a spill, an overfill, free product or residual contaminated soil or groundwater.

"Special Source Water" means groundwater or perched water with exceptional quality or quantity, which may serve as a valuable source for water supply or which is ecologically significant.

"Tank" means a stationary device, designed to contain an accumulation of petroleum substances which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, fiberglass) which provide structural support.

"Tennessee Petroleum Underground Storage Tank Act" is declared to be the public policy of the state of Tennessee to regulate underground storage tanks in order to protect the public health, safety and welfare, to prevent degradation of the environment, conserve natural resources and provide a coordinated statewide underground storage tank program.

"Temperature Blank" means a VOA vial or other small sample bottle filled with distilled water that is placed in a sample cooler to evaluate if the samples were adequately cooled during sample shipment. The laboratory will measure the temperature of this vial upon arrival.

"Trip Blank" means a clean sample of a matrix provided by the laboratory to assess contamination introduced during shipping and field handling procedures. The Trip Blank is typically analyzed only for VOCs.

"Unusable Groundwater" means groundwater in the following specified areas in accordance with Division of Water Resources, General Water Quality Criteria, Rule 0400-40-03-.07 -"High Dissolved Solids Zone", "Historical Injection Zone", "Class I Injection Zone", "Class II or III Injection Zone", and "Acid Production Zone from Mining Activities".

"Upper Explosive Limit (UEL) or Upper Flammable Limit (UFL)" means the highest concentration of a vapor or gas (highest percentage of the substance in air) that will produce a flash or fire when an ignition source (e.g., heat, electric, arc, or flame) is present. At higher vapor concentrations, the mixture is too "rich" to produce a flash or fire.

"UST system" or "tank system" means an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any

"Waters" means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through or border upon Tennessee or any portion thereof except those bodies of water confined to, and retained within, the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.

"Week" means any seven day period, provided that days run consecutively. For reimbursement purposes, a weekly cost should be utilized when a weekly rate is more cost effective than total of the daily rates.

"Weekly" in the context of manual tank gauging, means once per week, resulting in a minimum of four weekly tests per month.

"Week of rental equipment" mean equipment that is rented for three (3) to seven (7) consecutive days.

Table 1-1 Chemicals of Concern (COCs)

		EPA Method 8260B								EDB (EPA Method 8011)	EPA Method 8270C SIM ² or EPA Method 8310 ²																EPA Method 200.7 ²					EPH ¹ (TN EPH Method)
Matrix	Product(s)	Benzene	Toluene	Ethylbenzene	Total Xylenes	MtBE	Naphthalene	EDC	EDB		Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Cadmium	Total Chromium	Total Lead	Silver	Zinc	
Soil	Gasoline	X	X	X	X	X	X																									
	Diesel, Kerosene, Jet Fuel	X	X	X	X	X	X																									X
	Waste Oil						X																									X
	Aviation Fuel	X	X	X	X	X	X	X	X																							X
	Unknown	X	X	X	X	X	X	X	X																							X
Groundwater and Surface Water (Drinking Water Use or Undetermined ³)	Gasoline	X	X	X	X	X	X																									
	Diesel, Kerosene, Jet Fuel	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
	Waste Oil						X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Aviation Fuel	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X			
	Unknown	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Groundwater (Non-Drinking Water Use)	Gasoline	X	X	X	X	X	X																									
	Diesel, Kerosene, Jet Fuel	X	X	X	X	X	X																									
	Waste Oil						X																									
	Aviation Fuel	X	X	X	X	X	X	X	X																							
	Unknown	X	X	X	X	X	X	X	X																							
Surface Water (Non-Drinking Water Use) ⁴	Gasoline	X	X	X																												
	Diesel, Kerosene, Jet Fuel	X	X	X							X		X	X	X	X		X	X	X	X	X	X			X						
	Waste Oil										X		X	X	X	X		X	X	X	X	X	X			X						
	Aviation Fuel	X	X	X				X			X		X	X	X	X		X	X	X	X	X	X			X						
	Unknown	X	X	X				X			X		X	X	X	X		X	X	X	X	X	X			X						

1 - To be included for soil samples prior to release investigation (IRHMR/ISCR)
2 - PAH and metal samples shall be field filtered using a 0.45 micron filter
3 - All groundwater samples collected prior to approval of site-specific cleanup levels shall be analyzed for “Undetermined” water use
4 - If surface water is within 0.1 mile from UST contamination/site then groundwater shall also include modified PAHs for anything other than gasoline

Initial Screening Levels, Risk-Based Cleanup Levels, and Site-Specific Cleanup Levels

Initial Screening Levels (ISLs)

These are generally applicable to projects being assessed in accordance with Rules 0400-18-01-.05, 0400-18-01-.07, and 0400-18-01-.09 (i.e. specifically related to previously unregistered and those addressed by Rule 0400-18-01-.14).

The commercial ISLs for soil shall only be utilized if:

- the subject property is commercial use, and
- adjacent properties are commercial or the extent to residential ISLs have been delineated in the direction of the residential property/properties (i.e. the contamination above residential ISLs are confirmed not to extend to the residential property/properties).

There may be exceptions, that the Division shall be contacted to determine applicability. These exceptions include, but are not limited to:

- A previous contamination case was closed under the previous cleanup levels established by Rules with effective dates of April 15, 1990 through October 24, 2005.
- Site-Specific Cleanup Levels were previously approved. For this scenario, the following must be evaluated to determine if the previously approved SSCLs are valid:
 - Type of petroleum releases previously and currently.
 - The depth of soil utilized for soil SSCLs.
 - The depth of wells and depth to water, confirming the same subsurface water was assessed.
 - The previous receptors with respect to current receptors, note that an updated water use and receptor survey or receptor monitoring may be necessary to confirm no changes.
 - The COCs that a SSCL was established for previously, as this relates to the type of petroleum released taking into consideration the receptors.
 - Correct parameters, including soil type or values used related to soils.

Risk-Based Cleanup Levels

For a site that a release has been confirmed, implementation of Rule 0400-18-01-.06 is required, and an IRHMR and ISCR has been required, then the Risk-Based Cleanup Levels (RBCLs) should be utilized to map and delineate contaminant plume(s), which may include interpolation and/or extrapolation, for source widths required for the RAR. The Exposure Assessment has been integrated into the IRHMR and ISCR requirements, and unless specifically requested, a separate Exposure Assessment Report shall not be submitted.

Site-Specific Cleanup Levels

Once SSCLs have been established following an Exposure Assessment, which is integrated into the IRHMR and ISCR, the approved SSCLs are applicable for an ongoing contamination project unless:

- A new release occurs that the SSCLs are not deemed applicable,
- The receptors change, or
- The approved SSCL was driven by off-site SSCL calculation and the source width(s) changed.
- Additional information is obtained that would affect the calculated SSCLs.

Evaluation of the approved SSCLs shall be conducted:

- As part of a CAS Performance Evaluation Meeting for sites where corrective action is ongoing,
- During preparation of a CAP if corrective action has not been implemented within two (2) years of SSCL approval, and
- Any other time as deemed necessary.

Table 1-2 Initial Screening Levels

CHEMICALS OF CONCERN	Subsurface Soil		Groundwater	
	Residential (ppm)	Commercial (ppm)	Drinking Water or Undetermined (ppm)	Non-Drinking Water (ppm)
*EPH	500	500	NA	NA
Benzene	0.0729	3.80	0.005	0.072
Toluene	6.78	62.2	1	4.31
Ethylbenzene	143	1310	0.7	10.3
Xylenes (Total)	9.60	88.0	10	3.57
Methyl-tert-butyl-ether (MtBE)	39.6	364	0.02	175
Acenaphthene	NA	NA	0.939	NA
Acenaphthylene	NA	NA	0.939	NA
Anthracene	NA	NA	0.0434	NA
Benzo(a)anthracene	NA	NA	0.00117	NA
Benzo(a)pyrene	NA	NA	0.0002	NA
Benzo(b)fluoranthene	NA	NA	0.00117	NA
Benzo(g,h,i)perylene	NA	NA	0.0007	NA
Benzo(k)fluoranthene	NA	NA	0.0008	NA
Chrysene	NA	NA	0.0016	NA
Dibenz(a,h)anthracene	NA	NA	0.000117	NA
Ethylene Dibromide (EDB)	0.18	1.05	0.00005	0.0855
Ethylene Dichloride (EDC)	0.00755	0.0166	0.005	0.0267
Fluoranthene	NA	NA	0.206	NA
Fluorene	NA	NA	0.626	NA
Indeno(1,2,3-c,d)pyrene	NA	NA	0.00117	NA
Naphthalene	135	403	0.02	9.81
Phenanthrene	NA	NA	0.469	NA
Pyrene	NA	NA	0.135	NA
Cadmium	NA	NA	0.005	NA
Chromium	NA	NA	0.1	NA
Lead	NA	NA	0.015	NA
Silver	NA	NA	0.1	NA
Zinc	NA	NA	5	NA

NA = Not Applicable

* EPH is used as a soil screening mechanism for the potential installation of a monitoring well only. For surface water, refer to General Water Quality Criteria Rule 0400-40-03-.03

Table 1-3 Risk-Based Cleanup Levels

Volatilization to Indoor Air				
CHEMICALS OF CONCERN	Subsurface Soil		Groundwater	
	Residential (ppm)	Commercial (ppm)	Residential (ppm)	Commercial (ppm)
Benzene	0.0729	3.80	0.072	0.375
Toluene	6.78	62.2	4.31	39.6
Ethylbenzene	143	1,310	10.3	94.8
Xylenes (Total)	9.6	88	3.57	32.7
MtBE	39.6	364	175	1,610
Acenaphthene	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA
EDB	0.18	1.05	0.0855	0.499
EDC	0.00755	0.0166	0.0267	0.0587
Fluoranthene	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	NA	NA	NA	NA
Naphthalene	135	403	9.81	31
Phenanthrene	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA
Chromium	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Silver	NA	NA	NA	<u>NA</u>
Zinc	NA	NA	NA	<u>NA</u>

Other Pathways or Points of Exposure			
CHEMICALS OF CONCERN	Groundwater	Surface Water	
	Ingestion (ppm)	Domestic Water Supply Use* (ppm)	Organisms Only Use** (ppm)
Benzene	0.005	0.005	0.51
Toluene	1	1	15
Ethylbenzene	0.7	0.7	2.1
Xylenes (Total)	10	10	NA
MtBE	0.02	NA	NA
Acenaphthene	0.939	NA	0.99
Acenaphthylene	0.939	NA	NA
Anthracene	0.0434	NA	40
Benzo(a)anthracene	0.00117	NA	0.00018
Benzo(a)pyrene	0.0002	0.0002	0.00018
Benzo(b)fluoranthene	0.00117	NA	0.00018
Benzo(g,h,i)perylene	0.0007	NA	NA
Benzo(k)fluoranthene	0.0008	NA	0.00018
Chrysene	0.0016	NA	0.00018
Dibenz(a,h)anthracene	0.000117	NA	0.00018
Ethylene Dibromide (EDB)	0.00005	0.00005	NA
Ethylene Dichloride (EDC)	0.005	0.005	0.37
Fluoranthene	0.206	NA	0.14
Fluorene	0.626	NA	5.3
Indeno(1,2,3-c,d)pyrene	0.00117	NA	0.00018
Naphthalene	0.02	NA	NA
Phenanthrene	0.469	NA	NA
Pyrene	0.135	NA	4
Cadmium	0.005	0.005	NA
Chromium	0.1	0.1	NA
Lead	0.015***	0.005	NA
Silver	0.1	NA	NA
Zinc	5	NA	NA

* General Water Quality Criteria – Rule 0400-40-03-.03(1)(j)

** General Water Quality Criteria – Rule 0400-40-03-.03(4)(j)

*** Lead is set at EPA action level

II. Guidance Related to Rule 0400-18-01-.02 UST Systems: Installation and Operation

Reserved

III. Guidance Related to Rule 0400-18-01-.03 Notification, Reporting, and Record Keeping

Reserved

IV. Guidance Related to Rule 0400-18-01-.04 Release Detection

Reserved

DRAFT

V.**Guidance Related to Rule 0400-18-01-.05 Release Reporting, Investigation, and Confirmation****A. Suspected Release Reporting**

Reporting of suspected releases shall be within 72 hours and can be submitted to Releases.UST@tn.gov including the following information:

- UST Facility ID
- Facility Name
- Contact
- Contact information
- Date and time of occurrence
- Date and time of response
- Provide a summary of the complaint, event and/or alarms that initiated the suspected release activities/actions.
- Provide all applicable documentation and photographs.
- Elaborate on actions taken to date as well as ongoing or planned activities.

All field screening results (i.e. OVD readings) greater than 0.0 ppm are considered a suspected release and shall be reported to the Division Project Manager within 72 hours.

B. UST System Testing

UST System testing results should be completed and results utilized in determining location of Site Check investigation soil borings and/or monitoring wells. If UST System testing information is not available to the Division at the time of approval of proposed boring locations, subsequent investigations may be required. If the release is determined to be reimbursable, the additional mobilization/demobilization may not be reimbursed.

C. Site Check Investigation of Environmental Impact (i.e. measure for the presence) of a Release

Site Check investigations will generally be related to a suspected or observed release from a UST system, a human health hazard that a source of petroleum impact has not been identified or confirmed, or a combination thereof. The location of soil borings and/or monitoring well(s) for each investigation are specified below. Contact the Division's project manager prior to field activities to confirm planned location of soil borings and/or monitoring wells are deemed adequate. If potential preferential pathways, such as utilities or other underground conduits are present, additional borings should be installed. Any variation shall be discussed and approval obtained prior to field activities.

1. Types of Investigations of Environmental Impact

a. UST System Release Investigation

If release detection, UST system testing, or visual observations indicate a release to the environment did or could have occurred, then the investigation activities shall focus on the area most likely impacted.

Soil borings shall be advanced around the UST system component/equipment that a release occurred or is suspected. Below are examples of component specific boring requirements if not specifically addressed in Division correspondence. Investigation activities should be focused on where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and/or operators must consider the nature of the stored petroleum, the type of initial alarm or cause for suspicion, the type of backfill, the depth of groundwater, and other factors appropriate for identifying the presence and source of the release.

Examples for typical component releases:

- Tank/compartiment tightness failure or leak observed within an uncontained STP: Borings shall be advanced no more than three (3) feet from tankhold. Borings shall be placed every 15 feet surrounding the tankhold. More specific requirements for tankhold borings, such as depth, are detailed in [section VI.B.4.a. Tankhold Borings](#).
- Line tightness failure with unknown cause or location: the soil borings shall be advanced no more than three (3) feet from the line trench and extend every 15 feet along the line trench. At least one boring at each end of the line shall be advanced, as well as at location(s) where the direction of the line changes (i.e. elbows, unions, etc.). More specific requirements for line trench borings, such as depth are detailed in [section VI.B.4.b. Dispenser Borings](#) and [section VI.B.4.c. Product Line Borings](#).
- Line tightness failure with known location of failure: one (1) boring at the location of suspected release, one (1) boring along the piping trench 15 feet from the release point toward the tankhold, and one (1) boring along the piping trench 15 feet in the opposite direction of tankhold if the

pipings trench extends beyond the release point. More specific requirements for line trench borings, such as depth, are detailed in [section VI.B.4.b](#). Dispenser Borings and [section VI.B.4.c](#). Product Line Borings.

- Dispenser leak: one (1) boring no more than three (3) feet from the dispenser and one (1) boring along the piping trench at a distance of 15 feet from the dispenser toward the tankhold, and if applicable one (1) boring along the piping trench at a distance of 15 feet from the dispenser in the opposite direction of the tankhold if the piping trench extends to additional dispensers. More specific requirements for dispenser and/or line trench borings, such as depth, are detailed in [section VI.B.4.b](#) Dispenser Borings and [section VI.B.4.c](#). Product Line Borings.

For a UST system release investigation, a monitoring well is required to be installed if:

- Water and/or free product is encountered in any boring, then a monitoring well shall be installed in the boring location where the highest OVD reading was recorded, free product was identified or water was encountered.
- Bedrock is encountered prior to the target depth or revised total depth based on OVD readings of any/all soil boring(s).
- Soil contamination is above the applicable level (see [Table 1-2 Initial Screening Levels](#)).
- TN EPH in soil exceeds 500 ppm.

If groundwater samples from the monitoring well(s) exceed the "Drinking Water or Undetermined Groundwater ISL", then a water use survey shall be conducted.

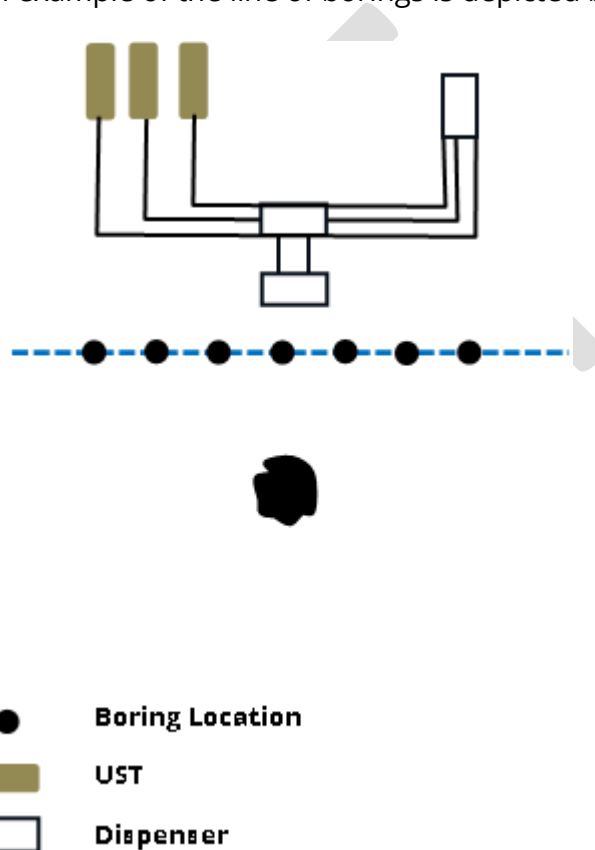
b. Hazard Investigation (if source of impact is unknown)

If a human health hazard such as impacted drinking water, petroleum vapor, free product and/or other hazards has been reported and the source is unknown, then investigation activities will be required at UST facilities in the area to determine the source.

Soil borings shall be placed in a line extending to the outer limits of the UST system at approximately 10 feet from the closest portion of the UST system in the direction of the identified hazard. Borings shall be at a distance of 15 feet from each other. Borings shall be advanced to a depth of fifteen (15) feet, at the zone of saturation, or at the soil/bedrock interface,

whichever occurs first. If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample, and the OVD readings for the bottommost sample indicates petroleum contaminant levels in excess of contamination identified in shallower intervals for that boring, then the boring depth may be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

An example of the line of borings is depicted below.



For this type of investigation, a monitoring well is required to be installed if:

- The hazard is a water supply well or other water hazard such as petroleum impacted groundwater or surface water. More specially if a surface water within 0.1 mile is visibly impacted by petroleum product including but not limited to: free product/sheen on the water, free product/sheen on the stream bank/sediment and/or release of product droplets from sediment when disturbed.
- Water is encountered in any boring, then a monitoring well shall be installed in the boring location where the highest

OVD reading was recorded, free product was identified or water was encountered.

- Bedrock is encountered prior to the target depth or revised total depth based on OVD readings of any/all soil boring(s).
- Soil contamination is above the applicable screening/cleanup level ([Table 1-2 Initial Screening Levels](#)).
- TN EPH in soil exceeds 500 ppm.

If groundwater samples from the monitoring well(s) exceed the "Drinking Water or Undetermined Groundwater ISL", then a water survey shall be conducted.

c. Combination Investigation (UST system release and hazard investigation)

If the Site Check Investigation is due to both a UST System release and a Hazard Investigation, then the planned borings and/or monitoring well locations shall be proposed in a map format and approved by the Division's project manager prior to field activities. Requirements from both investigation types shall be taken into consideration when providing the proposed investigation plan.

d. Other Investigation

In the event an excavation is conducted to access the UST system and obvious contamination is present or a surface impact has occurred, any obvious contamination shall be excavated and a soil sample collected for the applicable COCs. If soils are stockpiled, then samples shall be collected in accordance with [section VI.B.3.b](#) Soil Sampling Procedures.

If either the excavation soil sample or the stockpile soil sample is above ISLs or applicable cleanup levels then a monitoring well must be installed. More specifically, a release has been confirmed and all media shall be assessed.

D. Fund Eligibility Site Check

For any petroleum UST system that contained fuel and/or operated prior to registering the UST system, a fund eligibility site check is required. Additionally, UST systems specifically addressed in Rule 0400-18-01-.17 shall conduct a fund eligibility site check if not previously completed as required.

Both soil and groundwater shall be investigated for petroleum impact. Soil borings shall surround the entire UST system and spaced 15 feet apart, no further than three (3) feet from the tankhold and/or product line/component line trench. Borings shall be installed to a depth of 15 feet, at the zone of saturation, or at the soil/bedrock interface, whichever occurs first. If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample and the OVD reading for the bottommost sample indicates petroleum contaminant levels higher than identified in shallower intervals, then the boring depth shall be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

At least one monitoring well shall be installed in the area(s) determined to be most likely impacted based on all available information.

E. Implementation of Rule 0400-18-01-.06

If contaminated soils, contaminated groundwater, free product and/or petroleum vapors are discovered during the site check investigation or by any other manner, owners, operators, and/or other responsible parties shall begin release response and corrective action in accordance with Rule 0400-18-01-.06.

The owner, operator, and/or other responsible party of the petroleum UST system shall, unless directed to do otherwise by the Division, perform the following initial response actions:

- Report the release to the Division within 72 hours.
- Take immediate action to identify fire, explosion, and/or vapor hazards.
- Report any hazard to the Division within 72 hours and manage any hazards identified.
- Take immediate actions to prevent any further release of petroleum into the environment.
- Prevent further migration of the petroleum into surrounding soils and/or groundwater.

VI.**Guidance Related to Rule 0400-18-01-.06 Petroleum Release Response, Remediation, and Risk Management****A. Reporting of Confirmed Release**

If a confirmed release is being reported from a suspected release investigation (i.e. site check) or from a UST system closure, then report the confirmed release to the Division within 72 hours.

If a confirmed release is being reported from any other manner, such as a Phase II Environmental Site Assessment then submit via electronic mail to Releases.UST@tn.gov.

Analytical results for soil and/or groundwater that are detected above the Reporting Limit or Method Detection Limit where applicable (i.e. non-detect) for the applicable chemicals of concern is a confirmed release, even if it is below all ISLs.

B. Environmental Assessment, Monitoring, and/or Corrective Action Samples and Related Activities**1. Corrective Action Contractor and/or Subcontractor(s):**

Any variance to the Act, Rules, or these guidelines shall be approved prior to work, which may be required during field activities. These shall be explicitly documented in the appropriate section of the applicable report in addition to the approval. If approval was not obtained, the variances shall be explicitly documented, justification provided, and all pertinent information provided.

All environmental assessment activities and evaluation of the subsurface investigation shall be overseen onsite by a registered professional geologist in accordance with the Tennessee Geologist Act (T.C.A. §62-36-101 et seq.) or onsite registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (T.C.A. §62-2-101 et seq.).

Prior to any subsurface investigation, all aboveground and underground utilities, storage tanks, and lines shall be identified to prevent accidental damage. For reimbursable projects, a private utility locate will be allowed once per release, unless justification is provided otherwise. For boring and monitoring well clearance, these associated activities are included in the maximum per foot rate and for tasks without established rates, the proposal shall include related costs within the format required.

The CAC is responsible for ensuring the staff or subcontractors conducting the work is the appropriate personnel that has established and maintains competency of the task(s) being conducted as well as the related federal, state, and local requirements including the related portions of the Act, Rules, and guidelines. TDEC-UST does not reimburse for in the field training of CAC personnel or subcontractors unless approved by the Division in writing.

a. Documentation and Records

Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs for each site. A copy of the original field documentation shall be provided in each report. For example, if a CASFL is completed in paper format, then the original field documentation shall be scanned and submitted with the applicable report. If an electronic version is also submitted, both the field log and the electronic version shall be submitted in the applicable report.

Any field notes or logs should include the following information at a minimum:

- Date
- Site name, location, and facility ID
- Description of weather conditions
- Name of personnel onsite
- Sample IDs, type, location, depth, and time of collection.
- Quality control sample identification and actual location of sample (duplicate samples).
- If applicable, documentation as to why the tasks deviated from the requirements (i.e. federal, state, local, TDEC-UST Act, TDEC-UST Rules, and/or TDEC-UST guidelines).

i. Paper and Electronic Documentation

Paper documentation shall be written legibly and in ink.

- Observations, data collection, and calculations must be recorded at the time they are made or performed.
- Entries shall be dated and signed.
- Data or other information that has been documented incorrectly shall only be corrected using a single strike-through with the date and initials of

the person making the correction. No data shall be erased, redacted/obscured, or made illegible.

- If any additions are made to any field notes following completion of the field activity, then documentation of date, time and the person adding information shall be included with an explanation as to why additions are made.

If electronic documentation is created (more specifically no paper documentation was created) then:

- Observations, data collection, and calculations will be recorded at the time they are made or performed.
- Electronic files should contain an electronic signature and date stamp.
- Changes or corrections made to electronic files (e.g., spreadsheets, pdf documents, etc.) shall be documented in a comment section with the date and the initials of the person making the change.
- Electronic data shall not be deleted or redacted unless documented.
- If any additions are made to any field notes following completion of the field activity, then documentation of date, time and the person adding information shall be included with an explanation as to why additions are made.

2. Laboratory

Laboratories utilized for sample analysis shall have current National Environmental Laboratory Accreditation Program (NELAP) certification for the laboratory methods required by these guidelines. The RP and/or CAC is responsible for ensuring the laboratory utilized has obtained NELAP accreditation prior to sample collection. For laboratory analysis, all requirements specified in the Rules and these guidelines shall be met as well as the laboratory method requirements as established by the United States Environmental Protection Agency (EPA) or other method that has been approved by the Division prior to analysis.

METHOD	ANALYSIS	EQUIPMENT
SW-846 8260B	VOC	GC / Mass Spec*
TN-EPH	EPH	GC / FID*
SW-846 8310	PAH	HPLC*
SW-846 8011	EDB	GC / ECD*
SW-846 8270C SIM	PAH	GC / Mass Spec*
TO-15	VOC	GC / Mass Spec*

* -including using the auto sampler and related sample handling equipment, and all sample manipulations including extractions/digestions

In the event a public water system well is sampled for drinking water methods, the laboratory must have TDEC Division of Water Resources Laboratory Certification Program accreditation found at the following link: [TDEC-DWR Laboratory Certification Program](#).

Note that the related drinking water methods are not included with this guidance and shall be addressed on a site-specific basis as coordination and/or collaboration with the public water system and TDEC Division of Water Resources will be necessary.

a. Laboratory Analytical Reports

Commercial laboratory analytical reports shall provide the following at a minimum:

- The TN UST Facility ID Number;
- Sample location (including depth if applicable);
- Date and time sample was collected;
- Date and time sample analyzed;
- Laboratory analyst name
- Parameter (i.e., the appropriate COC);
- Parameter analytical results (report non-detect values as less than detection limits including the actual detection limit);
- Dilution factor;
- Unit of measurement ppm;
- Analytical method; and,
- Quality control analysis including blanks, duplicates, and matrix spikes

- Authorized laboratory signature as well as chain of custody, and
- Data quality flags including a narrative detailing the associated problems

3. Excavated Material Screening, Sampling and Reporting

If practical, obviously contaminated soil, as determined by visual observations, olfactory observations or OVD readings, should be segregated. Each soil stockpile shall be sampled in accordance with the following guidelines (i.e. each stockpile shall be screened and sampled separately).

Discrete soil samples shall be obtained from excavated material to determine if treatment is required. If excavation is occurring as a corrective action measure, more specifically previous confirmatory samples were collected from excavations and found to be above the applicable screening or cleanup level, then additional stockpile samples are not required from over excavated material unless necessary for treatment/disposal.

a. Field Screening Procedures

The total volume of excavated material (in cubic yards) from each stockpile shall be determined and divided by ten (10). The result of this calculation represents the total number of discrete samples to be collected for field screening. If this result is not a whole number, then round up to the next whole number. Field screening shall be performed as noted below.

- Sampling points shall be evenly distributed throughout the entire volume of the stockpiled material. The samples collected for field screening shall be representative samples based on volume rather than area.
- All samples shall be collected from various depths of the excavated material to ensure that undue volatilization of the petroleum constituents has not occurred. No samples shall be collected at a depth of less than 1 foot below the surface of the stockpile. Surficial samples are not acceptable.
- All screening results shall be included in the appropriate table and the sample(s) collected for analysis identified. All sampling locations shall be included on the

appropriate figure. The table and figure shall be included in the applicable report.

b. Soil Sampling Procedures

Samples shall be collected from the area(s) having the highest levels of contamination (i.e., the highest field screening results) for each stockpile. The number of sample(s) submitted for laboratory analysis shall be in accordance with the table provided below, for each stockpile. Soil sample analysis shall be in accordance with [Table 1-1 Chemicals of Concern](#).

Volume of each Soil Stockpile (cubic yards)	Number of Samples for Laboratory Analysis
0 – 60	1
60 - 240	2
240 – 480	3
480 - 720	4

Note: One additional sample shall be submitted for laboratory analysis for each additional 240 cubic yards of excavated material per stockpile.

c. Soil Disposal/Treatment Requirements

Soil disposal/treatment requirements shall be in accordance with the following:

- i. If the levels of petroleum contamination are below the residential ISLs, then soil disposal/treatment is not required and can be placed back in the excavated area.
- ii. Soils with contaminant concentrations exceeding the residential ISLs do not require disposal/treatment provided one of the following conditions is met:
 - If the levels of petroleum contamination exceed the residential ISLs but are below the commercial ISLs, then the referenced soil can be buried on the site of generation provided the referenced soil is capped with either asphalt, concrete, or a tightly packed three (3) foot thick layer of clean fill soil compacted to 98% of the maximum dry density and within +/- 3% of the optimum moisture content as determined by ASTM Method D698, and provided the referenced site is not currently a residential property and is not reasonably expected to be a residential property in the future. If a soil cap is utilized, then the elevation of the top of the soil cap should not be substantially

different than the elevation of the surrounding ground surface. This will help ensure that the integrity of the soil cap will not be compromised in the future.

- If the levels of petroleum contamination exceed the residential ISLs, but are below the site-specific cleanup level(s) for the petroleum constituent(s) previously approved by the Division, then the referenced soil can be buried on the site of generation provided the referenced soil is capped with either asphalt, concrete, or a tightly packed three (3) foot thick layer of clean fill soil compacted to 98% of the maximum dry density and within +/- 3% of the optimum moisture content as determined by ASTM Method D698. If a soil cap is utilized, then the elevation of the top of the soil cap should not be substantially different than the elevation of the surrounding ground surface. This will help ensure that the integrity of the soil cap will not be compromised in the future.

- iii. If the levels of petroleum contamination exceed the residential and/or commercial ISLs and the soil is to be transported to or treated on a different property/parcel regardless of ownership, then the Division of Land Protection - Waste Management Branch must be contacted for approval.

If soil treatment is required, then disposal or treatment shall be to the closest applicable facility (i.e. DSWM Type facility), or a cost comparison shall be provided. The permit application and approved permit shall be sent to the Division project manager upon submittal and/or receipt. Manifests shall be provided in the applicable report.

The Division no longer has pre-approved costs for treatment via on property/parcel aeration. If reimbursement from the fund will be sought, then a proposal and cost comparison of on property/parcel aeration or any other treatment shall be compared to disposal or treatment at a permitted facility. The cost comparison shall be provided and written approval obtained prior to conducting activities. This ensures the most cost effective and efficient method is utilized. If approved and additional costs are required then only up to the cost of the disposal or treatment at a permitted facility will be reimbursed,

any additional costs will be the responsible party or corrective action contractor's responsibility.

On property/parcel aeration treatment will not be considered if:

- The petroleum stored in the registered UST system included any fuel type other than gasoline.
- The treatment area is within a 100-year flood plain or wetland.
- The treatment area will be within 100 feet of any residence, business, or other place of human occupancy.
- The treatment area is located within a zoned area that the local Zoning Board has advised that it is not acceptable under the zoning requirements.
- The proposal does not protect the surrounding area from additional contamination. This includes an impermeable barrier (i.e. asphalt and concrete are not considered impermeable barriers), properly bermed, and covered with plastic to prevent surface runoff and spreading of contamination.
- The pile thickness will be greater than two (2) feet.
- The proposed treatment will damage the impermeable barrier.
- The proposed treatment does not specify treatment duration, treatment frequency, sampling frequency, etc.
- The treatment is shown to be less cost and time effective than disposal/treatment at a permitted facility.

d. Reporting Requirements

For any stockpile soil sampling conducted the following must be provided in the applicable report:

- A table containing the results from both the field screening and laboratory analyses;
- A site map depicting the location of all sampling points. This map shall also include the distance from a permanent fixed point to the referenced stockpile.
- Laboratory analysis sheets with all required information.

4. Soil Boring Method and Locations

Direct push technology is considered the standard drilling method for soil borings. If an alternate method is necessary or preferred, then a proposal including, but not limited to, methodology, justification, location, and three bids shall be submitted to the Division for approval.

All borings shall be no closer than 15 feet from each other, if there are contradictory requirements in guidance (i.e. borings will be closer than 15 feet), then a proposal/plan in the form of a map shall be submitted and approval obtained prior to field activities. Soil borings shall be advanced in undisturbed soil and no boring shall be placed within an occupied tankhold or line trench.

a. Tankhold Borings

Each soil boring shall be installed into undisturbed soil located no more than three (3) feet from the edge of the tankhold and be advanced to a depth of 15 feet below ground surface, at the zone of saturation, or at the soil/bedrock interface, whichever occurs first. If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample and the OVD reading for the bottommost sample indicates petroleum contaminant levels higher than identified in shallower intervals, then the boring depth shall be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

In the event of the tankhold floor is known to be greater than fifteen (15) feet, then each boring shall be advanced to a depth of 1 foot below the tankhold floor with all other caveats noted in the previous paragraph.

b. Dispenser Borings (also end of product line borings)

Each boring shall be installed adjacent to the dispenser/dispenser island into undisturbed soil no more than three (3) feet from the dispenser/dispenser island and end of product line. Each boring shall be advanced to a maximum depth of fifteen (15) feet below ground surface, at the zone of saturation, or at the soil/bedrock interface whichever occurs first. If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample and the OVD reading for the bottommost sample indicates petroleum contaminant levels higher than identified in shallower intervals, then the boring depth shall be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

c. Product Line Borings

Each boring shall be installed adjacent to the product line into undisturbed soil no more than three (3) feet from the product line trench. Each boring shall be advanced to a maximum depth of fifteen (15) feet below ground surface, at the zone of saturation, or at the soil/bedrock interface whichever occurs first. If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample and the OVD reading for the bottommost sample indicates petroleum contaminant levels higher than identified in shallower intervals, then the boring depth shall be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

d. Soil Source/Delineation Borings

Boring(s) shall be placed no less than fifteen (15) feet from each suspected contaminated boring based on OVD screening. Borings installed less than fifteen (15) feet apart may not be considered Fund reimbursable. These borings shall be placed in undisturbed soil in a grid around the contaminated soil boring and advanced to the same depth as the contaminated soil boring, the zone of saturation, or the soil/bedrock interface, whichever occurs first. Each soil boring shall be installed in undisturbed soil located no more than three (3) feet from the edge of the tankhold or underground structure or backfill material (pea gravel, sand etc.). If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample and the OVD reading for the bottommost sample indicates petroleum contaminant levels higher than identified in shallower intervals, then the boring depth shall be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

5. Soil Boring, Monitoring Well, Recovery Well, Soil Vapor Extraction Point, Vacuum Monitoring Point, or Injection Well - Soil Sample Collection

Soil samples for laboratory analysis shall be collected from any soil boring, well, or point being installed unless:

- The boring is solely for injection purposes or utilizing a screening technology, including soil gas surveys.
- A proposal to not collect soil samples is submitted to the Division and specific approval in writing is obtained.

The sample interval shall coincide with site-specific conditions as well as sampling equipment utilized. The following should be considered when determining the sample interval for soil sample collection:

- The length of the sampling device or apparatus. Samples shall be collected at a minimum of every 2 feet or half of the sampling device length, or a change of physical soil properties (i.e. petroleum staining, olfactory, etc.)
- High-density soil sampling, shorter intervals and increased collection for laboratory analysis are generally related to ASC confirmatory sampling, otherwise approval shall be obtained prior to implementation.

It is recommended that sample intervals be discussed with the Division project manager prior to and if necessary, during field activities, especially if boring depths are expected to exceed 30 feet.

6. Procedure for Screening and Selection of Soil Sample for Laboratory Analysis

a. Soil Sample Collection for Laboratory Analysis (excavation areas and stockpiles)

All samples shall be collected from various depths of the excavated material to ensure that undue volatilization of the petroleum constituents has not occurred. No samples shall be collected at a depth of less than 1 foot below the surface of the stockpile. Surficial samples are not acceptable. The sample for laboratory analysis shall be immediately placed into a laboratory prepared jar in a manner that eliminates headspace and decreases volatilization of any contamination. Soil shall be transferred to the laboratory prepared jar using a properly decontaminated stainless steel or new disposable scoop, knife, spatula or gloved hand (new gloves used for each sample.) The laboratory prepared jar shall be properly labeled, immediately stored, and maintained at the required temperature in accordance with the applicable laboratory method until the samples are delivered to the laboratory. Once the potential laboratory sample has been properly stored, a representative soil sample shall be placed in a sealing plastic bag for OVD screening.

b. OVD Screening

Once the soil sample for potential laboratory analysis has been placed in the appropriate container and properly stored on ice:

- A representative amount of soil shall be placed in a sealing plastic bag, leaving some air space.
- The amount of soil placed in the sealing plastic bag(s) shall be generally the same for each sample interval to ensure proper comparison to the greatest practical extent.
- The bag shall be properly labeled and the sample allowed to volatilize for a minimum of 15 minutes, but no longer than 30 minutes at a minimum of 68°F.
- All samples shall be allowed to volatilize for an equal period of time prior to screening.
- Once the sample has volatilized, the headspace shall be screened with an OVD in a manner to minimize loss of headspace.
- The use of vapor detection tubes or other methods of screening other than the OVD are not acceptable unless approved in advance by the Division.

c. Soil Sample Collection for Laboratory Analysis (boring, monitoring well, recovery well, soil vapor extraction point, etc.)

Continuous sample collection utilizing a sampling sleeve, split spoon, or continuous sampler is required for the entire depth of the boring, well, or point. Lithological logging shall be in accordance with [section VI.B.14](#). Boring Log and Well Installation Diagram and [Appendix 1.h](#) Standard Boring Log Template. OVD screening shall be completed for the entire depth of the boring, well, or point (including samples bagged below the water table surface). Collection of soil samples from drill cuttings is not acceptable. If hand augering is utilized for clearing purposes (i.e. ensuring no subsurface obstruction) proper decontamination of any tool is required. Samples from hand augers shall be collected in consistent intervals and in accordance with [section VI.B.5](#) Soil Sample Collection and [section VI.B.6](#) Procedures for Screening and Selection of Soil Sample for Laboratory Analysis.

Upon sample retrieval, the soil sample shall be split in half lengthwise. One side of the sample shall be immediately placed into a laboratory prepared jar in a manner that eliminates headspace and decreases volatilization of any contamination. Soil shall be transferred to the laboratory prepared jar using a properly decontaminated stainless steel or new disposable

scoop, knife, spatula or gloved hand (new gloves used for each sample.) The laboratory prepared jar shall be properly labeled, immediately stored, and maintained at the required temperature in accordance with the applicable laboratory method until the samples are delivered to the laboratory.

Once the potential laboratory sample has been properly stored, a representative soil sample shall be placed in a sealing plastic bag for OVD screening and the lithology description and documentation in accordance with [section VI.B.14](#). Boring Log and Well Installation Diagram and [Appendix 1.h](#) Standard Boring Log Template.

The following criteria shall be used when selecting soil samples for laboratory analysis:

	Scenario 1	Scenario 2	Scenario 3
OVD Reading	No	No	Yes
Visual or Olfactory Observations	No	Yes	Not Applicable
Total Samples to be Analyzed	1	2 ¹	3 ²
Deepest Soil Sample	X	X	X
Sample with Visual or Olfactory Observations		X	
Sample with Highest OVD Reading			X
Shallowest Sample that OVD Indicates Contamination			X

¹ If one (1) soil sample meets both of the above listed criteria, then only that sample shall be submitted for laboratory analysis.

² The sample with the highest OVD reading above the zone of saturation or refusal shall be submitted for laboratory analysis. If this sample coincides with the deepest sample, then the sample with the next highest OVD sample shall be submitted for laboratory analysis.

Samples within the saturated zone shall not be submitted for laboratory analysis

- 1) At a minimum the deepest sample collected immediately above the soil/bedrock interface, the zone of saturation,

or the bottom of the boring, whichever occurs first, shall be submitted for laboratory analysis.

If the OVD readings and other field screening techniques (visual or olfactory) indicate that soil contamination does not exist at a boring or well location, then the deepest sample will be the only soil sample submitted for laboratory analysis for that boring or well location.

- 2) If visible or olfactory observations indicate petroleum contamination, then one (1) sample for this category shall be submitted for laboratory analysis, per boring or well, in addition to the deepest sample collected that is not within the zone of saturation. If one (1) soil sample meets both of the above listed criteria, then only that sample shall be submitted for laboratory analysis.
- 3) If OVD readings indicated that contamination does exist, in addition to the deepest sample:
 - The sample with the highest OVD reading above the zone of saturation or refusal shall be submitted for laboratory analysis. If this sample coincides with the deepest sample, then the sample with the next highest OVD sample shall be submitted for laboratory analysis.
 - The shallowest sample with the highest OVD screening indicating petroleum contamination shall be submitted for laboratory analysis.

High-density soil sampling, shorter sample intervals and increased sample collection/submittal for laboratory analysis, is generally conducted during ASC. If required, approval must be obtained prior to conducting.

In the event surficial samples are necessary, a proposed sample plan shall be provided to the Division project manager and written approval obtained prior to sample collection.

7. Quality Assurance and Quality Control (QA/QC)

In accordance with Rule 0400-18-01-.06(1), the following procedures shall be complied with when collecting environmental samples:

- Before and between sampling points, all equipment that is not pre-cleaned and disposable shall be properly decontaminated.
- Sampling personnel shall wear new, disposable sampling gloves while collecting samples. Gloves shall be changed between each sampling point.
- Sampling containers shall be laboratory prepared amber jars, amber bottles, or amber vials (i.e. meet the analytical method requirements).
- All samples shall be collected in a manner that decreases volatilization of any contamination.
- All samples shall be immediately placed in the appropriate container with proper labeling and immediately stored and maintained at the required temperature in accordance with the applicable laboratory method until the samples are delivered to the laboratory.
- A trip blank shall be included in each cooler that contains samples to be analyzed for VOCs.
- One (1) duplicate sample shall be collected during each water sampling event (i.e. groundwater, water supply and/or surface water). A duplicate sample is not required for tankhold water samples.
- A chain-of-custody shall be completed and included in each cooler. The chain-of-custody shall, at a minimum, include the facility ID number and be signed with date and time by the individual collecting the sample, signed with date and time by all intermediary persons possessing the sample, and signed with date and time by the laboratory receiving the samples (i.e. proper custody and security shall be maintained during all phases of transport). In the event the samples are shipped then this shall be denoted on the chain-of-custody to indicate the custody while being shipped.

8. Health and Safety Plan (HASP)

A Health and Safety Plan (HASP) shall be developed in accordance with the Occupational Safety and Health Administration (OSHA) Standard Number 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER). The HASP shall be site specific and include hazard assessment(s), emergency procedures and protective measures. The HASP shall be readily available at all times during the completion of any field activity at the subject site and shall be updated as needed based on the field activities being performed. Any individual who is covered by the provisions of the HASP shall acknowledge his/her understanding of, and their agreement to adhere to all of the HASP requirements by signing a certification located in the document.

9. Soil Analytical Methods

The applicable COCs with respect to the type of product released, if known, is provided in the [Table 1-1 Chemicals of Concern](#). If the product released is unknown, then the type of product(s) historically stored in the UST system shall be utilized as deemed necessary for the release investigation. When analyzing soil samples for volatile organics the laboratory shall follow the procedures outlined in the Test Methods for Evaluating Solid Waste, SW-846. The purge and trap procedures for the soil samples in Method 5030B shall be followed. The actual constituent analysis using gas chromatography with a mass spectrometer shall follow Method 8260B. All results shall be reported in (ppm). Lab analyses that report below detection levels (i.e. "BDL" or "ND") with Method Detection Limits (MDLs) above the applicable screening or cleanup levels will not be eligible for Fund reimbursement.

10. Monitoring Well, Recovery Well, and Soil Vapor Extraction Well Installation

The appropriate drilling methods and properly sized equipment shall be utilized for installation of a monitoring well, recovery well, soil vapor extraction well. The regional lithology and depth to groundwater shall be taken into consideration when selecting the appropriate drilling method and drill rig type and size, including historic information from subject sites and nearby sites.

First encountered water shall be properly assessed to ensure all source(s) for risk assessment are taken into consideration. Perched water can be an exposure source. Therefore, if water is encountered and deemed perched water, then wells shall be installed. Contact the Division project manager prior to or as needed during drilling activities if site conditions warrant monitoring wells in both the perched zone(s) and a lower zone of saturation. All historical and current information shall be utilized to provide any necessary justification for the discussion.

If shallow water, generally 15 feet or less, is encountered, then a proposal with the variation to the filter pack, filter pack seal, and grout shall be provided prior to well installation activities.

Reimbursement rates for well installation using a direct push rig, hollow stem auger or air rotary rig have been established. For any other drilling method, justification shall be provided. If reimbursement will be sought, three (3) quotes shall be provided with justification for fund reimbursable projects. Written approval must be obtained prior

to work. Any permits required by local, state or federal regulatory agencies shall be obtained prior to work.

11. Single Cased Wells

For standard single cased wells, the following specifications shall be followed unless prior justification is provided and written approval obtained. For sites that first encountered water is 15 feet or less, propose the specifications to the Division project manager for approval prior to installation.

Care shall be taken to ensure contamination is not spread from one lithologic unit to another.

- If the zone of saturation is not encountered in overburden and bedrock wells are required, then installing screen, filter pack, and filter pack seal (bentonite) shall be within the bedrock only.
- If the zone of saturation is encountered in overburden, the boring shall not be advanced into bedrock and the well shall not be completed below the soil/bedrock interface unless approved by the Division.

a. Minimum Borehole Diameter

- The borehole diameter shall be a minimum of four (4) inches larger than the outside diameter (O.D.) of the well casing. For example, a 2.5 inch O.D. casing would require a 6.5 inch diameter borehole.
- In cases where a 5.5 inch O.D. or larger core barrel will be used to drill the bedrock portion of the hole written Division approval is required.

b. Casing and Screen Type

- For initial investigation monitoring wells and soil vapor extraction points, 2-inch inside diameter (I.D.) pre-cleaned, flush threaded, Schedule 40 PVC should be utilized.
- For recovery wells, or potential recovery wells, 4-inch inside diameter (I.D.) pre-cleaned, flush threaded, schedule 40 PVC shall be utilized unless justification is provided and approved prior to installation activities.
- The screen shall have 0.01 inch factory milled slots. The well screen shall be terminated with a threaded end cap and the casing shall be terminated with a locking, watertight cap with a padlock.

c. Screen Length and Placement

- The screen length and placement shall be installed where the zone of saturation is intersected at all times, unless justification is provided, and written Division approval obtained prior to installation.
- If the screen is placed where groundwater does not enter the well or groundwater is above the top of the screen, then the cost for the installation of the monitoring well may not be reimbursed. An exception would be following ASC where the data justifies a variation and written Division approval obtained prior to installation.
- Typical placement is where two-thirds of the screen is below the zone of saturation and one-third is above.
- A centralizer shall be used in all monitoring wells greater than 50 feet in depth only when not setting inside of hollow-stem augers. Install the centralizer within the screened section. If the installation of a centralizer will affect proper installation of the well, then justification shall be provided to the Division project manager for prior approval of omission of a centralizer.

If a confined aquifer is encountered, then the water bearing section of the aquifer shall be screened.

d. Placement and Type of Filter Pack

A minimum of six (6) inches of the filter pack material shall be placed under the bottom of the well screen to provide a firm footing. The filter pack shall extend two (2) feet above the top of the screened section. A weighted tape shall be used to help prevent bridging and ensure the proper placement of the filter pack. If the total depth of the borehole exceeds thirty (30) feet, then a tremie pipe shall be utilized to properly place the filter pack unless the well is being installed through a hollow stem auger. The filter pack shall consist of clean, washed, well-sorted silica sand. To minimize particulate infiltration in the well, the formation grain size encountered shall be considered when selecting the filter pack grain size.

e. Placement and Type of Filter Pack Seal

The filter pack seal shall be placed on top of the filter pack and have a minimum thickness of two (2) feet. The filter pack seal shall consist of a high solids, pure bentonite material. A

weighted tape shall be used to help prevent bridging and ensure the proper placement of the filter pack seal. If the total depth to the top of the filter pack exceeds thirty (30) feet, then a tremie pipe shall be utilized to place the filter pack seal unless the well is being installed through a hollow stem auger. If the bentonite seal is placed above the zone of saturation, then a minimum of two (2) gallons of potable water shall be used to hydrate the pellets. The hydration time for the bentonite pellets shall be a minimum of one (1) hour.

f. Placement and Type of Annular Grout

The annular grout shall extend from the top of the filter pack seal to within two (2) feet of the surface. The annular grout shall consist of a mixture of Portland cement and 4%-6% powdered bentonite. A grout density of 13.5 to 14.1 lbs/gal shall be used. If water is present in the boring or the depth to the filter pack seal is greater than thirty (30) feet, then a tremie pipe shall be used to place the annular grout unless the well is being installed through a hollow stem auger.

g. Surface Completion

The final two (2) feet of the annular space shall be filled with concrete terminating with a flush-mounted manhole with a watertight, bolt-down loadbearing cover unless an alternate construction is approved in writing by the Division. These manholes shall be concreted in place and **sloped** so that surface drainage will be diverted. If the concrete slope, thickness, or horizontal extent is inadequate or failure occurs, then the RP and/or CAC will be responsible for replacement and/or repairs.

Contact the Division project manager where site conditions require above ground protective covers

All monitoring wells shall be clearly marked as monitoring wells and numbered.

12. Double Cased Wells

In the event site conditions warrant double cased wells, a proposal shall be submitted providing justification, specifications, and if reimbursement will be sought three (3) bids/cost proposals. At a minimum the specifications shall include:

- For wells with the outer casing installed into bedrock then decontaminated black steel shall be utilized. For wells utilizing only hollow stem augers, schedule 80 PVC may be allowed in lieu of black steel. The following, at a minimum, should be included in any proposal.
 - The outer casing shall be set at least two (2) feet into competent bedrock, the confining layer, or five (5) feet below the last indication of soil contamination. The casing shall then be grouted into place using a bentonite/cement grout. The grout shall consist of a mixture of Portland cement and 4%-6% powdered bentonite. A grout density of 13.5 to 14.1 lbs/gal shall be used. A tremie pipe shall be used to place the grout unless the well is being installed through a hollow stem auger. In addition, a minimum of 2 feet of the grout mixture shall be placed inside the casing. The grout shall be allowed to set for a minimum of 24 hours before continuation of drilling activities.
 - The inner casing and screen shall at least meet the requirements for single cased well unless justification is provided otherwise.
 - If reimbursement will be sought for the work, then three (3) bids/cost proposals (i.e. all-inclusive per foot rate) shall be provided. Note that if the Division finds that the use is not justified, then costs associated with the proposal, justification, and/or bids/cost proposal will not be considered.

13. Prepacked Screened Wells

In the event wells are to be installed in karst terrain or other lithology that has proven difficult to properly install the filter pack the Division will consider proposals for pre-packed screens. If reimbursement will be sought, then three (3) bids/cost proposals (i.e. all inclusive per foot rate) shall be provided. Note that if the Division finds that the use is not justified, then costs associated with the proposal, justification, and/or bids/cost proposal will not be considered. Those included with a plan (i.e. corrective action plan) will not be subject to additional charges.

14. Boring Log and Well (Monitoring, Recovery Well, Soil Vapor Extraction Point, etc.) Installation Diagram

A boring log shall be completed for any subsurface advancement with the exception of Advanced Site Characterization Technologies that utilize direct sensing technologies. For wells of any type, the well

installation diagram shall be included on the boring log (i.e. not separate forms/pages).

Boring logs must contain the following for each boring log/well installation diagram:

- TN UST Facility ID #
- TN facility name (as documented with the Division by the most recent notification)
- Boring # or Well #
- Start date and time of the boring or well
- Completion date and time of the boring or well
- Logger's name and P.E./P.G. license number
- Driller's name, company name, and TN license number
- Drilling method(s) used to complete the boring or well
- Type of sampler utilized to retrieve samples (i.e. spilt spoon, 5 feet continuous sampler, direct-push liner, etc.)
- % recovery for each retrieved sample (i.e. on a 25% scale from 1 to 100%)
- OVD reading of each sample interval
- Sample interval submitted for laboratory analysis
- The primary soil and/or bedrock clearly identified, followed by all applicable descriptions.
- Lenses or thin lithological layers encountered
- Presence/absence of free product; and
- Hydrocarbon odor observed

The following shall be included for each soil boring not being converted to a monitoring well (i.e. not required for well log/installation diagram):

- Latitude/longitude or northings/eastings as collected by a phone app (i.e. general location is acceptable as a professional survey is not necessary unless specifically required or approved)
- First encountered water as determined during drilling activities
- Material used for proper abandonment of boring

The following shall be included for each well (boring log / well installation diagram)

- Elevation of the top of the monitoring well (i.e. the top of casing) referenced to MSL
- Latitude/longitude or northings/eastings as provided by a Tennessee licensed professional surveyor
- Detailed monitoring well schematic which shall include, but not be limited to: the type and diameter of the well, borehole diameter, depth of borehole, depth of well, type of casing and screen, slotted

screen size, grain size of sand pack, depth to top of screen, depth to top of sand pack, and depth to top of bentonite seal.

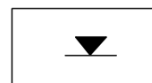
- Water level first encountered as observed during drilling activities and at completion of the well.

The description and identification of soils shall be conducted in accordance with the current ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures).

The following symbols shall be utilized to depict water:



WATER LEVEL
FIRST ENCOUNTERED



WATER LEVEL
ON COMPLETION

15. Proper Abandonment of Borings and Wells

If site-specific conditions or well specific construction warrants alternative methods of proper abandonment to ensure no adverse influence or potential impact, the necessary method, justification, and if reimbursement will be sought three (3) cost proposals shall be submitted for approval prior to activities. Otherwise, proper abandonment shall be conducted as follows. Any permits required by local, state or federal regulatory agencies shall be obtained prior to work.

Direct Push Borings:

All direct push soil borings shallower than 30 feet shall be properly abandoned utilizing bentonite to surface completion and properly hydrated. Soil cuttings shall never be used for abandonment.

Monitoring Well, Recovery Well, Soil Vapor Extraction Point, Vacuum Monitoring Well, etc. and borings greater than 30 feet:

Prior to abandonment all wells shall be gauged for free product and to verify total depth. If free product is observed, abandonment activities shall be immediately terminated, and the Division shall be immediately contacted.

All wells shall be properly abandoned by a Tennessee licensed well driller and in accordance with local, county, state, and federal requirements.

For wells with risers, the casing shall be cut off at or below ground level. Standard wells and soil vapor extraction points shall be filled from bottom to top with a grout mixture of Portland cement and 4%-6% powdered bentonite. A grout density of 13.5 to 14.1 lbs/gal shall be used.

If a soil boring has a total depth of greater than thirty (30) feet, then a tremie pipe shall be utilized to place the grout mixture of Portland cement and 4%-6% powdered bentonite. A grout density of 13.5 to 14.1 lbs/gal shall be used.

16. Decontamination Procedures

Drill rigs and other equipment shall be inspected for lubricant or fluid leaks that could be a potential contaminant to soil or groundwater. All "over-the-hole" portions of the drilling equipment shall be steam cleaned prior to use and as necessary between borings. All downhole equipment (i.e. augers, drill rods, tools, etc.) shall be steam cleaned prior to use and between all subsequent boring/well locations. Properly constructed decontamination areas with containment are required.

All sampling equipment that is not pre-cleaned and disposable (i.e. stainless-steel scoops, split spoons, etc.) and all monitoring equipment, shall be properly decontaminated before each use by the following procedure:

- Cleaned with a laboratory grade detergent wash;
- Triple rinsed with distilled water; and
- Allowed to air dry.

Any decontamination fluid shall be contained and be managed in a manner that will not cause harm to human health or the environment. Disposal shall be in accordance with all applicable Local, State, and Federal Laws. Collection of laboratory samples for characterization of containerized fluids shall be conducted prior to leaving the site following completion of the work (i.e. a separate visit will not be considered for reimbursement).

17. Well Development

Monitoring well development shall not begin until a minimum of 24 hours following completion of the well, which includes installation of the surface pad and well skirt/lid or well vault.

The main purpose of developing new monitoring wells is to remove the residual materials remaining in the wells after installation has been completed, and to try to re-establish the natural hydraulic flow conditions of the formations which may have been disturbed by well construction, around the immediate vicinity of each well.

A new monitoring well should be developed until the column of water in the well is free of visible sediment, and the pH, temperature, turbidity, and specific conductivity have stabilized. Stabilization is defined as three consecutive readings within 10% of each other. In most cases the above requirements can be satisfied; however, in some cases the pH, temperature, and specific conductivity may stabilize but the water remains turbid. If no drilling muds/fluids were utilized and over 5 wells volumes have been removed but the water remains turbid, provide the Division project manager with all relevant information and the proposed course of action.

For wells installed in fine-grained soil, development shall start slowly and only increased if turbidity remains low unless sediment has settled at the bottom of the well, within the well screen.

If the well is bailed or pumped to dryness or near dryness, the water table should be allowed to sufficiently recover (to the static water level) before the next development period is initiated. Continuous flushing over a period of several days may be necessary to complete the well development. In the event the well does not recover then the Division project manager shall be contacted.

All field observations, decisions, and equipment readings shall be documented in the field logbook and/or TDEC-UST form(s). Collection of laboratory samples for characterization of containerized fluids shall be conducted prior to leaving the site following completion of the work (i.e. a separate visit will not be considered for reimbursement).

18. Surveying

A licensed surveyor, under the Tennessee Land Surveyor Law (T.C.A. §62-18-101 et seq.), shall be utilized to conduct a survey to obtain the following information:

- The elevation of an established and documented point on the top of each well casing correlated to Mean Sea Level (MSL). The reference point is usually identified by the well installer using a permanent marker, for PVC wells, or by notching the top of casing with a chisel, for stainless steel wells. By convention, this marking is usually placed on the north side of the top of casing. If no mark is

apparent, the person performing the survey should survey each well from the north side of the top of casing. Note all future groundwater measurements shall be made at the same established and documented point on the top of the well.

- The distance and angle from monitoring well four (MW-4) to the established and documented point on the top of each well casing shall be measured. All angles shall be measured from magnetic north. This data shall be used to establish the monitoring well location map.
- Completed survey data including map shall be submitted to the Division project manager
- If additional wells have been installed, all new and existing well shall be surveyed.

19. Water Level Measurements

All water level measurements shall be referenced from the established and documented point on the top of each well casing (i.e. the same location that was surveyed). Measurements shall be to the nearest 0.01 foot. Static water levels shall be measured using an oil/water interface probe. Measurements shall be taken no sooner than 24 hours after completion of well development, but prior to purging. Static water level measurements shall be taken prior to each sampling event.

If free product is encountered during water level measurements, then the thickness of the free product shall be measured to the nearest 0.01 foot. For newly documented free product, then a bailer shall be lowered into the free product and photographic documentation provided with any related report, including a Hazard Notification Report.

During each gauging related to a sampling event, the depth to the bottom of the well shall also be measured. Instances where wells depths are greater than 30 feet, a weighted measuring device shall be used. If the total depth has increased/decreased, then the well should be regauged. In the event the total depth has decreased this shall be documented and recommendations, including the need for re-development shall be provided to the Division project manager.

20. Free Product Present During Groundwater Sampling

If free product is present, then a minimum of three well volumes shall be purged from the well prior to collecting a sample. If free product is present after purging, then contact the Division project manager. A

sample shall be collected with a new bailer as soon as a sufficient volume of groundwater recharges into the well.

Any groundwater sample collected prior to SSCLs approval shall be analyzed for COCs for “undetermined” water use.

21. Purging

Following static water level measurement, the total volume of water in each well shall be calculated. A minimum of three (3) well volumes shall then be purged from each well until the pH, temperature, turbidity, and specific conductivity have stabilized. Stabilization is defined as three consecutive readings within 10% of each other.

If the well is purged to dryness before three (3) well volumes are obtained, then no further purging shall be required. The samples shall then be collected as soon as a sufficient volume (75% of the original water column) of groundwater recharges into the well. In the event the well does not recharge to 75% of the original water column, then the Division project manager shall be contacted.

22. Water Sample Containers and Preservation

All sample containers shall be laboratory prepared amber vials (i.e. meet the analytical method requirements). pre-cleaned and sealed by the distributor or laboratory. Each sample bottle shall be properly preserved prior to sample collection in accordance with the below table.

Sample Containers and Preservatives		
Parameter	Container	Preservative
Volatile Organics	40 ml amber glass vials with Teflon lined septa	Four (4) drops of 1:1 Hydrochloric acid
PAHs ¹	Contact laboratory for required volumes and quantity of containers	None
Metals ¹	1 liter plastic bottle	5 ml 70% Nitric acid

¹Field filter samples collected for PAHs and/or metals using a 0.45 micron filter.

23. Water Collection Methods

Upon collection, all water samples shall be immediately labeled, placed in a cooler, chilled, and maintained at the required temperature in

accordance with the applicable laboratory method until delivered to the laboratory. No sampling equipment shall be placed directly on the ground or other possibly contaminated surface prior to insertion into a well. A clean plastic sheet or other appropriate material shall be placed by each well for all sampling equipment. One duplicate sample shall be collected during each groundwater, surface water, and/or water supply well sampling event. Water samples collected for PAH and/or metal analysis shall be field filtered using a 0.45 micron filter.

Groundwater from Wells (Monitoring, Recovery, SVE, etc.)

All samples from groundwater monitoring wells shall be collected with a new, disposable bailer. To keep agitation of the sample to a minimum, the bailer shall be slowly lowered into the water column. When transferring the sample from the bailer to the sample container, care shall be taken to minimize agitation. When collecting volatile organic samples, the sample container shall be completely filled so that air bubbles are not trapped inside. Care shall also be taken to have minimal overflow so that the preservative is not lost.

Surface Water Samples

A surface water sample may be collected directly into the sample container when the surface water source is accessible by wading or other means. The sampler should face upstream if there is a current and collect the sample without disturbing the bottom sediment. The surface water sample should always be collected prior to the collection of a sediment sample at the same location. The sampler should be careful not to displace the preservative from a pre-preserved sample container, such as a 40-ml VOC vial.

If a surface water sample cannot be collected by wading, then a bailer can be used. This technique may not be successful where strong currents are found. When transferring the sample from the bailer to the sample container, care shall be taken to minimize agitation. When collecting volatile organic samples, the sample container shall be completely filled so that air bubbles are not trapped inside. Care shall also be taken to have minimal overflow so that the preservative is not lost.

Generally, three (3) water samples shall be taken to adequately assess any surface water quality impact. The three (3) samples shall be:

- 1) Upstream,

- 2) At the point of known petroleum impact (i.e. seep from the bank of the surface water feature, etc.), or most likely impacted area if not known, and
- 3) Downstream.

Water Supply Well Samples

Water supply well samples shall be collected from the tap, if possible. Faucet aerators and screens should be removed before taking samples. Anything attached to the end of the faucet, e.g. hoses, should be removed before taking samples. The tap should be allowed to run for a minimum of 15 minutes, if allowed/possible, or until such time that the system is purged of standing water. When collecting samples, care should be taken to minimize agitation as well as overflow so that the preservative is not lost.

For water supply wells that are not currently utilized and do not have functioning water pumps or other mechanisms for fluid recovery, it is not intended that pumps or other equipment be removed from the well to collect a sample. Contact the Division project manager if this is applicable.

For water supply wells that are not currently utilized and have no water pumps or other mechanisms for fluid recovery installed, the total volume of water in the well shall be calculated. A minimum of three (3) well volumes shall be purged from the well and until the pH, temperature, turbidity, and specific conductivity have stabilized. Stabilization is defined as three consecutive readings within 10% of each other. The sample from a drinking water well shall be collected with a new disposable bailer. To keep agitation of the sample to a minimum, the bailer shall be slowly lowered into the water column. When transferring the sample from the bailer to the sample container, care shall be taken to minimize agitation. When collecting volatile organic samples, the sample container shall be completely filled so that air bubbles are not trapped inside. Care shall also be taken to have minimal overflow so that the preservative is not lost.

Water Use Determination Samples

Following several other sequential processes to determine if an aquifer or water source is used as a drinking water source, water samples may be collected for comparison to the primary and secondary drinking water standards. A groundwater sample from a monitoring well that has NOT been impacted by petroleum contamination shall be analyzed for iron and manganese only. If all

monitoring wells have been impacted by petroleum contamination, collect and analyze a groundwater sample from the monitoring well with the lowest petroleum contaminant concentration. If the analytical results indicate that the iron and manganese concentrations are below the established secondary standard for both parameters (0.3 mg/L for iron and 0.05 mg/L for manganese), then consult with the Division project manager for additionally required primary and secondary drinking water standards. All primary and secondary drinking water analysis may be determined to be necessary. Refer to the Rules of TDEC -Division of Water Resources (DWR) Chapter 0400-45-01 Public Water Systems for the primary and secondary drinking water standards. Also refer to US EPA National Primary Drinking Water Regulations and National Secondary Drinking Water Regulations.

24. Disposal of Purge and Development Water

All purge and development water shall be managed in a manner that will not cause harm to human health and/or the environment. All purge and development water shall be disposal of in accordance with all applicable Local, State, and Federal Laws.

25. Water Analytical Methods

When analyzing water samples for Volatile Organics, the laboratory shall follow the procedures outlined in the Test Methods for Evaluating Solid Waste, SW-846. At a minimum, the following constituents shall be analyzed: benzene, toluene, ethylbenzene, xylenes, MtBE, and naphthalene. The samples shall be analyzed as follows:

- The purge and trap procedures for the water samples in Method 5030B shall be performed; then
- The actual constituent analysis shall be performed using gas chromatography with a mass spectrometer following Method 8260B.

The practical quantitation limit for benzene is 0.001 ppm, naphthalene is 0.002 ppm, and all others are 0.005 ppm using this method for groundwater samples. All results shall be reported in ppm.

When extracting water samples for semi-volatile organics, the laboratory shall follow the procedures outlined in the Test Methods for Evaluating Solid Waste, SW-846, Method 3510C. The Division approves the use of either Method 8310 (preferred) or Method 8270C SIM (alternative) for PAH analysis. Refer to [Table 1-1 Chemicals of Concern](#) for assistance in determining the applicable COCs for laboratory

analysis. Lab analyses that report below detection levels (i.e. "BDL" or "ND") with MDLs above program MCLs or RBCLs may not be eligible for Fund reimbursement.

26. Vapor Monitoring

Vapor monitoring shall consist of collecting vapor readings with a properly calibrated OVD of all subsurface structures (i.e. basements, utility vaults, sewers, etc.) within 300 feet of known contamination. Vapor monitoring shall be conducted, at a minimum, during site check activities, release investigation activities, and corrective action activities or as directed by the Division.

All structures which have been previously impacted by petroleum vapors shall also be monitored.

27. Receptor Monitoring

Following the initial response and completion of a water use and receptor survey, receptor monitoring should be conducted once per year until the contamination project is closed and no further action is required.

Unless directed to do otherwise by the Division, a limited field survey of receptors shall be conducted to monitor receptor status and/or usage. The field survey shall be conducted within one-tenth (0.1) mile radius of known contamination for aboveground and underground structures and one-half (0.5) mile radius for drinking water supplies. A Water Use and Receptor Survey Sheet shall only be completed if a new receptor is identified. Receptor Monitoring shall include, but not be limited to:

a) Existing receptors

Determine if any significant changes have occurred to any existing receptors by conducting a receptor (field) survey. For example, if in the previous RAR the on-site structure was determined to be commercial use but now an individual(s) resides there, then commercial use would change to residential use.

b) Newly discovered receptor(s)

Determine if any new receptors exist that have not been previously identified.

For example, the installation of a new drinking water supply or the construction of a new residential or commercial structure.

- If a new drinking water supply is identified, then the location of the drinking water supply and distance from the most contaminated well shall be provided in the applicable report including a color topographic map with the site location indicated. The map shall depict the location of all drinking water supplies (wells and springs) within a one-half (0.5) mile radius of the UST site. The topographic map shall depict the one-tenth (0.1) and one-half (0.5) mile radii from the UST site.
- If a new residential or commercial structure is identified within a one-tenth (0.1) mile radius, then complete a water use survey form for the property. Prepare an updated scaled receptor map of the area depicting the current off-site receptors for each applicable pathway and provide a copy to the Division.

C. Initial Response

Immediate actions shall be taken to identify fire, explosion, and/or vapor hazards. To assist with the identification of all potential hazards, it is recommended that a map of utilities within 0.1 mile from the confirmed contamination be obtained from local authorities. At a minimum, a request shall be submitted to Tennessee 811 Call (TN One Call) for utility location. Initial vapor monitoring shall be conducted within 300 feet of known contamination. If readings indicate vapor impact(s), then the radius shall be extended, from 300 feet to 0.1 mile. All documentation shall be included in the applicable report. A Hazard Notification Report shall be submitted within 72 hours in accordance with Rule 0400-18-01-.06(4)(a) if a hazard and/or impact is identified.

If not already conducted, a public information request shall be submitted to the Division requesting historical remediation, notification, and/or compliance files for the facility. This is considered initial project setup and review with respect to reimbursement tasks.

Water Use Survey Instructions

A water use survey shall be conducted to determine sensitive receptors and whether they have been impacted.

The following shall be conducted prior to any field activities:

1. Public Water System Preliminary Information Instructions:

- a. Contact the Division of Water Resources to determine if the area within 0.5 mile from the confirmed petroleum UST contamination is Special Source Water, Site Specific Impaired Groundwater, or has been determined to meet the definition of Unusable Groundwater.
- b. Contact the Division of Water Resources to determine if the area within 0.5 mile from the confirmed petroleum UST contamination is within a drinking water source protection area, which includes both wellhead protection areas for water supply wells and source water protection areas for surface water intakes. DWR will advise if these are present and will provide the entity to contact for additional information.

If a drinking water source protection area is identified within 0.5-mile of known contamination, contact the Division. Additional steps may include the following:

- a. Contact the public water entity regarding any water supply wells or surface water intakes.
- b. This initial contact should be considered a form of outreach and public notification to the public water entity. Therefore, basic information about the confirmed petroleum UST release shall be provided including impacts identified thus far and their locations, monitoring well information including total depths and screened intervals, and other relevant information.
- c. Advise that any information provided will be placed in a report that will be available to the public upon request.
- d. Request the location of the drinking water source protection (wellhead or source water) area, location of well or surface water intakes, and well/lithology logs of any public water supply well.
- e. If any extraction/intake points are within 0.5 mile then ask if any of the petroleum UST chemicals of concern are analyzed routinely. The most recent analytical results shall be requested. If routine analysis of petroleum UST COCs is not conducted, schedule a conference call or virtual meeting with the Division project manager, the local utility entity, and a DWR representative regarding the need for future sampling/analysis and which entity will be responsible for conducting that. For reimbursement from the petroleum UST fund, the CAC shall conduct the sampling, analysis, and reporting to all entities.

- f. Obtain what type, if any, water treatment processes are utilized for the extraction/intake points within 0.5 mile.
- g. Ask if there are any local ordinances or restrictions regarding private drinking water well installation. If any, obtain the ordinance or restriction and provide in the applicable reports.

2. Private (Individual) Water System Preliminary Information Instructions:

- a. Obtain preliminary private water supply information within 0.5 mile of the site. Data is available through TDEC at the following link: [Link to TDEC Dataviewer](#)

3. Karst Survey Preliminary Information Instructions:

- a. Evaluate available information to determine if the site is potentially within a karstic region. For example, USGS publication 2014-1156 Karst in the United States: a digital map compilation and database is an acceptable resource as a preliminary determination if a Karst Survey is necessary.
- b. If a Karst Survey is necessary, then examine USGS topographic map(s) within a 0.5 mile radius of the site. This shall include the identification of all springs, sinkholes, sinking streams, and/or caves on the topographic maps(s).
- c. The results of the karst survey shall be documented in the applicable report.

4. Preliminary Map Instructions:

- a. Develop a map of all properties for which personal contact will be required for the field survey(s) to complete the water use survey.
- b. Information available at the following link is useful for identifying properties, obtaining preliminary information to be confirmed with field surveys, and developing a map with identifiers for each property: [Link to Tennessee Property Assessor](#)
- c. It is recommended to include a unique identifier for each property, such as the 911 address. The parcel ID can also be used when the 911 address cannot be confirmed.

Field Activities for Water Use, Karst, and Receptor Survey:

The water use survey, karst survey, and receptor survey field activities detailed below are intended to be completed concurrently. Any contact with private water supply users, property owners, or lessees within 0.1 mile should be considered a form of initial public outreach and public

notice. This also applies to information obtained regarding water use, karst lithology and receptors.

5. 0.5 Mile Water Use Survey Instructions:

- a. Contact all private drinking water supply users identified in the records search of one-half (0.5) mile. At least two in-person contact attempts shall be made at an appropriate time (i.e. business hours for businesses and after business hours for residences) unless the property is posted or gated. If a property is gated or a no trespassing sign is posted, then documentation of such shall be made, and two phone and/or mail attempts shall be made to contact the property owner.
- b. Observations shall be made while approaching and leaving with respect to any potential water source (well, surface water, water meter). Even if a water meter is present, documentation of any other water source is necessary, both visually and through personal contact.
- c. If actual contact is made in-person, then the entity shall be provided the CACs contact information in the event hazards are observed in the future.
- d. Contact information (i.e. phone number, electronic mail address, and/or postal mail with preferred method denoted) shall be obtained from each individual or entity contacted.
- e. If no contact is made and there is a water meter on the property, confirm with the local water supplier that the meter is in use. Provide a photo of the water meter for the property.

6. 0.25 Mile Water Use Survey Instructions:

- a. Perform a field survey within a one-quarter (0.25) mile radius of the UST site to determine the existence of any water use supplies. If a potable drinking water supply is determined to be in use, then at least two in-person contact attempts shall be made at an appropriate time (i.e. business hours for businesses and after business hours for residences) unless the property is posted or gated. If a property is gated or a no trespassing sign is posted, then documentation of such shall be made and two phone and/or mail attempts shall be made to contact the property owner.
- b. Observations shall be made while approaching and leaving with respect to any potential water source (well, surface water, water meter) as well as property use (residential,

commercial, etc.). Even if a water meter is present, documentation of any other water source is necessary, both visually and through personal contact. The current and most likely future use of the property shall be documented along with the type of foundation.

- c. Contact information (i.e. phone number, electronic mail address, and/or postal mail with preferred method denoted) shall be obtained from each individual or entity contacted.
- d. Document the date(s), time(s), and method of each contact attempt.
- e. If actual contact is made in-person, then the entity shall be provided the CACs contact information in the event hazards are observed in the future.
- f. Any private potable water supply (i.e. springs, water wells) and any other accessible private water supplies within 0.25 mile shall be sampled for the applicable COCs, depending on the type of petroleum released if known and if not known type of petroleum stored in the UST system.
- g. If no contact is made and there is a water meter on the property, confirm with the local water supplier that the meter is in use. Provide a photo of the water meter for the property.

7. 0.1 Mile Water Use Survey Instructions:

- a. Door-to-door personal contact shall be attempted for all properties within a one-tenth (0.1) mile radius of the site. At least two in-person contact attempts shall be made at an appropriate time (i.e. business hours for businesses and after business hours for residences).
- b. Observations shall be made while approaching and leaving with respect to any potential water source (well, surface water, water meter) as well as property use (residential, commercial, etc.). Even if a water meter is present, documentation of any other water source is necessary, both visually and through personal contact.
- c. The current and most likely future use of the property shall be documented along with the type of foundation.
- d. Contact information (e.g. phone number, electronic mail address, and/or postal mail with preferred method denoted) shall be obtained from each individual or entity contacted.
- e. Document the date(s), time(s), and method of each contact attempt.

- f. If actual contact is made in-person, then the entity shall be provided the CACs contact information in the event hazards are observed in the future.
- g. Any private potable water supply (e.g. springs, water wells) and any other accessible private water supplies within 0.1 mile shall be sampled for the applicable COCs, depending on the type of petroleum released if known and if not known type of petroleum stored in the UST system.
- h. If no contact is made and there is a water meter on the property, confirm with the local water supplier that the meter is in use. Provide a photo of the water meter for the property

8. Karst Survey Instructions: To be completed if the UST site is determined to be within a Karst area, and/or the UST system (or any portion thereof) is/was installed in bedrock, and/or monitoring well(s) extended into bedrock.

- a. For any UST site within a Karst area, any bedrock spring within one-half (0.5) mile of the UST site at an elevation below that of the release, shall be visually inspected for indication of a petroleum release. Any spring with iron staining, petroleum sheen, petroleum odor, or other indication of petroleum contamination shall be sampled for the appropriate COCs.
- b. A walking or windshield field survey, whichever is deemed appropriate, shall be conducted within a one-quarter (0.25) mile radius of the UST site to determine the existence of any additional water use supplies.
- c. All potable water supplies and any other accessible water wells identified, regardless of use, within a one-quarter (0.25) mile shall be sampled for the applicable COCs, depending on the type of petroleum released if known and if not known type of petroleum stored in the UST system.
- d. If a water supply, regardless of use, is present, then the user and/or owner shall be personally contacted to obtain all applicable information.

9. Receptor Survey Instructions: To evaluate any hazards, receptors, etc. not addressed in previous steps. These include but are not limited to:

- a. The location of all surface waters within 0.1 mile shall be documented and visually inspected for indication of a petroleum impact from the associated petroleum release. Wet weather conveyances should be evaluated for petroleum impact taking into consideration human and

wildlife that may encounter impact(s) that could adversely affect downstream waters. Wet weather conveyances should not be included as a surface water for risk analysis unless impact has been observed that is anticipated to affect downstream surface waters or human/wildlife that may be adversely impacted.

- b. Identification and/or evaluation of any other potential fire, explosion, and/or vapor hazards not already evaluated.

Additional Potential Groundwater Assessment:

If there are no source water protection areas, public water supplies, private water supplies, or surface water intakes identified/documentated within 0.5 mile of the facility, then the following steps are required to be completed as part of the Water Use Survey, unless otherwise directed by the Division.

The below list is to confirm if the groundwater assessed meets requirements for various uses and, if necessary, confirmation that sufficient yield of 0.5 gal/min is achievable. The following activities shall be conducted in sequence:

- a. Collect a groundwater sample from the least contaminated monitoring well for laboratory analysis of iron and manganese only. If these are above secondary drinking water standards then stop at this step.
- b. If iron and manganese are below secondary drinking water standards, then consult with the Division project manager for additionally required primary and secondary drinking water standards. All primary and secondary drinking water analysis may be determined to be necessary. If any analytical result is above primary or secondary drinking water standards then stop at this step.
- c. If analytical results are below the primary and secondary drinking water standards then confirm that a shallower water bearing unit was not present and drilled through. If no shallower water bearing unit was identified, including perched water, then a pump test is necessary to confirm adequate yield. A suitable pump test method shall be used to determine if the impacted aquifer or water source is capable of providing a yield of at least one-half (0.5) gallon per minute. The monitoring well considered to have the highest yield shall be the first well pump tested. If this first well does not yield at least one-half (0.5) gallon per minute, then all additional monitoring wells shall be tested until either all wells have been tested or one well yields at least one-half (0.5) gallon per minute.

Water Use Survey Findings During a Site Check or UST Closure

For any site check or UST system closure (or any portion thereof) that a water use survey is conducted (i.e. when groundwater samples exceeded the Drinking Water or Undetermined Groundwater ISL), if a public drinking water supply (well or surface water) extraction/intake point is within 0.5 mile and/or the UST site is located within a drinking water source protection area (i.e. this includes a wellhead protection area or surface water source protection areas) then release response and assessment (IRHMR/ISCR) will be required if no other contamination project is ongoing.

For any site check or UST system closure (or any portion thereof) that a water use survey is conducted, if a water supply can be feasibly utilized in the future regardless of current use, then release response and assessment (IRHMR/ISCR) will be required if no other contamination project is ongoing.

D. Hazard Management

Upon notification of any petroleum related hazard, emergency response activities may be deemed necessary based on specifications of the petroleum release. The following site-specific conditions shall be documented:

- The actual or imminent threat of the petroleum release impacting surface waters, drinking water supplies, and/or sensitive ecosystems.
- Actual or imminent exposure to hazardous vapors at levels posing a significant risk to human health, safety, and/or the environment.
- The actual levels of combustible gases in confined spaces such as buildings, utilities, etc.
- Petroleum in the soil, or the ponding of petroleum that may migrate.

If the petroleum release constitutes an imminent, substantial danger to public health, safety and/or environment, appropriate emergency response activities shall be initiated immediately. If a Responsible Party (RP) is immediately determined, the RP shall be directed to begin abatement efforts. If the RP cannot be determined or refuses to take immediate, effective action, the Division may require the regional State Contractor to immediately mobilize, investigate, identify, and collect samples as well as initiate containment efforts as appropriate/required.

If the release is determined to be a non-imminent danger to public health, safety, and/or environment, emergency response can be initiated a maximum

of 24 hours after the report or discovery of the petroleum release. If additional resources are deemed necessary beyond those provided by an RP, the Division may require the regional State Contractor to mobilize, investigate, identify, and collect samples as well as initiate containment efforts as appropriate/required.

1. Drinking Water

a. Petroleum Impacted Drinking Water Complaint Response

Upon notification of any suspected petroleum impacted drinking water supply, a sample shall be collected at each complaint location. The cost of twenty-four (24) hour turnaround for laboratory analysis of the drinking water sample is preapproved for each complaint location. If the contaminant concentrations exceed the Groundwater Ingestion Primary and Secondary Drinking Water Standard for any applicable COC then the user(s) shall be personally notified and bottled water be provided immediately (at a maximum of 24 hours) upon receipt of the sample results.

b. Petroleum Impacted Drinking Water Supply Response - Temporary

In accordance with Rule 0400-18-01-.06(4)(b)1., upon discovery and/or confirmation of petroleum impacted drinking water, an alternate drinking water supply or filtration system as defined below shall be supplied **immediately**. These initial response activities are approved for implementation prior to submittal of the HNR. The temporary response may include the following, with the limitations specified:

- Bottled water – this is the only option if the drinking water supply is impacted with free product. Also an option for COC exceedance.
- Filtration system – this option should not be utilized if a drinking water source is impacted with free product, COCs equivalent to free product, or COCs that exceed filtration capabilities.

Unless directed to do otherwise by the Division, an IRHMR shall be submitted after initiation of the initial response activities related to impacted drinking water supply. If an impacted drinking water supply is discovered after the submittal of the

IRHMR, then an IDW-HMR shall be submitted within thirty (30) days.

c. Petroleum Impacted Drinking Water Supply Response – Permanent

If the laboratory analytical results from a petroleum impacted drinking water supply remains above the MCL for any COC after the initial response activity, then the Division may require a permanent source of potable water (PSPW) in accordance with Rule 0400-18-01-.06(4)(b)1.(iii). If required, the PSPW proposal shall be submitted detailing the actions and costs necessary to implement one of the options selected as listed below. Any permanent response activity for an impacted drinking water supply without prior Division approval may not be Fund reimbursable. A cost proposal shall be attached to the PSPW proposal and submitted to the Division for approval prior to implementation of any permanent response activity.

- Connection to a public water supply - The proposal shall detail the activities required to connect a municipal water supply and install a supply line to the impacted water supply user(s) and include a cost proposal. A scaled site map of the affected property(ies) shall be included depicting the location of the supply line(s) from the public water main to each user. All supply lines shall be constructed with a material that is resistant and impermeable to the applicable COCs.
- Installation of a new drinking water well - The proposal shall include a justification as to why the proposed well location and depth will not be impacted by the petroleum release. Design specifications shall meet all Divisions of Water Resources requirements for drinking water well construction and include a cost proposal. A scaled site map of the affected property shall be included depicting the location of the supply lines from the well to the residence. All supply lines shall be constructed with a material that is resistant and impermeable to the applicable COCs. A licensed well driller and licensed pump installer shall be utilized.
- Permanent Filtration System - The proposal shall describe the type of filtration system including, but not limited to, design specifications, manufacturers' specification sheets etc., and a cost proposal. Annual costs to maintain the filtration system (including filter replacement) shall be

included in the cost proposal. A permanent filtration system shall NOT be installed if free product has been observed in the water supply or laboratory analytical results at concentrations indicative of free product in the water supply. The user(s) must agree in writing to assume responsibility for the filtration system at a designated time in the future.

d. Monitoring

Based on site conditions, the Division will establish the reporting format and frequency of any additional monitoring.

e. Reporting Schedule

Upon discovery of a petroleum impacted drinking water supply, the following reports shall be submitted:

- in accordance with Rule 0400-18-01-.06(4)(a), a HNR form shall be submitted to the Division within seventy-two (72) hours of discovery of impacted drinking water
- In accordance with Rule 0400-18-01-.06(4)(c), an IRHMR is due within sixty (60) calendar days after the responsible party has been directed by the Division to begin an investigation. The IRHMR is a one time submittal per release. The report shall be prepared in accordance with the applicable portions of these guidelines as well as reporting templates.
- If the impacted drinking water supply is initially discovered after the submittal of the IRHMR, then an IDW-HMR shall be submitted within thirty (30) days after the discovery of an impacted drinking water supply. This report shall be completed in accordance with the attached IDW-HMR guidance.
- In accordance with Rule 0400-18-01-.06(4)(b)1.(ii), the Division may require a PSPW proposal and establish a submittal deadline.

2. Vapor Hazards

a. Petroleum Vapor Complaint Response

Upon notification of any petroleum vapor complaint, readings shall be collected utilizing an OVD and CGI. If any concentration is detected (OVD > 10 ppm, any detectable CGI reading) or by

olfactory, then the responsible party and/or CAC shall personally notify the Division, all occupants and/or property owners of impacted buildings, and/or the local fire department, and/or utility districts concerning the vapor impact.

b. Petroleum Vapor Hazard Response – Temporary

In accordance with Rule 0400-18-01-.06(4)(b)2., upon discovery and/or confirmation of any vapor hazard, immediate action shall be taken to eliminate the vapor hazard unless directed to do otherwise by the Division. These initial response activities are approved for implementation prior to submittal of the HNR.

The following initial response shall be conducted

- >10% LEL reading using a CGI in a building or confined space
 - Immediately call the local Emergency Management Responder/Fire Department.
- >100 ppm using an OVD or any detectable reading using a CGI
 - Educt vapors from the building or confined space environment utilizing explosion proof fan/blower(s); cross ventilation; flush or cover building drain(s); flush sanitary sewer(s) directed by or with permission from the local authority, etc.

Unless directed to do otherwise by the Division, an IRHMR shall be submitted after initiation of the initial response activities related to petroleum vapor impacts. If a petroleum vapor impact is discovered after the submittal of the IRHMR, then a PVI-HMR shall be submitted within thirty (30) days.

c. Petroleum Vapor Hazard Response – Permanent

If a petroleum vapor hazard remains after the initial response activity, then the Division may require a Petroleum Vapor Permanent Abatement (PVPA) proposal in accordance with Rule 0400-18-01-.06(4)(b)2. A proposal shall be submitted in accordance with the list below. Any permanent response activity for petroleum vapor abatement without prior Division approval may not be Fund reimbursable. A cost proposal shall be attached to the PVPA proposal and submitted to the Division

for approval prior to implementation of any permanent response activity.

Building (includes basement)

- The proposal shall detail the activities required to install a vapor extraction system (internal or external) and/or eliminate negative pressure from HVAC systems. The proposal shall include, but not be limited to, a cost proposal and diagram depicting the proposed vapor abatement system installation.

Confined space (sewers, vaults, etc.)

- The proposal shall detail the activities required to internally line or replace a sewer line, replace a vault with a water tight receptacle, install a permanent explosion proof blower system, etc. The proposal shall include, but not be limited to, a cost proposal and diagram depicting the proposed vapor abatement system installation.

d. Monitoring

Based on site conditions, the Division will establish the reporting format and frequency of any additional monitoring.

e. Reporting Schedule

Upon discovery of a petroleum vapor impact or hazard, the following reports shall be submitted as listed below.

- In accordance with Rule 0400-18-01-.06(4)(a), a HNR form shall be submitted to the Division within seventy-two (72) hours of discovery of a petroleum vapor impact or hazard
- In accordance with Rule 0400-18-01-.06(4)(c), an IRHMR is due within sixty (60) calendar days after the responsible party has been directed by the Division to begin an investigation. The IRHMR is a one time submittal per release. The report shall be prepared in accordance with applicable portions of these guidelines as well as reporting templates.
- If the petroleum vapor impact or hazard is initially discovered after the submittal of the IRHMR, then a PVI-HMR shall be submitted within thirty (30) days after the discovery of the petroleum vapor impact.
- In accordance with Rule 0400-18-01-.06(4)(b)2., the Division may require a PVPA proposal and establish a submittal deadline.

3. Free Product

a. Free Product Response

Discovery of free product not previously observed in observation, monitoring, or recovery well(s), on surface water, on ground surface, in excavation(s), in a basement, confined space or utility, or an increase of free product greater than one (1) foot above previous measurements in any type of well shall be considered an initial discovery. In accordance with Rule 0400-18-01-.06(4)(a), the discovery of free product shall be reported to the Division within seventy-two (72) hours using the Hazard Notification Report (HNR) Form.

Examples which require attempted removal of free product during initial response activities are:

- A measured free product thickness greater than 0.01 feet of free product in any well; or
- The presence of free product on a surface body of water; or
- The presence of free product on the ground; or
- The presence of free product within a subsurface structure; or
- The presence of free product within a tankhold or excavation.

Upon discovery of free product, initial response activities shall be initiated as dictated by site conditions and as listed below.

Unless directed to do otherwise by the Division, an IRHMR shall be submitted after initiation of initial response activities related to free product. If free product is discovered after the submittal of the IRHMR, then a FP-HMR shall be submitted within thirty (30) days.

Unless directed otherwise by the Division, the following activities are approved for implementation after the HNR has been submitted to the Division. **Under emergency conditions, these activities are approved for implementation prior to submittal of the HNR. Emergency conditions apply to impacted drinking water supplies, surface water, ground surface, basement or confined space, or utilities/utility excavation.**

Initial response activity/activities (i.e. may be a combination of activities) based on location of free product:

Drinking Water Supply:

- Temporary purification system
- Supply potable water (may include municipal water if available)

Surface Water:

- Booms
- Pads
- Vacuum truck
- Skimmer
- Underflow dam
- Interceptor trench

Ground Surface:

- Dry absorbent material
- Booms
- Pads

Basement or confined space

- Ventilation
- Booms
- Pads
- Vacuum Truck
- Interceptor Trench

Utilities/Utility Excavation:

- Excavation

Excavation (UST system or any component thereof):

- Booms
- Pads
- Vacuum truck
- Trash pump, only if can predominately remove free product and not water

Monitoring, Recovery, or Observation Well:

- MEME

UST System (secondary containment, remote fills, etc.):

- Pads
- Vacuum truck
- Dry absorbent material

Other – contact Division with a preliminary proposal, prior approval required

b. Free Product Investigation and Free Product Removal Plan

If free product remains after the initial response activity, then the Division may require free product investigation and a detailed plan shall be submitted in accordance with the Free Product Investigation Plan (FPIP) report template in [Appendix 1](#). Free product investigation activities may include, but not be limited to:

- Advanced Site Characterization
- High density soil sampling
- Additional monitoring and/or potential recovery wells.

These activities shall be completed in accordance with all applicable portions of these guidelines as well as reporting templates. Any investigation of free product without prior Division approval may not be Fund reimbursable. The findings from the free product investigation shall be documented in the Free Product Investigation Report (FPIR) or as required by the Division. If a Free Product Removal Plan (FPRP) is required, then it shall include any long-term response activity as listed in the below based on the site-specific impact(s).

Free product removal plan activity/activities (e.g. may be a combination of activities) based on location(s) of free product.

Drinking Water Supply

- Provide municipal water
- Install a new well
- Provide a permanent approved purification system

Monitoring or Recovery Wells (includes SVEs)

- High vacuum dual phase treatment system

Observation Wells

- Additional UST system test(s)
- Absorbent sock

Surface Water

- Site-specific mitigation

Ground Surface Excavation

- Excavation

Utilities

- Excavation/replacement of utility

Basement and/or confined space

- Ventilation
- Site-specific mitigation

UST System (secondary containment, remote fills, etc.)

- Equipment repair or replacement (costs will not be Fund reimbursable)

Excavation

- Overexcavation

Other - Contact Division with a preliminary proposal

c. Reporting Schedule

- If a MEME has been conducted as a free product response activity, then a MEME report shall be completed in accordance with the applicable portions of these guidelines as well as reporting templates.
- A HNR form shall be submitted to the Division within seventy-two (72) hours of discovery of free product.
- IRHMR shall be submitted in accordance with the applicable portions of these guidelines, reporting templates, and deadline established by the Division.
- If free product is initially discovered after the submittal of the IRHMR, then a Free Product - Hazard Management Report (FP-HMR) shall be submitted within thirty (30) days after the discovery of free product. This report shall be completed in accordance with the attached FP-HMR report template. Recurrent or intermittent free product will not result in the submittal of additional FP-HMRs unless directed by the Division.
- If the Division requires an investigation in response to the discovery of free product, then a FPIP shall be prepared and submitted as a part of that investigation.
- The Division may require and establish a submittal deadline for a FPIR. The FPIR shall be prepared and submitted in accordance with report templates and a deadline established by the Division.
- The Division may require and establish a submittal deadline for a FPRP. If overexcavation and/or a high vacuum dual

phase treatment system is proposed as the long-term response, then a FPRP shall be submitted in accordance with the applicable portions of these guidelines as well as the Corrective Action Plan (CAP) report template. If another long-term response is proposed, then a plan shall include, but not be limited to, the following:

- Both the long and short term objectives of free product recovery at this site;
- The design of a free product recovery system or systems;
- An operation and maintenance (O&M) schedule;
- Schedules for monitoring and reporting;
- A list of actionable causes which would result in the re-evaluation of the continued need for and/or redesign and/or termination of the free product recovery system;
- A schedule and conditions for post termination monitoring; and
- A cost proposal.

E. Initial Response and Hazard Management Report

The IRHMR is due within sixty (60) calendar days after the Responsible Party has been directed by the Division to begin an investigation. Timely initial response and assessment are necessary to prevent further petroleum release and migration to the environment.

If hazards and/or impacts are identified, in accordance with Rule 0400-18-01-.06(4)(a) the Division shall be notified within 72 hours using a HNR form. The assessment activities and interim remedial efforts may and/or will be required to be expedited as deemed necessary. Site specific updates shall be provided to the Division project manager.

An IRHMR and associated activities shall be conducted as required by the Division. As specified in [section VI.C](#) Initial Response and [section VI.D](#) Hazard Management, actions shall be taken to identify fire, explosion, and/or vapor hazards as well as a water use survey. A receptor survey shall also be conducted to identify all potential hazards, sensitive receptors, and any impacts. All recent hazard management activities and findings shall be provided in the IRHMR as required in the report template.

The following receptors are required to be considered for inclusion in the IRHMR with respect to distance from petroleum contamination as well as subsequent RAR for:

- 0.5 mile: Drinking water supply (both water supply wells and surface water intakes), and other wells utilized or could be utilized in the future for other purposes.
- 0.1 mile: Residential structures and surface water (not utilized as a drinking water source)

If a well, regardless of use other than a monitoring well, is documented within 0.5 mile of the contamination, then inclusion as a receptor is required. This includes any well that is not properly closed and can feasibly be utilized in the future.

Any other sensitive or ecological receptors shall also be identified and detailed information provided in the report.

In the event a soil source investigation is deemed necessary it shall be conducted in accordance with [section VI.B.4.d](#) Soil Source/Delineation Borings, [VI.B.6.b](#) OVD Screening and [VI.B.6.c](#) Soil Sample Collection for Laboratory Analysis. Communication regarding location of soil borings, number of soil borings, and the sampling interval shall be conducted prior to and throughout field activities as needed.

Information that is required in the IRHMR includes:

- Facility/General Information
- Release Information, including actions taken to stop future release
- Receptor Information, including all sampling and/or monitoring
- Hazard Information, including all sampling and/or monitoring
- Hazard Management
- Assessment Activities conducted to date

All additional requirements are included in the report template and tables. The IRHMR shall be completed using the templates.

F. Initial Site Characterization and Exposure Assessment

The ISCR is due within 120 calendar days after the Responsible Party has been directed by the Division to begin an investigation. The ISCR is required to be completed in accordance with Rule 0400-18-01-.06(5)(b). Timely initial response and assessment are necessary to prevent further petroleum release and migration to the environment.

If hazards and/or impacts are identified, the Division shall be notified in accordance with Rule 0400-18-01-.06(4)(a) within 72 hours using a HNR form. The assessment activities and interim remedial efforts may and/or will be

required to be expedited as deemed necessary. Site specific updates shall be provided to the Division project manager.

The ISCR and associated activities should:

- Assess the petroleum release and summarize characteristics of the petroleum site, including but not limited to:
 - Site location,
 - Soil investigation and results summary, and
 - Water investigation and results summary.
- Propose additional assessment activities if COCs are above the proposed SSCLs, free product persists, or another hazard has been documented that requires additional assessment.
- Document all previous releases, reported and not reported, with a succinct summary of each.
- Provide a complete exposure assessment including but not limited to identification of risk to human health, safety and the environment associated with the petroleum release.
 - This includes completion of the Risk Analysis Report(s), request for site-specific standards for each COC, and justification of not considering a potential receptor in the RAR.
- Provide a preliminary conceptual site model.

Additional requirements are included in the report and table templates. The ISCR template and related table templates shall be utilized to ensure complete and consistent reporting and documentation.

First encountered water shall be properly assessed to ensure all source(s) for risk assessment are taken into consideration. Perched water can be a source and therefore if water is encountered and deemed perched water, then wells shall be installed. Contact the Division project manager prior to or as needed during drilling activities if site conditions warrant monitoring wells in both the perched zone(s) and a lower zone of saturation. All historical and current information shall be utilized to provide any necessary justification for the discussion.

If a private water supply is identified but not currently utilized for potable water or is used for any other use, then at least two Risk Analysis Reports are recommended to be completed, one without inclusion of the water supply not currently used as a drinking water source and a second including the private water supply. This is required to evaluate potential transport to a receptor that may include other hazards. Detailed information regarding the use shall be provided in the ISCR and if deemed necessary any justification for omitting the potential receptor.

1. Instruction for the Risk Analysis Report (spreadsheet completion)

Two “Add-Ins” must be activated in the spreadsheet, Analysis ToolPak and Analysis ToolPak - VBA options. To activate these options, select the “Tools” option from the menu bar and click on “Add-ins”. Check both Analysis ToolPak buttons. For recent versions of Excel, the security level for the spreadsheet must be set at “Medium”. To activate this option, select the “Tools” option from the menu bar and click on “Options”. Next, click on the “Security” tab and click the “Macro Security” button. Select the “Medium” category button and click “Ok”. Then click “Ok” on the “Security” page.

The Risk Analysis Report spreadsheet contains five separate spreadsheets:

Main

- Briefly describes the purpose of the Risk Analysis Report spreadsheet.

RBCL Report

- Compares the current COC concentrations to the Division established RBCLs.

On-Site SSCL Report

- Calculates the on-site SSCLs for all COCs that failed the RBCL comparison.

Off-Site SSCL Report

- Calculates off-site SSCLs for off-site receptor(s)

Summary

- The final SSCL for each COC for soil and groundwater

The RBCL Report contains a reset button (“Reset Entire Workbook”) at the top of report. The Reset button should be used to clear any entries made in the RBCL Report, On-site SSCL Report, and Off-site SSCL report. If data has been previously entered on any of the referenced reports, then the “Reset Entire Workbook” button must be clicked prior to performing a new data analysis. (Note that area labeled “Sample Data Temporary Storage Area” will not be deleted when the “Reset Entire Workbook” button is clicked).

2. RBCL Report

The general site information and current COC concentrations that are inputted into the RBCL Report will be used in the comparison to Division established RBCLs and are based in part on ASTM Designation:E1739-95 (reapproved 2015; withdrawn 2024). The results of the comparison represent the first step toward determining the site-specific cleanup levels for the site.

General Facility Information

The facility name and facility Identification Number (ID) as denoted in the most recent notification form shall be entered.

Groundwater Usage

Based on the results of the water use survey conducted in accordance with [section VI.C](#), Initial Response, if any water supply well is identified within 0.5 mile, then “drinking water” use shall be selected. Select the applicable button for the current groundwater usage at the site. The selection of the groundwater usage will aid in the generation of COC input tables. All drinking water sites (except gasoline) will evaluate the sixteen identified PAHs on the Tennessee PAH List (see Reference 2 “Tennessee PAH List”)

Type of Petroleum Released

The type of known petroleum product(s) released for the release shall be selected. If the cause and product released is not known, then the type of petroleum product(s) stored shall be selected. For example, if a potential or combination of gasoline, diesel, kerosene, or jet fuel has been released, then check the “Gasoline/Diesel/Kerosene/Jet Fuel” box only. If the product(s) released at the site are unknown, or are a combination of any known and unknown substances, then click the “Unknown” box only.

Pathway and Receptor Evaluation

Determining Pathways:

The on-site volatilization to indoor air pathway shall be clicked for all evaluations since a building could be constructed within the area of known petroleum contamination. (i.e., if a property is currently vacant, then it is reasonable to expect that a building will be constructed in the future). The off-site

volatilization to indoor air box shall be clicked if residential off-site structures are within one-tenth mile radius of known petroleum contaminated soil and/or groundwater (It is not necessary to run the off-site volatilization to indoor air scenario if all structures within one-tenth mile are commercial).

The on-site ingestion of groundwater box shall be clicked only if the drinking water supply is within the area of known petroleum contaminated soil and/or groundwater. The off-site groundwater ingestion box shall be clicked if a drinking water supply within one-half mile radius of the site is currently in use at the time of the RAR preparation, unless justification has been provided to the Division and/or a determination has been made that no drinking water supplies are in use within a one half mile radius of the site.

Determining Receptors:

Consider both the current use and reasonably expected future use of the property when determining on-site and off-site receptors. Current use should represent site conditions at the time the RAR is prepared. Off-site receptors shall be determined in the downgradient direction based on the predominant groundwater flow direction. (Note: If the groundwater flow direction varies, then determine all receptors in each direction of groundwater flow and click on all applicable boxes).

The on-site commercial/industrial worker box shall be clicked for all evaluations since it is reasonable to expect that a commercial building either is or could be built on-site. If the property is currently zoned commercial and no one resides at the property, then it is not reasonable to expect that the property will be re-zoned residential in the future, therefore only the commercial/industrial worker box would apply.

If a residential receptor is present, either on-site or off-site, then the resident child box must always be clicked.

If the area is metropolitan and revitalization projects are currently underway, then it is reasonable to expect that the property may be re-zoned residential. In this case, click both the resident adult and child boxes in addition to the commercial/industrial worker box. (Note: Details of any

proposed zoning changes and the revitalization project should be discussed in the applicable portion(s) of the ISCR).

Surface Water

The surface water (Domestic Water Supply Use) box shall be selected if a surface water body near the site is used for a drinking water supply and the distance to the surface water intake is within one-half mile of the site. If the surface water intake is upstream of the site, then surface water should not be considered to be a drinking water supply for the purpose of this evaluation.

The surface water (Organisms Only Use) box shall be clicked if a surface water resource is within a one-tenth mile radius of the site.

Creating COC Tables

After selecting the applicable pathways and receptors, click on the "Create COC and RBCL Table" box to create two tables for COC concentration entry: one for soil concentrations and one for groundwater concentrations.

Soil Analytical and Depth to Contamination

In number 5, enter the soil sample concentrations and depths for up to six (6) samples into the Soil Data Table. The data shall be for samples from each area of concern. The entry shall include only samples that exceed the applicable RBCLs and limited between depths of 3 feet and 30 feet. The data for the shallowest sample depth with concentrations above the applicable RBCLs shall be entered. The final soil site-specific cleanup level will be calculated from this entry. If all soil data are below RBCLs then enter the shallowest soil sample data. The samples shall be selected based on benzene concentration. If benzene concentrations are not present, then enter data from the samples with the highest MtBE concentration (and so forth in this order – toluene, total xylenes, ethyl benzene, naphthalene).

The depth of the sample shall be entered as the shallowest depth of the sample interval. For example, if a soil sample was collected between four (4) and six (6) feet, enter a depth of 4 feet into the spreadsheet.

All sample concentrations shall be entered as reported on the laboratory data sheets. If the sample result for any COC is reported to be below the laboratory detection limit (i.e., "ND", "BDL", "<number", etc.), then enter a less than (<) symbol followed by the actual reported detection limit that appears on the laboratory analytical sheet. For example, if the sample results are below the reported laboratory analytical detection limit and the referenced limit is "<0.005 mg/kg", then enter "<0.005" in the spreadsheet.

In Part B of this section, enter the original report name in which the sampling data can be verified. Include the date of the report and the page number or table name where the information appears.

Groundwater Analytical Contamination

In number 6, enter the sample date, sample location (i.e. monitoring well number), and COC concentration (in ppm) for the most recent groundwater sampling event. A maximum of six (6) groundwater samples can be entered. The sample results shall be obtained from the monitoring wells containing the highest benzene concentrations. If benzene is not present, then the samples shall be selected based on the following order of maximum concentration: MtBE, toluene, total xylenes, ethyl benzene, naphthalene, PAHs. If the sample result for any COC is reported to be below the laboratory detection limit (i.e., "ND", "BDL", "<number", etc.), then enter a less than (<) symbol followed by the actual reported detection limit that appears on the laboratory analytical sheet. For example, if the sample results are below the reported laboratory analytical detection limit and referenced limit is "<0.005 mg/l", then enter "<0.005" in the spreadsheet.

If two (2) different aquifers have been impacted, then provide a separate RAR for each aquifer. Only a single SSCL will be approved and will be the more conservative of those calculated.

In Part B of this section, enter the original report name in which the sampling data can be verified. Include the date of the report and the page number or table name where the information appears.

Applicable RBCLs and COCs

Click the “Compare RBCLs to COC Concentrations” button to generate two tables that compare the maximum soil/groundwater contaminant concentration to the applicable RBCL. The “Below RBCLs Y/N” column of each table displays the results of the comparison between the applicable RBCL and Maximum Soil/Groundwater concentration data. “Yes” indicates that the COC concentration is lower than the applicable RBCL. “No” indicates that the COC concentration is at or above the applicable RBCL.

Comparison of COC Concentrations to RBCLs

If all rows in both the soil and groundwater tables provide an evaluation answer of “Yes” and the offsite receptors are the same as the on-site receptors or no off-site receptors exist, then the site is eligible for a risk-based closure. The RBCL Report will display “Yes, this site is eligible for a risk-based closure at this time! Please check the summary page for site specific standards”. The completed RBCL Report shall be included in the appropriate attachment in the ISCR, along with the SSSR cover page and signature page, and submitted to the Division for review.

If a residential receptor exists or a commercial/industrial worker is using an off-site drinking water supply, then it is necessary to complete the On-Site SSCL Report and Off-Site SSCL Report to determine the final SSCLs.

If all rows in the soil and groundwater tables provide an evaluation answer of “Yes” and off-site receptors exist, then the RBCL Report will display “This site has passed the initial RBCL comparison, you must now select the soil type(s) and enter depth to groundwater on the On-site SSCL Report page (do not select the Calculate On-Site SSCLs Button), then perform the Off-site SSCL calculation(s)”. If any row for any COC from either table indicates “No”, then the site is not eligible for a risk-based closure based on the RBCL comparison. The RBCL Report will display “This site is not eligible for a risk-based closure as determined by the RBCL comparison. It is necessary to calculate the On-site SSCLs”. It will be necessary to calculate the on-site and off-site SSCLs by completing the On-Site SSCL Report and Off-Site SSCL Report.

In the case of some Polycyclic Aromatic Hydrocarbons (PAHs), the applicable RBCL may be less than the current chemical technological capabilities for laboratory analytical equipment (when employing the correct method). In these instances, the spreadsheet may display a “No”. If a value of “<Detection Limit Concentration” was entered in the spreadsheet for any PAH and “No” is displayed, then the COC did not fail and the requested SSSR level for the PAH shall be the SSCL displayed on the summary page.

3. On-site SSCL Report

The site-specific data inputted into the On-Site SSCL Report will be used to determine the on-site SSCLs for all COCs that failed the RBCL comparison in the RBCL Report. The calculations to determine the SSCLs are based in part on the intake equations in ASTM Designation: E1739-95 (reapproved 2015; withdrawn 2024). Once the SSCLs have been determined, the values will be compared to the current COC concentrations.

Soil Type

In number 1, for the “On-site” box, click the appropriate boxes for all subsurface material encountered during site investigation. If no overburden exists (i.e. no soil samples were collected), then click the bedrock box. In number 1, for the “Vadose Zone” and “Capillary Fringe” boxes, click on the boxes that best describes the predominant subsurface material type within each interval as determined during subsurface investigation. The predominant subsurface material type is defined as the material type that has the greatest percentage in the specified interval and is not based on any modifiers that may have been used to describe the material. For example, if the vadose zone material consists of 40% sandy silt and 60% silty clay, then the predominant vadose zone material type is clay.

The vadose zone material type will be used to determine the default values for bulk density, fractional organic carbon, and the volumetric air and water content in the vadose zone. The vadose zone material will also be used to determine hydraulic conductivity and effective porosity values that will be used in the Off-site SSCL Report.

The capillary fringe material type will be used to determine the default capillary fringe thickness (h_{cap}) in the SSCL calculations.

If the capillary fringe is located at the boundary between two major material types, then click on the material type that will result in more conservative risk calculations (conservative selection order is bedrock, sand, clay, then silt). For example, if the capillary fringe is at the soil/bedrock interface, then click the “bedrock” box. For the purpose of these calculations, the selection of bedrock material type includes gravel and fractured chert.

For the “Source for Soil Types” box, enter the date and boring log number where the vadose zone and capillary fringe soil type data can be verified.

Site Specific Parameters (Input parameters)

In number 2, enter the original report name in which the site-specific data can be verified. Include the date of the report, monitoring well number used to determine the groundwater depth, and the page number or table name where the information appears.

In number 2 (parameter table), enter the depth to groundwater from the monitoring well with the highest benzene concentration from the most current sampling event. The depth to groundwater shall be entered (in feet) from the top of casing (installed at ground level). If benzene is not present, then enter the depth of groundwater from the monitoring well with the highest MtBE concentration (and so forth in this order – toluene, total xylenes, ethyl benzene, naphthalene, PAHs).

Comparison of COCs to SSCLs

Upon completion of numbers 1 and 2, click the “Calculate On-site SSCLs” button to generate a table of SSCLs for all soil and groundwater COCs that failed the RBCL comparison in the RBCL Report. (Note: For any soil COC that fails the referenced comparison, a SSCL is generated at each sample depth for that particular COC, not just for the sample depth that failed the RBCL comparison.) The “Below SSCLs Y/N” column of each table displays the results of the comparison between the applicable SSCL and Maximum Soil/Groundwater concentration data. “Yes” indicates that the COC concentration is lower than the applicable SSCL. “No” indicates that the COC concentration is at or above the applicable SSCL. The SSCLs will also be used for the comparison on the Summary page.

4. Off-site SSCL Report

The site-specific data input into the On-Site SSCL Report and Off-Site SSCL Report will be used to determine whether the RBCLs and/or On-Site SSCLs are protective of any applicable off-site receptors. If the levels are not protective of the off-site receptors, then a back calculation will be performed to determine what concentration may be left on-site to be protective of human health and the environment for all applicable receptors. The calculations to determine the SSCLs are based in part on the Domenico Fate and Transport model.

To perform the calculations on the Off-site SSCL Report, the appropriate "Soil Type" (i.e. On-site, Vadose Zone, and Capillary Fringe) boxes shall be clicked on the "On-site SSCL Report". If these tasks have not been performed, then complete the referenced portion of the On-site SSCL Report before proceeding to the Off-site SSCL Report page.

Domenico Model Input Parameters

Enter the hydraulic gradient. The hydraulic gradient shall be based on data collected during the most recent groundwater gauging event.

Enter the Icover. Icover represents the percent of the soil contaminant plume that is covered by pavement, concrete, buildings, etc. The percent shall be entered as a decimal. For example, if the Icover is 80%, then enter 0.80. Note: 95% is the maximum allowable Icover.

Source width

Enter source width(s) and distance(s) to receptor(s).

Soil and/or groundwater plumes may not be fully delineated. In this case, extrapolation and/or interpolation techniques shall be used to determine plume widths to laboratory detection limits.

Enter the groundwater source width perpendicular to groundwater flow (in centimeters). The source width shall be selected based on benzene concentration. If benzene is not present, then enter the width based on MtBE concentration (and so forth in this order – toluene, total xylenes, ethyl

benzene, naphthalene, PAHs). If groundwater concentrations are encountered in only one monitoring well, then a source width of half the distance between this well and the next downgradient well shall be used.

Enter the soil source width parallel to groundwater flow direction (in centimeters).

The source width shall be selected based on benzene concentration. If benzene is not present, then enter the samples with the highest MtBE concentration (and so forth in this order – toluene, total xylenes, ethyl benzene, naphthalene, PAHs). If soil concentrations are not encountered above laboratory detection limits or are encountered in only one soil boring, then a source width of five (5) feet shall be used.

Enter the distance from the monitoring well with the maximum concentration to each applicable receptor (in centimeters). Receptor evaluations are limited to the following distances:

- Water supply well – within one-half mile radius
- Surface water (drinking supply) – within one-half mile radius
- Surface water (organisms only) – within one-tenth mile radius
- Residence – within one-tenth mile radius

Enter the original report name (i.e., source document), date and page number from which the hydraulic gradient (i), Icover, groundwater source width (Sw) perpendicular to groundwater flow direction, and soil source width (W) parallel to groundwater flow direction can be verified.

Comparison of Off-Site Concentrations to RBCLs

Upon completion of the data entry, click the “Calculate Off-site Concentrations” button to generate a table that provides:

- The modeled maximum groundwater contaminant concentration at the receptor;
- The RBCL for the applicable receptor;
- The results of the comparison between the modeled concentration at the receptor and the applicable RBCL (displayed in the “Below RBCLs Y/N” column). “Yes” indicates that the modeled COC concentration at the receptor is lower than the applicable RBCL. “No” indicates that the modeled COC concentration at the receptor is at or above the applicable

RBCL. If any modeled COC concentration fails the RBCL comparison, then “No” will be displayed; and

- The contaminant concentration level that may be left on-site to be protective of human health and the environment. This level was determined by performing a back calculation from the receptor back to the source. The results are displayed in the “Offsite SSCL” column.

5. Summary

The Summary sheet compiles the data generated by the RBCL, On-site SSCL, and Off-Site SSCL Reports, and provides the maximum SSSR that can be requested.

Soil

The summary page displays a table for soil that indicates the COC, the applicable RBCL, the final calculated on-site SSCL (if any), and the maximum soil SSSR concentration. A comparison of the concentrations is performed to determine which levels are protective of all on-site and off-site receptors, and displays the result in the “Maximum soil SSSR concentration” column. The COC concentration that appears on the RAR in the white shaded box represents the maximum soil concentration that may be requested as the SSSR.

Groundwater

The summary page displays a table for groundwater that indicates the COC, the applicable RBCL, the final calculated on-site SSCL (if any), the final calculated off-site SSCL (if any), and the maximum groundwater SSSR concentration. A comparison of the concentrations is performed to determine which levels are protective of all on-site and off-site receptors, and displays the result in the “Maximum groundwater SSSR concentration” column. The COC concentration that appears on the RAR in the white shaded box represents the maximum groundwater concentration that may be requested as the SSSR.

Eligibility of Site for Risk-Based Closure

If the site is eligible for a risk-based closure, then the Division will establish a closure-monitoring schedule.

If the results of the comparison indicate that any COC concentration exceeds the on-site and/or off-site SSCLs, then additional measures, which may be a combination, shall be proposed in the ISCR. Options include, but are not limited to: advanced site characterization, additional assessment of the volatilization to indoor air pathway by conducting a soil gas survey, source removal, risk reduction, institutional controls, engineering controls, advanced risk-based model, or a Corrective Action Plan. These options shall not be pursued until directed by the Division. Any work performed with the implementation of any option without prior Division approval may not be fund reimbursable.

G. Source Removal

A Source Removal includes excavation of all accessible soil that has been identified above the approved SSCLs, followed by proper disposal of excavated soil. A Source Removal proposal shall be submitted as required by the Division, and Division approval in writing is required prior to implementation.

H. Institutional Controls

Institutional controls are legal or administrative mechanisms designed to limit, prohibit, or condition the use of, or access to, a site or facility to eliminate or minimize potential exposure to chemicals of concern. Examples include restrictive covenants, environmental covenants, easements, and zoning¹. A proposal shall be submitted as required by the Division, and approval in writing is required prior to implementation of any institutional control(s).

I. Engineering Controls

Engineering Controls are physical modifications to a site or facility to reduce or eliminate the potential for exposure to chemicals of concern in the soil or groundwater on a property. Examples include capping, slurry walls, or point-of-use water treatment². A proposal shall be submitted as required by the Division, and approval in writing is required prior to implementation of any engineering control(s).

1 ASTM International. (2025). *Standard Guide for Moving Sites to Closure (MStC) for Petroleum Underground Storage Tank (UST) Releases*. (ASTM E3488-25).

2 Ibid.

J. Advanced Site Characterization

ASC is generally conducted following approval of an ISCR and SSCLs and only for those that site conditions and lithology are conducive to one or more of the below listed technologies and only as required by the Division. The requested proposal(s), field work, and subsequent reporting shall be in accordance with a schedule provided and/or approved by the Division.

1. High Resolution Site Characterization (HRSC)

The purpose of the HRSC can include but not be limited to:

- Delineating free product, including residual free product,
- Delineating sorbed or dissolved phase petroleum contamination,
- Assist with identifying lithologic variability related to mass storage and transport.

HRSC implementation plans shall include but not be limited to:

- Points adjacent to monitoring wells with free product and/or COCs above SSCLs,
- Soil borings with COCs above SSCLs,
- Surrounding the entire UST system at increments of 15 ft, and
- A grid pattern extending out from any previous point with data indicating free product or petroleum contamination.

Whenever possible, total depths of the points shall extend beyond the total depth of a monitoring well with free product measured and/or COCs above SSCLs. The total depth will be dependent on site-specific conditions including lithology.

2. High Density Soil Sampling (HDSS)

The purpose of the HDSS can include but not be limited to:

- Delineating sorbed or dissolved phase petroleum contamination,
- Identifying specific depths at which petroleum contamination exists,
- Identifying lithologic variability related to mass storage and transport.

HDSS implementation plans shall include but not be limited to:

- A grid pattern extending out from any previous point with data indicating petroleum contamination, typically placed 15 feet apart.
- Based on observations of the subsurface during the installation of initial points, step-in locations at approximately 7.5 feet from the initial borings may be necessary to fully delineate the area(s) of concern.

The total depth of the borings will be dependent on site-specific conditions including but not limited to zone of saturation, depth of known contamination, OVD readings, refusal, etc.

3. Remedial Design Characterization (RDC)

The purpose of the RDC can include but not be limited to:

- Evaluate soil and groundwater conditions to obtain sufficient information to determine the feasibility of in-situ application for remedial technologies.

RDC implementation plans shall include but not be limited to:

- Placing points (typically in a grid pattern) in areas of known soil and/or groundwater contamination where in-situ application for remedial technologies is anticipated to be applied.
- Soil borings are sampled continuously in a specified range of depths based on site specific conditions.
- Groundwater samples are collected from all or some of the existing monitoring and/or recovery wells based on site specific conditions.
- Samples are analyzed for parameters specific to in-situ application for remedial technology performance.
- Borings may be advanced into bedrock based on site specific conditions.
- For bedrock application, surface geophysics and/or subsurface geophysics may be completed prior to in-situ application.

The total depth of the borings will be dependent on site-specific conditions including but not limited to zone of saturation, depth of known contamination, OVD readings, refusal, etc.

K. Soil Gas Survey

The purpose of soil gas sampling is to evaluate the completeness of the volatilization to indoor air pathway for sites that have completed a risk assessment, have SSCLs approved by the Division, and have soil and/or groundwater contaminant concentrations that exceed the approved SSCLs that is not driven by another pathway and receptor. Soil gas sampling may be performed on other sites as directed by the Division. Soil gas sampling is not applicable if soil contamination that exceeds the SSCLs is shallower than three (3) feet from the ground surface or if the static groundwater level is within three (3) feet of the ground surface at the time of the SGS.

Any variations/deviations of these procedures require prior written Division approval.

Source Identification

Determine the location(s) where COC concentrations exceeded the approved SSCLs for soil and/or groundwater. These locations represent the source area(s). If soil and/or groundwater contaminant concentrations exceed the approved SSCLs in distinct and separate areas, then each source area shall be treated as separate sources and evaluated with separate soil gas probes.

Receptor Identification

Identify on-site buildings and determine their foundation types. If no buildings are currently located on the site, then for the purpose of evaluating risk, assume that a basement building will be constructed directly above the identified source area(s). Any variations/deviations of these procedures require prior written Division approval.

Soil Gas Probe Location, Construction, and Installation

Location and Number of Soil Gas Probes (probes)

Prior to proposing soil gas probe location(s), local city and/or county zoning officials shall be contacted to delineate the site-specific building setback requirements pursuant to current zoning restrictions, utility easements, rights-of-way, access to or from the property, etc. Probes shall not be located within the building setback areas except when placing perimeter probes, where necessary, around an existing onsite structure located within these setback areas (i.e., grandfathered structure).

Probes should not be installed within forty-eight (48) hours of a significant precipitation event [e.g., one-half (0.5) inch or more of rain within a twenty-four (24) hour period]. If the proposed date of the soil gas survey changes, then the Division must be given adequate notification of the new date. Probe locations should be adequately distributed to allow accurate characterization of soil gas concentrations adjacent to receptors and in the source area(s). The actual number of probes necessary for a given site will depend upon the size and number of existing receptors/structures, and the location of the receptors/structures relative to the soil and/or groundwater contamination. Probe locations and number shall be based on the following criteria:

Source Area(s)

Up to four (4) probe(s) may be installed in the source area. Source area probes shall be located immediately adjacent to any sample location where maximum soil and/or groundwater contaminant concentrations exceed the approved SSCLs. Soil gas sampling is not typically required in man-made pathways unless there is a specific concern regarding contamination.

Receptors

Up to seven (7) probe(s) may be installed adjacent to existing or potential structures. Receptor probe location(s) shall be either three (3) feet from a slab-on-grade structure, or five (5) feet from a structure with a basement or crawl space foundation. Receptor probes should be located along the side of any existing structure that is adjacent to, and/or immediately hydraulically down gradient from, soil or groundwater contamination. If any wall of a structure exceeds fifty (50) feet in length, then a minimum of two (2) sampling points are required along that wall. If no structure is present, then for the purpose of evaluating risk, assume that a basement structure will be built above the source area. The future structure shall be evaluated by locating the points in accordance with the Source Area section above. However, if a structure cannot be constructed above the source area because of existing zoning restrictions, utility easements, rights-of-way, access to or from the property, etc., then contact the Division case manager for guidance.

Subsurface Utilities

One (1) probe may be installed adjacent to each utility trench (e.g., water, sewer, electric, etc.) that crosses the source area(s) and then intersects a structure, thus providing a potential vapor pathway to the structure. The probe location shall be approximately three (3) feet from the utility trench and at least three (3) feet from a slab-on-grade structure or five (5) feet from a basement or crawl space foundation. The probe shall not be installed in the utility trench backfill. If no subsurface utilities provide a vapor pathway between the source area and a structure, then probes are not required near utility trenches.

Probe Installation – Maximum Depth

The depth of each soil gas probe shall be consistent between sampling locations. Probe depth shall be based on the type of receptor/structure that is present.

- If the only receptors being evaluated are slab-on-grade or crawl space structures, or if no structure is currently present, then the probe depth at each sample location shall be three (3) feet.
- If a receptor with a basement is being evaluated, then a probe shall be installed for each sample location at a depth of three (3) feet and ten (10) feet, respectively. If groundwater is encountered at a depth between five (5) and ten (10) feet, then an additional probe shall be advanced to, and sampled at, a depth of two (2) feet above the groundwater surface.

Probe Installation Specifications

Locating Utilities

Prior to probe advancement activities, a private utility locate shall be completed for the entire property if not previously conducted. Utility clearance shall also be obtained by contacting Tennessee 811 Call (TN One Call) and all applicable utility companies.

Probe Construction Materials

The materials used shall not interact with petroleum vapors. Typical installation materials are steel or stainless steel. Probe tips are typically stainless steel and provide for a removable screen mesh that is inserted between the probe tip and drive rod prior to installation. For sites that have clay soils, the screen may not be necessary and if used, may interfere or prevent the drive rod and probe tip from separating when the drive rod is extracted.

Decontaminating Materials

Prior to probe installation, all metal portions of the soil gas probe shall be thoroughly cleaned in accordance with the decontamination protocols specified in [section VI.B.16](#) Decontamination Procedures. All new metal probe components shall be cleaned prior to sampling.

Tubing

Nylon tubing with an outside diameter no greater than 3/8-inch and no less than 1/8-inch shall be used to connect the probe point to the sample train. If necessary, reducer fittings may be used to connect the tubing to the sample train. The portion of tubing extruding from the top of the soil gas boring should be between one (1) and two (2) feet in length.

Surface Seal

A surface seal of clean, petroleum-free modeling clay, or hydrated bentonite with a consistency of modeling clay, shall be made between the ground surface and the tubing and/or drive rod.

Probe Advancement Technologies

Probes may be installed using either a direct push method or a hand-driven method such as a rotary hammer or a slide hammer. Completion of the sampling point shall vary with the chosen installation technique as described below.

- **Rotary Hammer Drill Kit** – An electric powered rotary-hammer drill may be used to drive an expendable probe point to the target depth. Prior to advancing the probe, new rigid tubing shall be attached to the expendable point holder and threaded through the drive rod. The tubing will be advanced through the drive rod as the rod is advanced. The expendable probe point shall be a slightly larger diameter than the rod. All connections shall be air-tight. After advancing the probe point to the target depth, the drive rod shall be retracted three (3) inches.
- **Direct Push Technology** – Direct push may be used to push an expendable or retractable probe point to the target sampling depth. Generally, this technology should only be utilized if site conditions warrant the use, specifically points installed at 10 feet. If expendable probe points are used, then the points shall be of similar diameter to the drive rod to prevent creating a void space between the probe point and the wall of the soil boring. After advancing the probe point to the target depth, the drive rod shall be retracted three (3) inches. An adapter shall be connected to the rigid tubing and then advanced through the drive rod and securely threaded to the probe point. If the design utilizes O-rings, then all O-ring seals between the expendable probe point and the probe point holder, and/or between the probe point holder and probe point holder adaptor, shall be replaced between soil gas sampling locations. All connections shall be air tight. Retractable probe points may be used with direct push technology provided the probe point is not of a greater diameter than the drive rod, and provided the retractable point is thoroughly cleaned between probe installations.
- **Slide-hammer** – Slide-hammer installation may be used in areas inaccessible by power driven techniques. A hammer drill may be used to drill through asphalt, concrete, or other impenetrable surface material prior to use of the slide-hammer. A steel drive rod hammer is inserted into a 6-foot piece of clean, half (1/2)-inch diameter metal conduit. The referenced conduit should be constructed of thin-walled galvanized steel instead of plastic, which may collapse during the driving process. The

drive rod diameter shall be slightly smaller than the inside diameter of the conduit. The drive rod shall extend a minimum of three (3) inches below the bottom of the conduit so that when the conduit is advanced to the target depth, removal of the drive rod leaves at least a three (3) inch section of soil open for soil gas to migrate into the conduit. A short piece of flexible tubing should be clamped to the top of the conduit after the slide hammer drive rod is removed. The sample train should then be connected to the tubing using a reducer. All connections shall be air tight.

- Other methods as approved by the Division.

Sample and Purge Assembly

The configuration of sample trains, including the layout of the regulator, vacuum gauge, and purge equipment, shall conform to the photograph provided in Figure 1 using a SUMMA® canister. Alternate configurations will require prior approval from the Division. Plastic quick connect fittings and new nylon tubing shall be connected in such a manner to ensure a vacuum tight system. A separate sample train is required for each probe location. No above ground equipment, except the purging device, can be re-used between sample collection locations.

Sample Train – A separate, one-time use, tubing train, constructed of rigid 1/4-inch outside diameter nylon tubing and plastic quick connect fittings, shall be provided for each probe location. Swagelok® fittings can be used to connect the purge and/or sample collection device to the rigid tubing. Alternatively, flexible tubing segments may be used and should be no longer than two (2) inches to reduce the possibility of collapsing the flexible tubing during purging and sample collection. A shorter piece of flexible tubing will also reduce the likelihood of the tracer compound permeating the flexible tubing. If possible, the components that are inserted into the flexible tubing should be inserted so that the components are almost touching. It is recommended that all sample trains be assembled prior to arrival at the site to avoid potential cross contamination. All tubing trains shall be discarded between sampling locations to prevent cross contamination. Vinyl tubing shall not be used.

Purge System – The purge system, which is connected to the sample train, shall consist of a vacuum pump, vacuum regulator (if necessary), and a vacuum gauge. The vacuum pump shall be a hand pump that can be manually regulated. The regulator for the vacuum pump shall not be the same regulator that is attached to the sampling device. The purging flow rate shall not exceed 200 mL/minute.

Sample Collection Equipment – A dedicated, lab supplied, sample collection container and regulator shall be used for each sample location. The sample collection container is typically a 1-Liter SUMMA® canister. The laboratory shall supply a minimum of 2 additional sample collection containers and regulators in case a malfunction with a sample collection container or component occurs. Examples of specific equipment failure are SUMMA® canisters that have lost vacuum, regulators that malfunction, and/or vacuum gauges that are not functioning properly. If a malfunction is suspected after initiating sample collection, then continue to collect the sample for a maximum of 30 minutes and then repeat the sample collection process with a new sample train and sample collection container.

Surface Completion for Subsequent Sampling Events

In most applications, soil gas probes will be abandoned the same day they are installed.

In the event subsequent sampling events are deemed necessary, a proposal shall be provided to the Division for approval and shall include how the probes may be properly secured, capped, and completed to prevent infiltration of water or ambient air into the subsurface and to prevent accidental damage or vandalism. At a minimum the following shall be proposed or a variance request with justification provided:

- Plastic quick connect stopcock for capping the vapor tubing; and
- Protective flush mounted or aboveground well vaults.

Probe Abandonment

After obtaining the soil gas sample at each sampling location, all equipment that can be removed from each sample location shall be removed. If the tubing cannot be removed, then it shall be cut flush with the surface and plugged to prevent surface water infiltration. The probe boring shall be filled with powdered bentonite to the maximum extent practicable and then hydrated. If the probe is installed through asphalt or concrete, then asphalt or cement grout may be used to finish the upper six (6) inches of the probe boring.

Purging, Vacuum Testing, Tracer Application, and Sample Collection

Probe and Sample Train Purging

Prior to obtaining a soil gas sample, the probe and sample train shall be purged to ensure that the collected soil gas samples are representative of subsurface conditions. The following purge procedure shall be followed:

- 1) Use a pair of new disposable latex gloves before handling any equipment, tubing, etc.
- 2) Complete all above ground connections from the probe and sample train to the vacuum system, regulator, and sample container.
- 3) Calculate the volume of the sample train by summing the volume from the probe tip to the purge and sampling device.
- 4) Purge the system until a minimum of three system volumes have been evacuated. Purging should be conducted at low flow rates (i.e., 200 mL/minute or less) and be under vacuum conditions similar to those used during sample collection. A purging flow rate of 200 mL/minute or less, will reduce the potential of stripping volatiles from the soil and/or groundwater and will reduce the likelihood of drawing ambient air into the sample train.

Vacuum Testing

Leakage resulting from loose fittings, etc., during soil gas sampling may decrease or increase sample analytical concentrations. A decrease in sample concentrations can occur when ambient air enters the sample system, whereas an increase can occur when external contaminants enter the sample system. Therefore, to ensure the integrity of the sample results, a vacuum test shall be performed each time a soil gas sample is collected. The procedures required to perform a vacuum test are listed below.

- 1) Complete system purging in described previously.
- 2) With the stopcock closest to the probe closed, perform a vacuum test on the sample train. Apply a minimum of ten (10) inches of mercury vacuum on the sample train. A passing vacuum test occurs if no vacuum loss is observed after two (2) minutes.
- 3) If the test fails, then check/repair connections, re-purge the system, and retest the system until a passing vacuum test result is obtained. Replace the sample train if repeated vacuum tests fail.

Tracer Application

In addition to the vacuum test, the application of a tracer shall be performed each time a soil gas sample is collected to help ensure the integrity of the sample results. The procedures required to apply a tracer are listed below.

- 1) Isopropanol (70 % rubbing alcohol) shall be used as a tracer to determine if leaks are present in the soil gas sampling system.
- 2) After performing the vacuum test described above and immediately before obtaining the sample, loosely apply a new paper towel around the tubing where it exits the ground surface.

- 3) Lightly dampen the paper towel with the tracer. Do not saturate the paper towel. Use a small spray bottle or syringe to apply a minimal amount of liquid tracer. Do not pour the tracer directly from the bottle onto the paper towel.
- 4) Replace the latex gloves used to apply the tracer with a new pair of latex gloves, before proceeding with sample collection.

Sample Collection

If the soil gas samples are analyzed using an off-site fixed laboratory, then samples shall be collected in a 1-liter or smaller sample canister (e.g., a SUMMA® canister or other approved, metal sample collection device). The laboratory providing the sample containers shall certify that the sample containers and flow regulators are free of contaminants.

Sample Collection Flow Rate – If sample canisters are used to obtain the soil gas samples, then a separate laboratory-supplied regulated flow meter shall be utilized to control sample flow rates. A different laboratory supplied flow regulator shall be used for each sample location. The flow regulator shall be placed in accordance with Figure 1 below, and the sample collection flow rate shall not exceed 200 mL/min for each sample location. The lab will specify the sample collection time necessary to fill the sample container. The minimum draw time preset by the laboratory for this procedure shall not be less than five (5) minutes. The maximum draw time preset by the laboratory for this procedure shall not exceed thirty (30) minutes.

Sample Collection Order – Soil gas samples shall be collected in the following order.

- Start at the location assumed to have the lowest soil gas contaminant levels,
- Followed by the location assumed to have the second lowest concentrations, and so forth, ending with the sample location assumed to have the highest soil gas contaminant concentrations based on in-situ concentrations.

Sample Collection Procedure

- 1) Open the probe and vacuum stopcock and perform purging as required. After purging, close the probe stopcock.
- 2) If water droplets are observed inside the sample train during the purging or sampling process, then stop sample collection and note the presence of water. Sample locations with water are not acceptable.
- 3) Complete vacuum testing as required.
- 4) Apply paper towel and tracer.
- 5) Replace the latex gloves used to apply the tracer with a new pair of latex gloves, before proceeding with sample collection.

- 6) For sample canisters, open the probe stopcock and then open the sample valve on the canister to allow the soil gas sample to be collected. After the sample collection time provided by the lab has lapsed, close the sample valve and disconnect the sample canister. Immediately label the canister with sample identification information. Clearly identify samples collected from source areas or any other sample location where indication of high concentrations is suspected and/or known. Use a ballpoint pen for labeling. Do not use a pen or marker that contains alcohol or other volatile chemicals.
- 7) Store all sample containers out of direct sunlight and do not chill.
- 8) All personnel are to use new disposable gloves for each sample collection location to prevent possible cross-contamination.
- 9) Proceed to the next sample location and repeat steps above
- 10) One field duplicate sample is required for each sampling event. Following the same sampling protocol detailed above, the duplicate sample shall be collected at the sample location presumed to have the highest soil gas contaminant concentrations.

Laboratory Analysis

Samples shall be transported via ground carrier and not shipped on ice or in a refrigerated container.

Sample Parameters

The following parameters will be analyzed for all samples collected during the survey

- Only the COCs that **exceeded** the approved site-specific standard.
- Leak Tracer Compound: Isopropanol (2-Propanol, 70% rubbing alcohol)
- Biological Parameters: Oxygen and Carbon Dioxide

Analytical Methods

Fixed laboratory analysis for COC analysis using gas chromatography shall follow Method TO-15. If a different analytical method is deemed necessary, justification shall be provided and Division approval in writing shall be obtained.

All method detection limits must be below the applicable residential and/or commercial target concentrations listed in Table 1 Analytical Results of the Soil Gas Sampling Report.

Other laboratory methods may be used only if prior approval from the Division is obtained. Regardless of the selected laboratory method used, the laboratory detection limits for each COC must be lower than the applicable

residential and/or commercial target concentrations listed in Table 1
Analytical Results of the Soil Gas Sampling Report.

The laboratory shall provide adequate and complete Quality Assurance and Quality Control (QA/QC) data for each analysis. QA/QC data shall be developed in accordance with the provisions of the analytical method used.

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Figure 1 – Example Sample Train with 1-Liter SUMMA® Canister

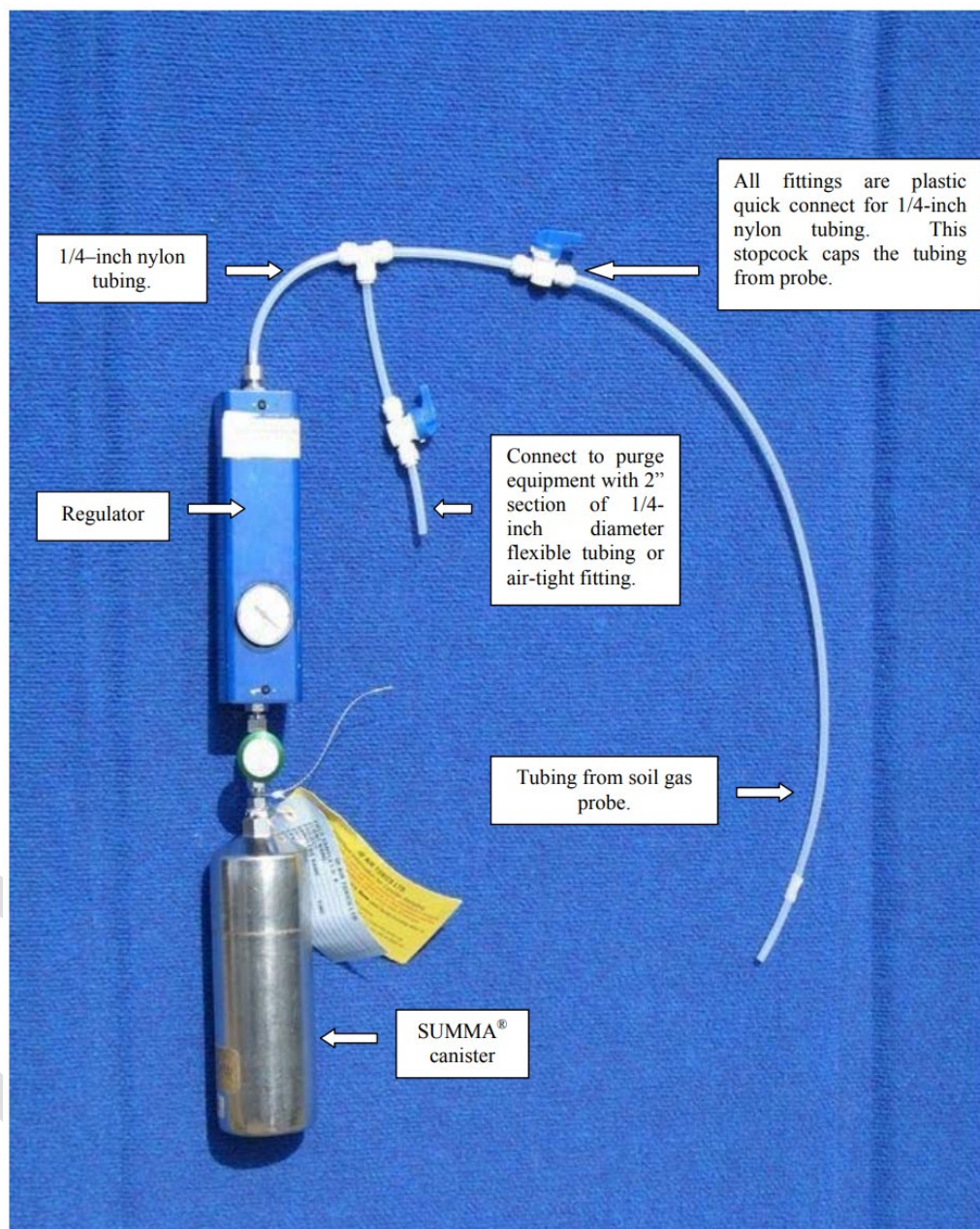


Figure 2 – Examples of Specific Equipment

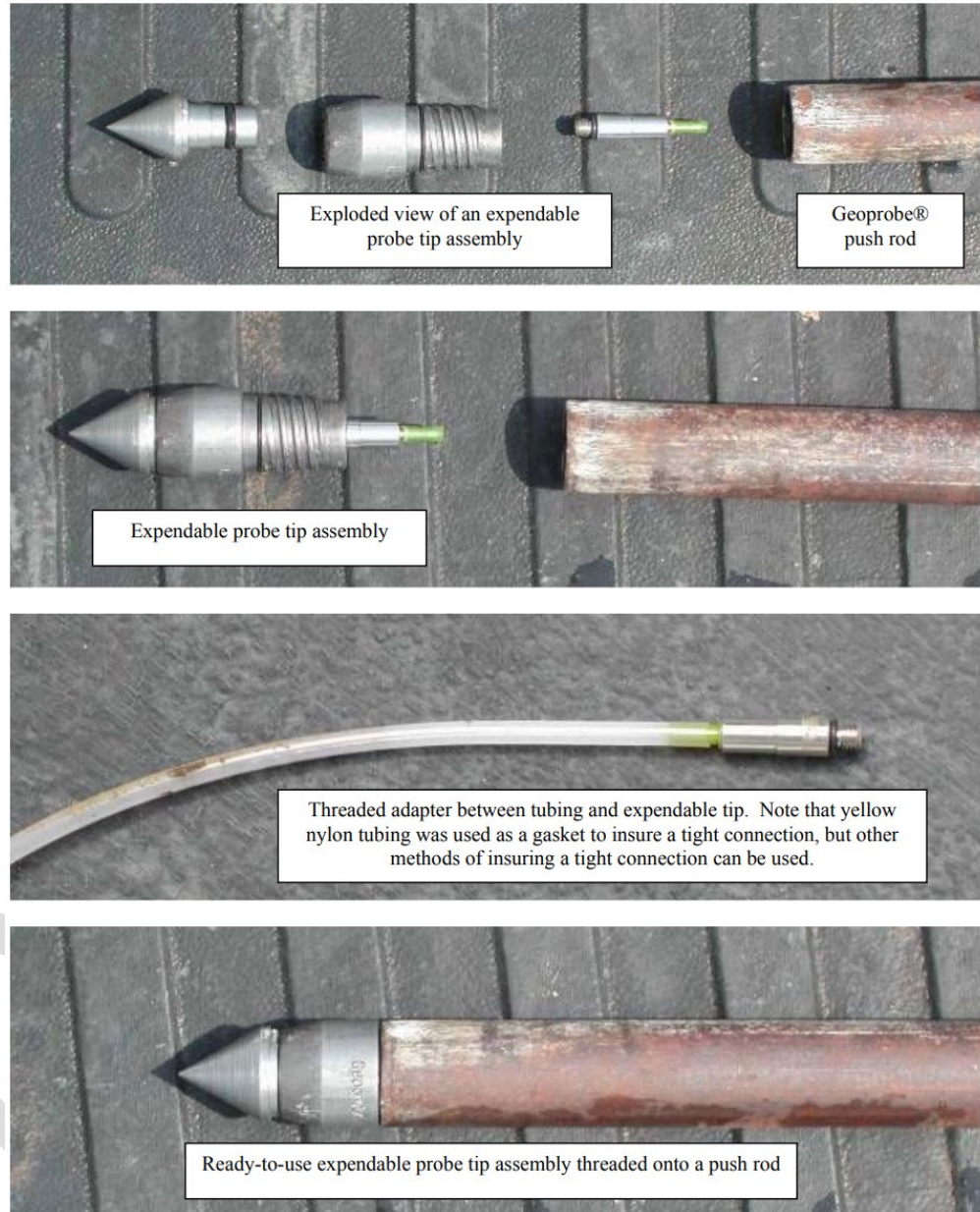


Figure 3 – Examples of Specific Equipment



L. Mobile Enhanced Multiphase Extraction

A MEME Application shall be submitted for an event with duration of eight (8) hour (MEME-OW) to twenty-four (24) hours (MEME-CAT), including a cost proposal in accordance with Rule 0400-18-01-.06. Dual-phase, high vacuum extraction events exceeding twenty-four (24) hours or multiple MEME events must be requested and pre-approved by the Division and in most instances be submitted as a part of a CAP.

Placement of Extraction Device(s)

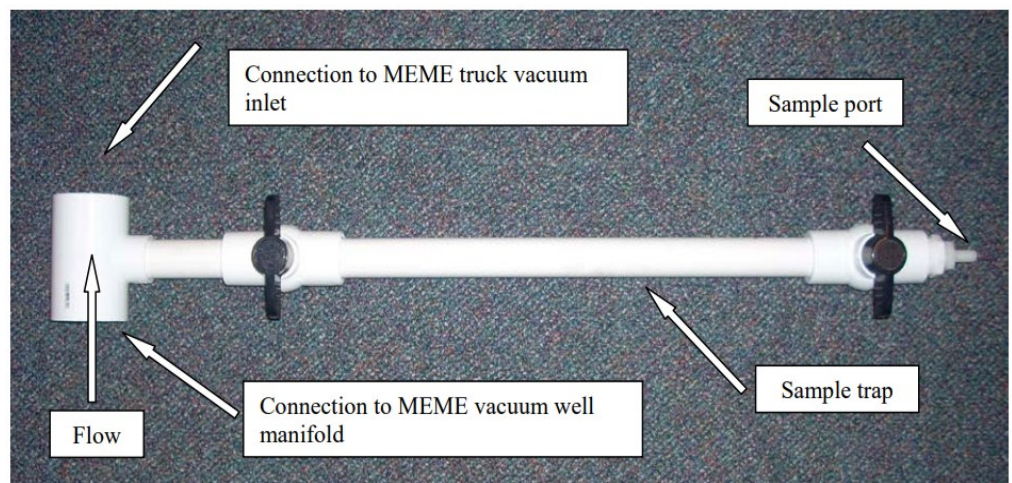
The volume of product, vapor, and water recovered greatly depends on the depth at which the extraction device is placed. Extraction device placement shall be based on the most recent aquifer data obtained prior to submitting the MEME Application. If the purpose of the MEME event is to extract free product, then appropriate adjustments to the extraction device depth shall be made during the MEME event to maximize free product removal.

MEME Event Specifications

The liquid recovery tank shall be empty of any liquid prior to beginning the MEME event. The MEME Field Log is an Excel® document and shall be used to record and report the field activities for the MEME event. During the MEME event, the parameters listed on the log shall be monitored at fifteen (15) minute intervals for the first two (2) hours and at thirty (30) minute intervals thereafter for the next six (6) hours. For MEME events exceeding eight (8) hours, subsequent readings shall be collected at four (4) hour intervals.

If an alteration in the event duration and/or monitoring interval is needed, then prior justification shall be submitted with the MEME Application.

During the twenty-four (24) hour MEME event, all extraction lines shall be manifolded. A trap with sampling port shall be installed on the MEME truck influent line after the manifold and prior to the MEME truck (similar to Example Sample Train, below). Sample trains shall be assembled prior to arrival at the site to avoid potential cross contamination with PVC solvent and/or glue. A new sample train shall be used for each MEME event. Prior to obtaining each influent water sample, the sample train shall be decontaminated using distilled water. Additionally, prior to collecting each water sample, the sample train shall be purged of fluids accumulated during the MEME event immediately prior to filling the trap with the water sample.



During the twenty-four (24) hour MEME-CAT event, an influent groundwater sample shall be collected, which will be utilized by the Division for internal calculations when a CAS is planned and not intended to be compared to cleanup levels. The sample shall be collected between the second and fourth hour of the MEME event. The groundwater sample shall be analyzed for BTEXMN by EPA Method 8260B. The concentration (emission) readings shall be collected at the designated sampling port of the system stack using an OVD (e.g. PID, FID, thermal conductivity meter, or other instruments approved by the Division prior to its use). The OVD must be capable of detecting the full range of the hydrocarbons being extracted. All instruments must be equipped with a condensate trap capable of removing moisture. The airflow rate shall be measured at the designated sampling port of the stack using a device capable of measuring velocity to an accuracy of +/- 5%. Vacuum readings on approved perimeter monitoring wells shall be recorded to determine the radius of influence. Do not alter units from what is listed in the field log as the data is utilized by the Division when a CAS is planned. If units (ft/sec, dry std ft³/min, ppm, and lbs.) are altered in the field log, then a final version shall be submitted with the correct units required.

At a minimum, water level readings in all monitoring/recovery wells shall be taken before and after the event.

Reporting Requirements

A MEME report shall be completed in the format required by the Division and submitted by the established deadline.

M. Pre Corrective Action Plan Meeting

A Pre-CAP Meeting between the Division, the CAC, and/or Responsible Party shall be completed prior to the submittal of the CAP and as required by the

Division. The meeting may either be held in person at the facility property, in person at an agreed upon meeting location, or virtually.

The following shall be provided to the Division a minimum of 72 hours prior to the meeting:

- Site map(s) with all previous sampling locations, including soil borings, monitoring wells, recovery wells, LIF points, and remedial design characterization sampling points. Site maps shall include all site structures and features, site utilities, UST system components, and any other subsurface structures.
- Horizontal Extent of Groundwater Contamination Map(s) depicting the horizontal extent of free product and/or the contaminant plume(s) for each of the applicable SSCLs. Only one applicable COC above SSCLs shall be submitted per map;
- Contour maps summarizing the data and geologic conditions to be used to evaluate potential corrective action;
- If applicable, proposed excavation maps depicting the extent and depth of all excavation areas.
- All boring logs, monitoring well and recovery well diagrams;
- If applicable, the number, location, depth, and screened interval of proposed recovery wells that will be needed (included on a site map)
- Historical free product occurrence;
- All potentiometric maps within the last one (1) year and only with data from all monitoring and recovery wells;
- Locations and concentrations of samples above SSCLs in soil and/or groundwater;
- Estimated radius of influence (groundwater drawdown and vacuum based on 24-hour MEME Event);
- Estimated extraction rate for groundwater (based on 24-hour MEME Event);
- Proposed CAS location;
- Proposed CAS size;
- Discharge method and location;
- Location where water is being discharged (i.e. stream, spring, culvert, etc.)
- Special considerations such as air assist or downhole pumps
- Electrical service available at the Subject property;
- Site obstructions (overhead and underground utilities, fences, buildings, etc.) and potential impact on installation of remediation system components;
- Permit Requirements (Air, Construction, Electric, NPDES, POTW, Other)
- Geologic considerations (if any) for dual phase vapor extraction as appropriate; and
- Any other information as requested by the Division or any other pertinent information necessary to effectively create a Corrective Action Plan.

N. Corrective Action Plan

In accordance with Rule 0400-18-01-.06(3), any confirmed release of petroleum product that results in concentrations of a COC above SSCLs requires corrective action unless otherwise directed by the Division. As directed by the Division, an RAR shall be completed prior to the submittal of a CAP to determine the applicable SSCL for each COC. Unless otherwise directed by the Division, if soil or groundwater contamination is above the applicable SSCLs, then complete the relevant portions of the CAP.

All geologic work specified in this document shall be overseen onsite by a licensed professional geologist in accordance with the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.), or a registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (T.C.A. §62-2-101 et seq.).

Unless otherwise directed by the Division, a registered professional engineer shall oversee all non-Fund covered release corrective action design specifications. This plan shall describe in detail the specifications of the corrective action technology/technologies and provide the rationale for not using the preferred Division technologies, when applicable.

Proposed corrective actions shall remediate and prevent further migration of the contaminant plume(s). Additionally, timely submittal of a CAP is required to minimize further migration of contaminant plumes.

IMPORTANT: Standard CAP technologies consist of soil excavation and/or dual phase vacuum extraction. Unapproved deviations involving technologies not consistent with soil excavation and/or dual phase high vacuum extraction will not be reimbursable for fund covered releases and may result in enforcement action. If other technologies are being considered, a CAP shall not be completed and/or submitted without prior evaluation and approval from the Division project manager.

The CAP shall be prepared and submitted in accordance with templates provided by the Division.

Unless instructed to do otherwise in writing by the Division, the approved CAP shall remain in effect until replaced by an approved modified CAP or until the existing CAP is terminated. Causes for modification of the approved CAP may include, but are not limited to:

- 1) Limited reduction of or an increase in contamination, free product and/or plume size;
- 2) Excessive down time of the CAS; and/or

- 3) Risk to human health, safety and/or the environment may have changed as a result of the discovery of new receptors or the elimination of existing receptors to such an extent that a revised RAR may be required by the Division.

Causes for termination of the approved CAP may include, but are not limited to:

- 1) Whenever all the following criteria have been met:
 - a. No petroleum vapors have been detected in above ground and/or subsurface structures for at least two (2) years;
 - b. Levels of COCs are below the applicable SSCLs for the site; and
 - c. No receptor has been impacted by contamination for the past two (2) years, or
- 2) The regulations in effect at the time that the CAP was approved have been amended and such amendments require modification or termination of the CAP; or
- 3) The CAS is not achieving the cleanup levels (SSCLs) in accordance with the performance measure criteria; or
- 4) An engineering/institutional control has been approved by the Division; or,
- 5) The corrective actions have accomplished the goal of adequate protection of human health, safety and the environment at the site and there is no longer a need for remediation.

Proposed Corrective Action Technology (CAT) – Soil (Excavation and/or Soil Vapor Extraction)

If soil contamination above the applicable SSCLs exists onsite, then state the proposed CAT that will most expeditiously and cost effectively result in a risk-based approved closure.

Excavation shall be the preferred method for soil remediation, unless the integrity of a structure would be compromised or other physical limitations will not allow excavation. In accordance with Rule 0400-18-01-.06(7), when considering excavation measures, if it is determined that a fixture on the property is preventing or impeding the utilization of a more cost effective approach to remediation at the site, then fixture removal and subsequent restoration or disposal of the original fixture may be considered. If applicable, then provide a cost comparison for the removal of any fixture including, but not limited to, tanks, lines, dispenser islands, dispensers, canopies, buildings, signage, asphalt and/or concrete related to the excavation, fixture disposal and/or restoration. In those instances in which fixture removal and restoration is approved by the Division in accordance with Rule 0400-18-01-.09(8)(a), then the restoration will be considered to be integral to site rehabilitation.

If excavation is not feasible, soil vapor extraction may be proposed as a Corrective Action Technology for soil remediation, but justification shall be provided.

A CAP proposing other soil remediation technologies shall not be completed and/or submitted without prior Division approval.

Proposed Corrective Action Technology (CAT) – Groundwater

The proposed CAT of choice shall be or include dual phase high vacuum extraction unless another method of extraction is approved by the Division. For fund covered releases, a CAS will be provided by the Division based on the specifications provided in the approved CAP.

If alternative groundwater remediation technologies are being considered, a CAP shall not be completed and submitted without concurrence in writing from the Division project manager either during or following a Pre-CAP meeting.

Available CAS equipment

The following available CAS equipment will be provided by the Division. Based on sizing criteria listed in this section, one of these systems will be selected for installation. The four standard CAS units are:

- If available, a 25-hp Oil Sealed Liquid Ring Pump (OSLRP) capable of extracting total fluids and air with a minimum of 20 inches of mercury vacuum capacity and a minimum air flow rate of 300 ACFM. This unit includes a horizontal AWS with a capacity of 200 gallons.
- If available, a 30-hp OSLRP capable of extracting total fluids and air with a minimum of 20 inches of mercury vacuum capacity and a minimum air flow rate of 375 ACFM. This unit includes a horizontal AWS with a capacity of 200 gallons.
- 40-hp OSLRP capable of extracting total fluids and air with a minimum of 20 inches of mercury vacuum capacity and a minimum air flow rate of 475 ACFM. This unit includes a horizontal AWS with a capacity of 200 gallons.
- 50-hp OSLRP capable of extracting total fluids and air with a minimum of 20 inches of mercury vacuum capacity and a minimum air flow rate of 600 ACFM. This unit includes a vertical AWS with a capacity of 300 gallons and may also include a full featured soft start to control inrush current of the 50 hp motor.

Standard CAS components

All CAS units are equipped with the following:

- An Oil/Water Separator (OWS) with a minimum flow-through capacity of fifteen (15) gallons per minute (gpm);
- An air stripper with a minimum flow-through capacity of fifteen (15) gpm;
- Intra-system transfer pumps with a minimum 1.5 hp pump to transfer extracted fluids between major system components;
- Schedule 80 Poly Vinyl Chloride (PVC) piping, fittings and cleanouts including unions and PVC ball valves. Explosion proof (XP) systems are equipped to meet local requirement provisions for above ground carbon steel piping and fittings;
- A National Electric Manufacturers' Association (NEMA) 4, intrinsically safe, master control panel;
- Standard units are equipped with Class 1 Division 2. For XP units, a Class 1 Division 1 unit is available;
- A digital telemetry system equipped with battery backup with remote restart and shutdown capability;
- A 12,000 BTU XP heater and thermostat;
- A skid-based building (8' x 12' or 8' x 16') with structural steel base and supporting steel cross members and locking steel door. The base includes forklift pockets and lifting rings for crane use. An XP interior light, ventilation, and fire extinguisher are included;
- Two (2) bag filter stainless steel housing units in parallel with integrated bypass piping;
- Two (2) granular activated carbon (GAC) canister assemblies in series with integrated bypass and backwashing piping shall be used at start-up (considered to be the first three (3) months of CAS operation). System performance will determine when these components may be bypassed;
- A mechanical totalizing flow meter;
- A 1.5 hp discharge transfer pump; and,
- Division 1, XP, City of Memphis package systems will be the same as above, except: installed with Class 1, Division 1 interior motor and building wiring, steel secondary containment under building, 4-inch curb around the interior of the building, leak detection in building, ball valve drain and NFPA 704 placard.

Optional CAS Equipment

Only when approved by the Division, additional CAS equipment may be provided. A justification shall be provided for each situation.

Free Product Tank

If free product is present, then a 300-gallon free product tank can be requested.

Catalytic Oxidizer

If occupied residences and/or active businesses are within close proximity to the proposed CAS location, then a catalytic oxidizer can be requested if the CAS location is inadequate.

All other requirements for the CAP are included in plan and table templates.

Phase Converter

If deemed necessary due to electrical phase availability, a phase converter can be requested.

Extraction Well Specifications

Unless otherwise approved by the Division, all extraction well manifolds and extraction well vaults shall be constructed using the dimensions and materials specified in the CAS Figure Packages using the applicable "Wellhead Manifold and Well Vault" figure. All extraction wellheads shall be properly sealed to maintain the designed vacuum and shall be enclosed within the extraction well vault. The metal vault shall be able to withstand traffic consistent with the type of facility and shall be secured with a lock or bolt down mechanism.

One (1) inch to one and a quarter (1.25) inch diameter flexible PVC, petroleum resistant, vacuum rated (28 inches of Hg), reinforced tubing shall be used down well as an extraction drop tube (stinger) during CAS operation. The total length of the tubing required shall extend to the total depth of the extraction well (including a few extra feet for adjustment). Follow the CAS Figure Packages using the applicable "Wellhead Manifold and Well Vault" figure. The end of the tubing shall be adjusted at start-up to optimize CAS free product removal, groundwater extraction and vacuum influence.

Piping Trench and Manifold Specifications

Unless otherwise approved by the Division, all piping trenches shall be installed in accordance with the dimensions and construction materials specified in the CAS Figure Packages, using the applicable "Wellhead Manifold and Well Vault" figure. All extraction (or "recovery") and contingent piping shall be a minimum of two (2) inches in diameter. All trenches installed for

extraction piping shall include a single truncated contingent piping into each extraction well vault. If simple vacuum extraction is not sufficient based on MEME data (i.e. elevation difference between inlet pipe for CAS and groundwater is greater than forty (40) feet), then a minimum three quarter (3/4) inch air assist line shall be included within the piping trenches to each extraction well.

The CAS inlet piping manifold is to be installed outside the CAS concrete pad. The manifold shall be connected to the CAS using 4-inch PVC piping, unless otherwise required by local code. Unless otherwise approved by the Division, the CAS piping manifold shall be constructed in accordance with the dimensions and construction materials specified in the piping manifold layout located in the CAS Figure Packages using the applicable "CAS Inlet Piping Manifold" figure.

CAS Positioning and Concrete Pad Specifications

Positioning of the CAS shall include, but not be limited to, considerations of exhaust fan location, liquid ring discharge and air stripper venting system in proximity to buildings proximity to overhead utility lines, obstructions (accessibility of CAS system delivery vehicle to concrete pad location and access to removable panels and door); and/or State and local codes (i.e., setbacks, right of ways, easements, etc.) Consider store deliveries and traffic patterns for CAS placement.

The dimensions of the concrete pad for a 25-hp OSLRP, 30-hp OSLRP, or 40-hp OSLRP CAS is 10 feet wide, 14 feet long, and 4 inches thick. The dimensions of the concrete pad for a 50-hp OSLRP CAS is 10 feet wide, 18 feet long, and 4 inches thick.

Emergency Contact Sign

An emergency contact sign shall be displayed on the door of every CAS deployed at a site. The sign shall be prominently displayed on the CAS prior to startup and may be removed directly before CAS pickup from the site. At a minimum, the sign shall include the following information:

- An initial statement that reads " IN CASE OF EMERGENCY CALL", followed by;
- The phone number for the primary CAC contact;
- The phone number for the secondary CAC contact; and
- Both Statewatch phone numbers in this order: (615) 741-0001, and the toll-free number at (800) 262-3400.

CAS Startup Procedures

Initial CAS start-up is not approved for any Thursday through Sunday, state or federal holiday, or any day before a state or federal holiday. If a CAS is started up on any of these days, then the start-up activities may not be Fund reimbursed.

CAS start-up period is defined as the first three (3) months after the CAS has initially been placed online.

For Fund covered releases, CAS start-up activities shall, at a maximum, include daily activities during the first week of CAS operation and then weekly activities (once per week) for the first three (3) months of CAS operation. If during the first three (3) month monitoring period, additional site visits are justified, then a proposal including costs shall be submitted for Division approval.

On-site personnel shall inspect and document system performance. This includes, but is not limited to, the tabulation of gauge and meter readings, inspection for leaks, excessive equipment heat and noise, and equipment wear. On-site personnel shall perform routine and scheduled repairs during the site visit. Other routine activities may include but are not necessarily limited to checking extraction well pumps and components, checking filters, hoses, compressor oil, cleaning stripper (monthly), backwashing Granular Activated Carbon (GAC) vessels to remove fouling and iron buildup, and the replacement of gauges, lubricants, and belts. If a routine repair is needed but the CAS is still running, then the repair shall be completed during the next scheduled O&M visit.

Corrective Action Documentation

A Corrective Action System Installation/Activation Checklist (CASIACL) located in the Attachments of the Guidance Manual, shall be completed during the CAS installation and start-up activities. The CASIACL, and the completed CAS manufacturer's field start-up checklist shall be submitted with the CAMR-ab (with as-built diagrams).

A "Corrective Action System Entry Log" located in the "CAS Workbook", shall document all personnel that are on site to repair, service or observe the CAS. The log shall remain in the CAS at all times and be accessible. The log may be reviewed by Division staff for reimbursement verification purposes.

A Corrective Action System Field Log (CASFL) shall be completed during each site visit. This log shall be prepared in accordance with the CASFL located in

the "CAS Workbook" and submitted with the appropriate monitoring report in an attachment, unless directed to do otherwise by the Division. Any additional information unique to a system should be attached to the CASFL. The CASFL should be expanded to accommodate additional extraction and monitoring wells. The appropriate checklist (monthly checklist, quarterly checklist, or annual checklist) shall be completed based on the type of O&M being conducted during each site visit.

A Corrective Action System Repair Log (CASRL) shall be completed during each site visit related to CAS repair. The log shall be prepared and submitted in accordance with the CASRL located in the "CAS Workbook" and submitted with the appropriate monitoring report.

A Corrective Action System Down Report (CASDR) shall be submitted within three (3) business days of any system downtime that exceeds 72 hours in length (continuous downtime). The report shall be prepared and submitted in accordance with the CASDR located in the "CAS Workbook" and submitted with the appropriate monitoring report.

Telemetry

After CAS start-up, continuous telemetry monitoring shall be used to monitor system operation.

Routine System O&M and Schedule

After CAS start-up, routine CAS activities shall, at a maximum, be performed monthly. Routine O&M shall be defined as:

- Scheduling site visits as required to inspect and document system performance, as well as perform routine repairs or scheduled repairs;
- Inspecting for leaks, excessive equipment heat and noise, and/or equipment wear;
- Inspecting and documenting system performance which includes, but is not limited to, the tabulation of gauge and meter readings, inspection for leaks, excessive equipment heat and noise, and equipment wear, checking extraction well pumps and components, checking filters, hoses, compressor oil, cleaning stripper (monthly), backwashing GAC vessels to remove fouling and iron buildup, and the replacement of gauges, lubricants, and belts; and
- For Fund covered releases, an additional technician may be requested, but prior Division approval shall be obtained. If a technician leaves the site during the 10-hour workday to obtain repair

materials, then the time shall be included in the reimbursement application as on-site time for routine O&M.

CAS Repair Information and Documentation

Repairs to and/or maintenance of the CAS shall be performed in a manner that neither results in, nor contributes to, the spread of contamination or increases the risk to human health, safety and/or the environment. Repairs shall be completed on the day they are observed if at all possible. If the total cost for the repairs exceed \$3,800.00, then a cost proposal for the repair shall be completed and submitted with the CASDR. The worksheets shall include, but not be limited to, itemizing personnel time, installation costs, and capital equipment costs. The completed cost proposal shall be approved by the Division prior to making the repair.

Types of Corrective Action Monitoring Events

Monitoring events shall consist of one of the following:

Corrective Action Baseline Monitoring Event - Consists of sampling all monitoring and extraction wells and other Division approved sample locations within thirty (30) days prior to CAS start-up;

Corrective Action Comprehensive Monitoring Event - Consists of sampling all monitoring and extraction wells and other Division approved sample locations;

Corrective Action Monitoring Event - Consists of sampling only Division approved sample locations; or

Corrective Action Closure Monitoring Event - Consists of sampling only Division approved sample locations.

Land, Water Use and Receptor Monitoring, Sampling, and Well Assessment

This task shall evaluate changes in land, surface, and/or groundwater usage surrounding the site and shall be completed once per calendar year, unless directed otherwise by the Division. The discovery, addition and/or removal of receptors may change the basis upon which the applicable SSCLs were developed. The Division shall be notified of any receptor change within 72 hours. This task shall also include an assessment of the status of all monitoring and recovery wells to determine if any damage has been sustained and/or if repairs may be necessary. Provide the completed Well

Condition Table (located in the CAS Workbook) and photographic documentation of each well with the appropriate monitoring report.

Monitoring and Sampling

All new impacts identified during sampling shall require written 72-hour notification to the Division by submittal of a Hazard Notification Report (HNR). All measurements shall be collected while the CAS is in operation.

Soil monitoring shall consist of the installation of one boring in Division approved location(s) where the highest level(s) of soil contamination was (were) known to exist through previous site assessment activities. The soil sample(s) shall be collected every two (2) years from the implementation of the CAP, unless otherwise directed by the Division. The sample(s) shall be collected and analyzed in accordance with the current guidance for the appropriate COCs.

Water monitoring and sampling shall consist of obtaining water level measurements from all monitoring and extraction wells, obtaining free product level measurements from all monitoring wells, extraction wells, release detection wells and/or observation wells, if applicable, and sampling all Division approved monitoring wells and extraction wells in accordance with the current guidelines for the appropriate COCs.

CAS influent samples shall be collected prior to an O&M event. Samples shall be collected prior to the air stripper at the base of the AWS in conjunction with any required effluent sampling.

Types of Corrective Action Monitoring Reports

Corrective Action Baseline Monitoring Report (CABMR) - A onetime report that contains the sampling results for all monitoring and extraction wells and other Division approved sample locations and the data obtained from performing any other tasks. The report is to be submitted within thirty (30) days after baseline sampling.

Corrective Action Monitoring Report (CAMR-ab) with as-built diagrams - A onetime report after CAS start-up that contains the sampling results for only Division approved sample locations and the data obtained from performing any other tasks.

Corrective Action Monitoring Report (CAMR) - A report that contains the sampling results for only Division approved sample locations and the data obtained from performing any other tasks. The CAMR shall be submitted

quarterly for the first year of corrective action and semiannually thereafter, unless otherwise directed by the Division.

Corrective Action Closure Monitoring Report (CACMR) - A report that contains the sampling results for only Division approved sample locations and the data obtained from performing any other tasks. The CACMR shall be submitted quarterly for the closure monitoring period, unless otherwise directed by the Division.

Performance Measures, Triggers, and Contingency Actions

An evaluation of the CAT shall be conducted by the Person Assuming Responsibility (PAR) upon receipt of new field and analytical data. The Performance Measures (PM) of the approved CAP shall be the basis upon which to evaluate the effectiveness of the CAT. If the PMs indicate that the CAT is not accomplishing its goals, then the Division shall be notified within thirty (30) days of the PM evaluation in the appropriate monitoring report and consideration shall be given to the possible need for modification of the CAP.

PMs shall include, but not be limited to, the following:

- An estimate of down time for the CAS expressed as a percentage of total operating time;
- If free product exists at the site at the time of CAP approval or modification and free product removal is one of the remediation goals of the CAP, then both the long and short term objectives of free product extraction at this site shall be compared to actual site conditions for each monitoring period. As long as free product is present at the site, PMs related to these objectives shall be compared to the actual free product monitoring data after each monitoring event; and,
- An evaluation of the COC concentration trends in comparison to the approved SSCLs for each monitoring period.

In addition to setting PMs, below are examples of how PMs with a trigger and a contingency should be constructed:

PM 1 – Free product (or specify which COC) in each groundwater monitoring and recovery well is not present within 12 months of CAS operation. If free product is still present at that time, then the Division shall be notified via the CAMR. A meeting may be

requested at which time modifications to the system and/or the CAP will be proposed to address the less than predicted reduction in contaminant concentration.

PM 2 - Benzene concentrations (or specify which COC) in each groundwater monitoring and recovery well will be below the approved SSCLs in 24 months. If the concentrations are not below SSCLs at that time, then the Division shall be notified via the CAMR. A meeting may be requested at which time modifications to the system and/or the CAP will be proposed to address the less than predicted reduction in contaminant concentration.

PM 3 - The system runtime shall be a minimum of 85%. If the percent of time the system has actually operated is less than 85%, then the Division shall be notified via the CAMR. A meeting may be requested to discuss the problems with the system that are adversely affecting runtime.

PM 4 - The efficiency of the air stripper shall meet the discharge limits of the applicable permit. If the discharge permits limits are not met, then the Division shall be notified via the CAMR. A meeting may be requested at which time modifications to the system and/or the CAP may be discussed and possibly proposed to address system efficiency.

CAS Performance Evaluation Meeting

A Performance Evaluation Meeting may be held between the PAR, CAC, and Division personnel as deemed necessary by the Division. Topics for discussion shall include, but not be limited to the following:

- COC concentration reduction (i.e., have applicable SSCLs been achieved);
- Plume dynamics (spreading, shrinking or stability of aqueous, nonaqueous and adsorbed phases);
- System operational performance;
- System operation, maintenance and repair history; and
- Recommendations for system and/or CAP modifications to increase system performance; and
- Any other information as requested by the Division or any other pertinent information necessary to effectively conduct the Performance Evaluation Meeting.

Public participation

For each confirmed release for which a CAP has been required or allowed, notice shall be provided to the public which is designed to reach the members of the public most directly affected by the release and planned corrective action. The contact information obtained from entities within 0.1 mile during the Water Use, Karst, and Receptor Survey can be utilized for notice to these entities. This notice may include, but is not limited to:

- Public notice in local newspapers;
- Block advertisements;
- Public service announcements;
- Publication in a state register;
- Letters to individual households; and/or
- Personal contacts by field staff

VII. Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure

A. Application for Permanent Closure of Underground Storage Tank System

An Application for Permanent Closure of Underground Storage Tank Systems must be submitted at least 30 days before beginning either permanent closure of any portion of an underground storage tank system or a change-in-service unless such action is in response to corrective action. The Application for Permanent Closure of Underground Storage Tank Systems can be submitted to Closure.Application.UST@tn.gov.

- If closing chemical tanks, then contact the Division of Land Protection – Waste Management Branch at (615) 532-0780.
- If closing hazardous substance tanks, then contact the Environmental Protection Agency's UST/PCB/OPA Enforcement and Compliance office at (404) 562-9300.

B. Other Regulatory Requirements

All Federal Regulations, State Rules and local safety ordinances must be adhered to during closure activities. For example, the local fire department or State Fire Marshal's office may have additional requirements as well as OSHA.

C. Implementation of Rule 0400-18-01-.06

If contaminated soils, contaminated groundwater, or free product as a liquid or vapor is discovered during permanent closure of any portion of an UST system, a change-in-service, or by any other manner, owners, operators, and/or other responsible parties shall begin release response and corrective action in accordance with Rule 0400-18-01-.06.

The owner, operator, and/or other responsible party of the petroleum UST system shall, unless directed to do otherwise by the Division, perform the following initial response actions:

- Report the release to the Division within 72 hours.
- Take immediate action to identify fire, explosion, and/or vapor hazards.
- Report any hazard to the Division within 72 hours and manage any hazards identified.
- Take immediate actions to prevent any further release of petroleum into the environment.
- Prevent further migration of the petroleum into surrounding soils and/or groundwater.
 - Removing soil with free product impact or with chemicals-of-concern above screening or cleanup levels is considered a method to prevent further migration.

If closure-in-place is planned and Rule 0400-18-01-.06 is required, the type of closure should be re-evaluated, taking into consideration feasibility and cost of closure as well as assessment and corrective action. Removal of the petroleum and/or the source as an abatement measure shall be evaluated, taking into consideration feasibility and cost, prior to completing closure activities.

Closure-in-place of any tanks that have been structurally compromised cannot be completed unless approved by the Division.

D. UST System (or any portion thereof) - Closure via Removal Assessment

Proper planning shall be conducted prior to mobilization to the site. For example:

- The location of stockpile(s) shall be planned in a manner that allows for overexcavation if required. The stockpile(s) should not limit access to areas of the UST system to be removed. The stockpile can remain in place in the event disposal is necessary and a Special Waste Permit can be obtained.
- The temporary location for the removed USTs, ensuring access is not blocked.
- When applicable, determine site specific groundwater depths by gauging observation wells and monitoring wells.
- Scheduling of removal activities to:
 - Limit the volatilization of chemicals-of-concern from the areas to be sampled,
 - Ensure sampling is conducted in a timeframe that allows prompt delivery to the laboratory for analysis,

- Ensure laboratory analysis of samples is conducted in a timeframe that limits the time that excavations remain open. It is recommended that expedited turn-around-time of laboratory analysis for sampling of excavation pits, trenches, etc. and as needed for stockpiles that may be utilized as backfill.
- Actions that will be taken to limit surface water runoff to impact any excavation if a rain event occurs.
- Actions and/or permits that are necessary to meet all federal, state, and local requirements.

All requirements of Rule 0400-18-01-.07, including Appendix 0400-18-01-.07-A, shall be adhered to for removal of a UST system or any component thereof.

Any concrete/asphalt surface of UST system or any component thereof that is removed shall be stored separately from the backfill and/or overexcavation stockpiles. Disposal of concrete/asphalt is not a reimbursable cost and should not be included with backfill or overexcavated soil.

All excavated and/or stockpiled material must be placed on plastic, properly bermed, and covered with plastic during or in anticipation of a rain event. If practical, obviously contaminated material, as determined by visual observations, olfactory observations or OVD readings should be segregated.

Backfill material shall be removed prior to sample collection. In the event soil or water impacted with free product is observed in the excavation(s), then implementation of Rule 0400-18-01-.06 is necessary, and the free product shall be removed to the extent feasible. In the event potential reimbursement from the UST fund will be sought for the free product abatement, then photographic documentation of the free product impact shall be immediately provided to the Division project manager and included in subsequent reporting to the Division.

Overexcavation Specifications

Obviously contaminated soil shall be removed prior to sample collection. A maximum of 6 linear feet (e.g. 2 or 3 standard bucket widths) for sidewalls and 6 feet deeper than the bottom of the excavation, is allowed for obviously contaminated soil to be removed prior to sample collection. In the event potential reimbursement from the UST fund will be sought for the removal of obvious contamination then documentation shall be immediately provided to the Division project manager and included in subsequent reporting to the Division.

All soil samples required as part of the closure shall be collected shortly after removing USTs from the tankhold, removing product lines and/or backfill material, or removing dispensers and/or under dispenser containment to ensure adequate assessment. If possible, samples should be collected the same day that any UST system component is removed, or the following day if overexcavation of free product or obviously contaminated soil is conducted. This is to ensure limited volatilization occurs. If there is a delay from UST system component removal to sample collection, a detailed explanation and justification must be provided in subsequent reporting.

Tankhold Samples - no water or bedrock encountered

Both current and historic products stored in all USTs within a single tankhold should be utilized to determine the applicable COCs.

The minimum number of samples required are specified in the below table, as well as sample locations. Samples shall be obtained from the tankhold floor at a depth of 1 foot below the bottom of excavation.

If visual observation and/or field screening indicate other zones of suspected contamination, overexcavation in accordance with the Overexcavation Specifications paragraph above shall be conducted. If area(s) of suspected contamination cannot be or are not overexcavated, then additional soil samples shall be collected from each area of suspected contamination.

In the event sample locations are varied, then detailed documentation shall be provided to the Division project manager prior to sample collection and included with subsequent reporting.

Tankhold Samples (no water or bedrock)

Total Tank Storage Capacity (gal) per Tank Hold	Tanks Removed from Ground	
	Minimum # of Samples to be Collected for Analysis	Sample Location Diagram
< 1,120	2	
1,121 – 15,000	4	
15,001 – 30,000	5	

30,001 – 45,000	6	
45,001 – 60,000	7	
> 60,000 (or varied shaped tankhold)	Site Specific	

Tankhold Samples – water or bedrock encountered

Water encountered

A water sample shall be collected when water is present in the tankhold. The water sample must be collected prior to any fluid removal from the tankhold and submitted to a laboratory for analysis for the applicable drinking water COCs. Both current and historic products stored in all USTs within a single tankhold should be utilized to determine the applicable COCs.

Backfill material shall be removed to the maximum extent possible prior to water removal. A maximum of 2,500 gallons of water may be removed and properly disposed without prior approval. Unless the water in the tankhold is obviously recharging, the tankhold shall be left overnight and checked the following morning for recharge. Documentation of recharge, or lack thereof, shall be provided to the Division project manager as well as in subsequent reporting. If any additional water or fluids removal is necessary, such as a free product abatement measure, the documentation including photographs shall be provided to the Division project manager and approval obtained prior to additional removal activities. The documentation shall also be provided in subsequent reporting.

Potential scenarios if water is encountered:

- If water is present in the tankhold following removal of tanks and the water is not due to surface water runoff into the tankhold, then soil samples shall be collected just above the zone of saturation in accordance with the below table.
- If water is removed and does not recharge but is still present (i.e. not all the water was removed), samples shall be collected from the sidewalls and above the current water line in accordance with the below table.
- If water is completely removed and does not recharge, samples shall be collected in accordance with the approved PCA. However, if the soil

is saturated, then samples shall be collected from the tankhold sidewalls in accordance with the below table.

If visual observation and/or field screening indicate other zones of suspected contamination, overexcavation in accordance with the Overexcavation Specifications paragraph above shall be conducted. If area(s) of suspected contamination cannot be or are not overexcavated, then additional soil samples shall be collected from each area of suspected contamination.

In the event sample locations are varied, then detailed documentation shall be provided to the Division project manager prior to sample collection and included with subsequent reporting.

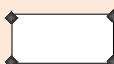
Bedrock Encountered

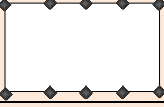
If the tankhold is within bedrock, then a soil sample shall be collected along the sidewalls at the soil/bedrock interface.

If visual observation and/or field screening indicate other zones of suspected contamination, overexcavation in accordance with the Overexcavation Specifications paragraph above shall be conducted. If area(s) of suspected contamination cannot be or are not overexcavated, then additional soil samples shall be collected from each area of suspected contamination.

In the event sample locations are varied, then detailed documentation shall be provided to the Division project manager prior to sample collection and included with subsequent reporting.

Tankhold Samples (water or bedrock present)

Total Tank Storage Capacity (gal) per Tank Hold	Tanks Removed from Ground	
	Minimum # of Samples to be Collected for Analysis	Sample Location Diagram
< 1,120	2	
1,121 – 15,000	4	
15,001 – 30,000	6	

30,001 – 45,000	8	
45,001 – 60,000	10	
> 60,000 (or varied shaped tankhold)	Site Specific	

Product Line Trench Sampling

Soil samples shall be collected from each termination point of a product line, such as a dispenser, and a minimum of one (1) sample per 30 feet span. If product lines are removed during closure, then soil sample(s) must be collected for each product line trench. Areas of obvious contamination must be over-excavated prior to sampling.

For the samples for every 30 feet span:

- Soil samples shall be collected every 30 feet at a depth of one (1) foot below the product line into undisturbed soil or at the soil/bedrock interface, whichever occurs first. Adjustments to the distance between locations shall be made to collect a sample in the area of change in direction of the lines (i.e. union, ell, etc.) If there are no changes in direction of the lines, then the samples shall be equally spaced.

If visual observation and/or field screening indicate other zones of suspected contamination and cannot be or are not overexcavated, then additional soil samples shall be collected from each area of suspected contamination. Based on observation and/or field screening, sample(s) must be collected from the zone of highest suspected contamination.

In the event sample locations are varied, then detailed documentation shall be provided to the Division project manager prior to sample collection and included with subsequent reporting.

Dispenser Removal Only Sampling

Soil samples shall be collected from underneath each dispenser if the dispenser and/or under dispenser containment (UDC) is being removed or replaced.

Areas of obvious contamination must be over-excavated prior to sampling. Soil sample(s) must be collected from a depth of one foot below the bottom of the dispenser into undisturbed soil or at the soil/bedrock interface,

whichever occurs first. If bedrock is encountered during over-excavation, then a soil sample must be collected at the soil/bedrock interface.

If visual observation and/or field screening indicate other zones of suspected contamination and cannot be or are not overexcavated, then additional soil samples shall be collected from each area of suspected contamination. Based on observation and/or field screening, sample(s) must be collected from the zone of highest suspected contamination.

In the event sample locations are varied, then detailed documentation shall be provided to the Division project manager prior to sample collection and included with subsequent reporting.

Monitoring Well Installation

A monitoring well is required to be installed if:

- Measurable free product is present in the water.
- Free product is visually observable in the soil.
- The water analytical result collected from an excavation prior to any water removal exceeds the drinking water ISLs for any COC.
- Soil contamination above the applicable ISL for any COC. This includes any sample from excavation(s), soil stockpile, etc.
- Bedrock is encountered during excavation and/or over-excavation.
- Water, not originating from a rain event and/or surface water runoff, in an excavation that is obviously recharging or recharges overnight following removal activities.
- If excavation is backfilled prior to recharging determination.
- TN EPH in soil exceeds 500 ppm. EPH cannot be over-excavated since it is used as a soil screening mechanism for the potential installation of a monitoring well only.
- Any soil or water sample is not collected and/or analyzed as required.
- A water related hazard is identified such as: petroleum impacted water supply well, groundwater or surface water, etc.

Soil sampling and well installation shall be in accordance with the applicable sections from [VI.B.5](#) through [VI.B.13](#).

E. UST System (or any portion thereof) - Closure-In-Place

This section applies to a UST system or any portion thereof including a tank compartment.

If the tank owner and/or operator is not the property owner, then a notarized approval statement from the property owner shall be included with the

Application for Permanent Closure of Underground Storage Tank Systems. The statement shall include the facility address, tax map, and parcel number.

Due to the nature of a closure-in-place, whereas the UST system (or any portion thereof) cannot be visually inspected, the presence or size of a release cannot be determined, a more comprehensive assessment is required. The number of samples, sample depths, and overall assessment for closure-in-place varies from closure via removal and the appropriate sample protocol must be utilized.

Assessment activities shall be conducted prior to closure-in-place activities. All environmental assessment activities and the evaluation of the subsurface are to be overseen onsite by a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 [Tennessee Code Annotated (T.C.A.) §62-36-101 et seq.] or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.). All well installations are to be conducted by a licensed well driller under the Tennessee Licensed Well Driller Law (T.C.A. §69-10-101 et seq.).

If an entire UST system or all USTs within a common tankhold are closed-in-place then all associated observation wells shall be properly abandoned by a licensed well driller prior to filling the tanks with an inert solid material.

If a release is confirmed requiring implementation of Rule 0400-18-01-.06, then re-evaluation of the type of closure is required, taking into consideration feasibility related to structural integrity concerns as well as cost of closure, assessment and corrective action. Removal of the petroleum and/or the source as an abatement measure shall be evaluated, taking into consideration feasibility and cost, prior to completing closure activities.

The UST system or any portion thereof that is planned for closure-in-place cannot be utilized during or after sample collection (i.e. the UST system or any portion thereof must meet requirements of temporary closure, not in use and empty, prior to sample collection and remain temporarily closed until proper closure is complete).

Soil Assessment

Soil borings shall be installed and sampled in accordance with [section VI.B.4](#) Soil Boring Method and Locations.

- Every 15 feet surrounding the entire UST system and/or the portion thereof to be closed-in-place.

- If lines will be closed-in-place, then a boring shall be advanced at each termination (i.e. at each dispenser and surround the tankhold), and every 15 feet between those points.
- To a depth of 15 feet (regardless of the UST component that is planned to be closed-in-place and/or a change-in-service), at the zone of saturation, or at the soil/bedrock interface, whichever occurs first.
 - If a tankhold is deeper than 15 feet, then soil borings around the tankhold should extend to 1 foot below the tankhold in undisturbed soil.
- If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample, and the OVD readings for the bottommost sample indicates petroleum contaminant levels in excess of contamination identified in shallower intervals for that boring, then the boring depth may be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

Soil samples shall be collected for analysis in accordance with [section VI.B.6](#) Procedures for Screening and Selection of Soil Sample for Laboratory Analysis.

Monitoring Well Installation

A monitoring well is required to be installed if:

- Measurable free product is present in the water.
- Free product is visually observable in the soil.
- The water analytical result collected from an excavation prior to any water removal exceeds the drinking water ISLs for any COC.
- Soil contamination above the applicable ISL for any COC. This includes any sample from excavation(s), soil stockpile, etc.
- Bedrock is encountered during excavation and/or over-excavation.
- Water, not originating from a rain event and/or surface water runoff, in an excavation that is obviously recharging or recharges overnight following removal activities.
- If excavation is backfilled prior to recharging determination.
- TN EPH in soil exceeds 500 ppm. EPH cannot be over-excavated since it is used as a soil screening mechanism for the potential installation of a monitoring well only.
- Any soil or water sample is not collected and/or analyzed as required.
- A water related hazard is identified such as: petroleum impacted water supply well, groundwater or surface water, etc.

Soil sampling and well installation shall be in accordance with the applicable sections from [VI.B.5](#) through [VI.B.13](#).

Completing the UST Closure-in-Place

Justification, such as structural integrity of surface structures, underground structures, etc. shall be submitted for Division approval with the PCA to proceed with closure-in-place. Division approval of the justification must be obtained in writing prior to completing closure-in-place of the UST system or any portion thereof.

Complete this section only if the soil and groundwater has been determined to be below the applicable ISLs or applicable cleanup levels. .

Local ordinances may apply to the closure-in-place of underground storage tank (UST) systems and must be followed.

When properties are sold or transferred, the new owners or new leaseholders should be informed of the presence of UST systems that are closed-in-place.

Closure-in-Place shall include the following unless alternative processes are proposed and approved:

- Prior to excavation, remove all liquid, accumulated sludge(s), or other liquids from the UST system, lines and/or component thereof, including connected components.
- The tank atmosphere shall be purged and regularly tested in accordance with the provisions in 0400-18-01-.07 of the regulations.
- Remove all ancillary equipment (STP, drop tube(s), vapor recovery, plugs etc.) from tank top fittings.
- Excavate down to the UST and/or compartment and install a minimum of one larger access point at the top of the tank to ensure proper cleaning and complete filling. Continued monitoring as required in Rule 0400-18-01-.07 shall be conducted to complete this step.
- Properly clean any remaining product, accumulated sludge(s), or other liquids from the UST system or component thereof, including connected components. UST and/or UST compartment shall be cleaned by utilizing a >100 PSI pressure washer and a vacuum truck to remove the residuals.
- For product piping closure, following cleaning, disconnect each end of piping from the tank, dispenser, and any other component and securely cap all ends.
- Disconnect and cap all piping not used during purging procedures.
 - The vent line must remain open and connected until the tank is filled with an inert solid material.
- Fill the tank with an inert solid material. Note the following materials are allowed:
 - Sand: Dry sand may be added to the tank as long as it flows freely and shall be filled to 80% of its capacity with sand. A sand/water slurry must be used to completely fill the tank.

- Concrete: A free-flowing concrete slurry may be used to completely fill the tank.
- Concrete/Bentonite: A free-flowing concrete/bentonite slurry may be used to completely fill the tank.
- Other inert solid material, including gravel, may be used if approved by Division personnel. Foam or water are not acceptable materials.
- Disconnect and cap the vent line.
- Backfill the excavated area(s) to the surface.

F. UST System (or any portion thereof), Change-In-Service

The UST system or any portion thereof that is planned for a change-in-service cannot be utilized during or after sample collection (i.e. the UST system or any portion thereof must meet requirements of temporary closure, not in use and empty, prior to sample collection and remain temporarily closed until all environmental assessment is complete and report approved by the Division).

Assessment activities shall be conducted prior to change-in-service activities. All environmental assessment activities and the evaluation of the subsurface are to be directed by a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 [Tennessee Code Annotated (T.C.A.) §62-36-101 et seq.] or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.). All well installations are to be conducted by a licensed well driller under the Tennessee Licensed Well Driller Law (T.C.A. §69-10-101 et seq.).

If a release is confirmed requiring implementation of Rule 0400-18-01-.06, then re-evaluation of future use of the UST system or portion thereof shall be made, taking into consideration feasibility related to assessment and corrective action. Removal of the petroleum and/or the source as an abatement measure shall be evaluated, taking into consideration feasibility and cost, prior to a change-in-service.

Soil borings shall be installed and sampled in accordance with [section VI.B.4](#) Soil Boring Method and Locations.

- Every 15 feet surrounding the entire UST system and/or the portion thereof to be closed-in-place.
 - If lines will be closed-in-place, then a boring shall be advanced at each termination (i.e. at each dispenser and surround the tankhold), and every 15 feet between those points.
- To a depth of 15 feet (regardless of the UST component that is planned to be closed-in-place and/or a change-in-service), at the zone of saturation, or at the soil/bedrock interface, whichever occurs first.

- If a tankhold is deeper than 15 feet, then soil borings around the tankhold should extend to 1 foot below the tankhold in undisturbed soil.
- If the zone of saturation and/or the soil/bedrock interface was not encountered in the bottommost sample, and the OVD readings for the bottommost sample indicates petroleum contaminant levels in excess of contamination identified in shallower intervals for that boring, then the boring depth may be extended until OVD readings decrease, or the zone of saturation, and/or soil bedrock interface are encountered.

Soil samples shall be collected for analysis in accordance with [section VI.B.6](#) Procedures for Screening and Selection of Soil Sample for Laboratory Analysis.

Monitoring Well Installation

A monitoring well is required to be installed if:

- Water or free product is encountered in any boring, then a monitoring well shall be installed in the boring location where the highest OVD reading was recorded, free product was identified or water was encountered.
- Bedrock is encountered prior to the target depth or revised total depth based on OVD readings of any/all soil boring(s).
- Soil contamination is above the applicable ISL for any COC.
- TN EPH exceeds 500 ppm.
- Any soil or water sample is not collected and/or analyzed as required.
- A water related hazard is identified such as: petroleum impacted water supply well, groundwater or surface water, etc.

Soil sampling and well installation shall be in accordance with the applicable sections from [VI.B.5](#) through [VI.B.13](#).

In the event groundwater sample(s) from the monitoring well(s) exceed ISLs or cleanup levels then a Water Use Determination shall be conducted in accordance with [section VI.C](#). Initial Response.

G. Reporting

A Permanent Closure Report meeting all requirements provided by the Division report template/form shall be submitted within the timeframe provided in Rule.

Additionally, an Amended Notification Form (CN1260) shall be submitted to Notification.Fees@tn.gov.

H. Other Resources

Tennessee Department of Environment and Conservation, Division of Land Protection – Waste Management Branch:

<https://www.tn.gov/environment/program-areas/solid-waste.html>

National Fire Protection Association (NFPA)

<https://www.nfpa.org/>

American Petroleum Institute (API)

<https://www.api.org/>

VIII. Guidance Related To Rule 0400-18-01-.08 Financial Responsibility

Reserved

IX. Guidance Related to Rule 0400-18-01-.10 Fee Collection

Reserved

X. Guidance Related to Rule 0400-18-01-.11 Appeals

Reserved

XI. Guidance Related to Rule 0400-18-01-.12 Indicia of Ownership

Reserved

XII. Guidance Related to Rule 0400-18-01-.13 Reserved

Reserved

XIII. Guidance Related to Rule 0400-18-01-.14 Record Retention by the Division

Reserved

XIV. Guidance Related to Rule 0400-18-01-.15 Petroleum Product Delivery

Reserved

XV. Guidance Related to Rule 0400-18-01-.16 Certified Operator Program

Reserved

XVI. Guidance Related to Rule 0400-18-01-.17 UST Systems with Field Constructed Tanks and Airport Hydrant Systems

Reserved

XVII. References

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Appendix 1 Report and Application Templates

DRAFT

a. Site Check Report (SCR) Template



**Division of Underground
Storage Tanks**

SITE CHECK REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included (Yes/No)****All Information Listed Below and Completed Signature Page****Attachment 1**

1. Site Map
2. Vicinity Map
3. Analytical Results Map
4. Vapor Monitoring Map
5. Topographic Map (if applicable, for WUS only)
6. One-Tenth (0.1) Mile Parcel Map (if applicable, for WUS only)

Attachment 2

1. Soil Analytical Results Table
2. Groundwater Analytical Results Table
3. Water Supply Well and/or Surface Water Analytical Results Table (if applicable)
4. Water Level Data Table (if applicable)
5. Free Product Removal Table (if applicable)
6. Vapor Monitoring Results Table
7. Water Use Determination Analytical Results Table (if applicable)

Attachment 3

1. Boring Logs (soil and/or monitoring well logs)

Attachment 4

1. Laboratory Analytical Reports (soil and/or water)

Attachment 5

UST_G-01

1. Field Documentation

Attachment 6

1. Health and Safety Plan

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1. Water Use Survey Documentation (if applicable)

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To complete the tables in this report, open the Site Check Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

A. Executive Summary

Provide a summary that, at a minimum, describes the findings of the project to date (for example, soil and groundwater analytical data) discusses all conclusions and interpretations of data derived from the site check activities, and identifies all impacts resulting from the release.

B. Facility and General Information

1. Date of Report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Owner/Operator Name:
6. Owner/Operator Address:

C. Site Description

1. Local and regional topography:
2. Current use of the facility property:
3. Right-of-Way easements:
4. Current zoning and land use of properties within one-tenth (0.1) mile of the facility property:

D. Soil Investigation

1. Describe the methods used to drill and sample all soil borings, including any problems encountered and/or deviations from the current Guidance Manual.
2. Discuss the analytical results of the soil investigation.

E. Groundwater Investigation

1. Describe the rationale in selecting the groundwater monitoring well location.

2. Describe the monitoring well installation procedures and well construction specifications, including any problems encountered and/or deviations from the current Guidance Manual.
3. Describe the procedures used to develop and sample the monitoring well, including any problems encountered and/or deviations from the current Guidance Manual.
4. Discuss the analytical results of the groundwater investigation.

F. Vapor Monitoring Investigation

1. Describe all vapor monitoring procedures, activities, and results.

G. Additional Information and Recommendations

1. Provide a discussion of any additional information and/or recommendations concerning the site check activities and results.

H. Management of Investigative Derived Waste

1. Provide information concerning the amount and management (storage, treatment, and/or disposal of soil removed).
2. Provide information concerning the amount and management (storage, treatment, and/or disposal of water removed).
3. Provide information concerning the amount and management (storage, treatment, and/or disposal) of free product removed.

Signature Page**SITE CHECK REPORT**

A signature page, as shown below, shall be attached to the Site Check Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and a Tennessee licensed P.G. under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or a Tennessee registered P.E. under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (*T.C.A. §62-2-101 et seq.*).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** – Provide a scaled map that depicts the locations of the tank(s) (underground and/or aboveground), product and vent lines, dispensers, buildings, property boundaries, subsurface structures, underground and overhead utilities, soil borings and other soil sampling locations, surface water (if applicable), drinking water wells (if observed), and monitoring wells. Indicate former tank systems with a dashed line. Identify the release point if known. Label the locations of identified hazards if applicable.
2. **Vicinity Map** – Provide a scaled map that depicts the locations of all streets, buildings, subsurface structures, utilities, drinking water wells (if observed), and surface water bodies within one-tenth (0.1) mile from the site. Label the locations of identified hazards, if applicable.
3. **Analytical Results Map** – Provide a scaled plan view map that summarizes the soil and groundwater COC concentrations for each sample location. Include all information provided on the site map.
4. **Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g. basements, utility vaults, sewers, etc.) within 300 feet of known contamination. Indicate the 300-foot line with a dashed line.
5. **Topographic Map (only applicable if a Water Use Survey was conducted)** - Provide a color topographic map depicting the location of all drinking water supplies (wells, springs and/or surface water bodies) within a one-half (0.5) mile radius of the UST site (including the Parcel ID from the water use survey sheets). Provide the site location and the one-quarter (0.25) and one-half (0.5) mile radii from the UST site. If drinking water supplies are identified within one-tenth (0.10) mile radius of the UST site, provide an additional vicinity map showing these locations. Provide a legend detailing the water supply user name, the Parcel ID from the water use survey sheets, etc.
6. **One-Tenth (0.1) Mile Parcel Map (only applicable if a Water Use Survey was conducted)** - Provide a parcel map of all properties within one-tenth (0.1) mile of the UST system that includes each property labeled with parcel numbers.

Attachment 2 – Tables

1. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the applicable Soil Analytical Results Table (titled Soil Analytical Results Table with EPH or Soil Analytical Results Table) located in the Site Check Workbook.
2. **Groundwater Analytical Results Table** – If applicable, provide all groundwater analytical results in the Groundwater Analytical Results Table located in the Site Check

3. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the Site Check Workbook.
4. **Water Level Data Table** – If applicable, provide all water level data in the Water Level Data Table located in the Site Check Workbook.
5. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the Site Check Workbook.
6. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the Site Check Workbook.
7. **Water Use Determination Analytical Results Table (only applicable in specific instances for a Water Use Survey)** – If applicable, provide all analytical results used to determine if the impacted aquifer or water supply met the primary or secondary drinking water standards in the Water Use Determination Table located in the Site Check Workbook.

Attachment 3 – Boring Logs

Provide all detailed boring logs and monitoring well construction logs completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 4 – Laboratory Analytical Reports

All Laboratory Reports to date shall be submitted.

1. **Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
2. **Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
3. **Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 5 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 6 – Health and Safety Plan

Provide a copy of the site-specific Health and Safety Plan, including all completed signature pages.

Attachment 7 – Water Use Survey Documentation (if applicable)

Provide all pertinent documents and information discovered during all stages of the Water Use and Receptor Survey, as well as all below listed documentation.

1. Provide a list of all properties within one-tenth (0.10) mile that coordinates to a labeled parcel map (One-Tenth (0.10) Parcel Map).
2. Provide the Water Well Survey computer printout from the Tennessee Division of Water Resources (DWR) or local government agency for any wells identified within a one-half (0.5) mile radius from the UST site. Highlight all applicable wells on the printout.
3. Provide documentation stating the individual contacted from the Tennessee DWR and/or the authorized local government agency, the date, and the conclusions derived regarding the location of the UST site to any designated Wellhead Protection Area (WPA).
4. Provide the completed Water Use Survey Sheets for all properties within one-tenth (0.10) mile (from [Appendix 1.d](#) in the Guidance Manual).
5. Provide the completed Water Use Survey Sheets for all water supplies (wells, springs, and/or surface water bodies) (from Appendix 1.d in the Guidance Manual) identified within a one-half (0.5) mile radius of the UST site.

b. Hazard Notification Report (HNR) Template



**Division of Underground
Storage Tanks**

HAZARD NOTIFICATION REPORT

In accordance with Rule 0400-18-01-.06(4)(a), this form shall be completed and submitted to the Division of Underground Storage Tanks within 72 hours upon the discovery of impacted drinking water, petroleum vapors, free product, and/or other hazards. This form shall be submitted by electronic mail to the Division and/or the UST Self-Service Application at <https://tdec.tn.gov/ust>.

Date of Notification:

A. Facility Information

1. Facility ID Number:
2. Facility Name:
3. Facility Address:

B. Owner Information

1. Owner ID #:
2. Owner Telephone #:
3. Owner Email Address:
4. Owner Address:

C. Corrective Action Contractor (CAC) Information

1. CAC ID #:
2. CAC Telephone #:
3. CAC Email Address:
4. CAC Address:

D. Hazard Information

Hazard Address:

E. Hazard Type

Provide the type of hazard(s) identified (e.g. impacted drinking water, petroleum vapors, free product, and/or other hazards).

F. Hazard Location

Provide all locations the hazard was identified (e.g. residence, commercial building, sanitary sewer, surface water, storm sewer, observation well, monitoring well, other).

G. Abatement Measure(s) Taken to Date

Describe in detail all abatement measures taken to date.

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Signature Page**HAZARD NOTIFICATION REPORT**

A signature page, as shown below, shall be attached to the Hazard Notification Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

c. Initial Response and Hazard Management Report (IRHMR) Template



**Division of Underground
Storage Tanks**

**INITIAL RESPONSE AND HAZARD
MANAGEMENT REPORT**

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page**

Attachment 1

1. Site Map _____
2. Vicinity Map _____
3. Horizontal Extent of Soil Contamination Map(s) _____
4. Vapor Monitoring Map _____
5. Topographic Map _____
6. One-Tenth (0.1) Mile Parcel Map _____
7. Site Map with Proposed Wells _____

Attachment 2

1. Soil Analytical Results Table _____
2. Groundwater Analytical Results Table _____
3. Water Supply Well and/or Surface Water Analytical Results Table (if applicable) _____
4. Water Level Data Table _____
5. Free Product Removal Table (if applicable) _____
6. Vapor Monitoring Results Table _____

Attachment 3

1. Boring Logs _____

Attachment 4

1. Laboratory Analytical Reports (soil and/or water) _____

Attachment 5

1. Water Use Survey Documentation _____

Attachment 6

1. Hazard Management Section Completion (if applicable) _____

Attachment 7

1. Field Documentation _____

Attachment 8

1. Health and Safety Plan (if not previously submitted) _____

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Attachment 6 – Hazard Management (if applicable)	
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Attachment 8 – Health and Safety Plan (if not previously submitted).....	

To complete the tables in this report, open the IRHMR Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

A. Facility and General Information

1. Date of Report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Owner/Operator Name:
6. Owner/Operator Address:

B. Release History

1. Date release confirmed:
2. Date release reported to the Division:
 - a) Name of Division personnel contacted:
 - b) Reported by:
 - c) Method of contact:
3. Type of petroleum released (e.g. gasoline, diesel, kerosene, etc.):
4. Source of release (e.g. UST, line, dispenser, etc.):
5. Provide specific details about the release point, if known (Tank #2, line leak detector failure, regular unleaded flex connector failure at dispenser #3, etc.).
6. Provide the volume of release in gallons. Provide if the volume is known, estimated, or unknown.
7. Describe actions taken to prevent further release to the environment (e.g., removal of product from tank, repair to or removal of the tank system, etc.) and to prevent further migration of petroleum (e.g., removal of free product, removal of contaminated soil, etc.).

C. Receptor Information

1. Provide a summary of water use at or in the vicinity of the UST facility that includes, but is not limited to, the following:
 - a) Water supply on the UST property (e.g. municipal, private well, private spring);
 - b) Water supply on adjacent properties within one-tenth (0.10) mile of the UST property (e.g. municipal, private well, private spring);
 - c) List of all wells identified within one-half (0.5) mile radius of the UST property;
 - d) Address, distance, and direction to the nearest drinking water well within one-half (0.5) mile radius of the UST site, if applicable;
 - e) Wellhead Protection Area (WPA)
 - i. Distance and direction to the nearest WPA within one-half (0.5) mile radius of the UST site, if applicable;
 - ii. Provide information for the agency and name and phone number of the person contacted to determine location of nearest WPA; and
 - iii. Name, distance, and direction to the nearest surface water within one-half (0.5) mile radius of the UST site, if applicable.
2. Provide a summary of land use at or in the vicinity of the UST facility that includes, but is not limited to, the following:
 - a) Land use on UST property (e.g. commercial or residential);
 - b) Type of structural foundation(s) on the UST property (e.g. basement, crawlspace, slab-on-grade);
 - c) Locations of rights-of-way, easements, and building setbacks. Provide information for the agencies and names and phone numbers of persons contacted and distances provided;
 - d) Current land use on adjacent properties (e.g. commercial, residential, agricultural);
 - e) Type of structural foundation(s) on the adjacent properties (e.g. basement, crawlspace, slab-on-grade); and

- f) Address, distance and direction to the nearest off property occupied residence within one-half (0.5) mile radius of the UST site, if applicable. Include type of foundation for the building (e.g. basement, crawlspace, slab-on-grade).

D. Hazard Information

1. Provide a summary of any identified hazards at or in the vicinity of the UST facility that includes, but is not limited to, the following:
 - a) Any petroleum hazard(s) discovered (e.g. impacted drinking water, petroleum vapors, free product, etc.) and its impacts;
 - b) Date of discovery for any hazard(s) identified;
 - c) Location of hazard(s) discovered (e.g. residence, commercial building, sanitary sewer, storm sewer, surface water, wells, etc.); and
 - d) Address(es) and phone number(s) of locations where hazard(s) was/were discovered.

E. Hazard Management

Provide a summary of all abatement actions completed to mitigate the identified hazard(s). Attachment 6 of this report shall be completed detailing all hazard management activities.

F. Site Investigation

1. Describe observations from the visual inspection of the petroleum release(s).
2. Soil Investigation Results

Provide a summary of all soil investigation procedures, activities, and results including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc.

3. Water Investigation Results

If groundwater, drinking water, and/or surface water (including water supply samples) were collected and analyzed, provide a summary of the sampling procedures, activities, and results.

4. Free Product Measurements

Provide a summary of all free product measurement procedures, activities, and results. Include initial and most recent findings before and after abatement activities. Document all changes and trends based on the results.

5. Vapor Monitoring Results

Provide a summary of all vapor monitoring procedures, activities, and results. Include initial and most recent findings before and after abatement activities. Document all changes and trends based on the results.

G. Site Results Summary and Well Recommendations

Provide a summary of all site results from the soil and/or water investigation. Based on the results, provide a site map with proposed locations of a minimum of three (3) additional wells required to be installed as part of the release investigation.

H. Management of Investigative Derived Waste

1. Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil removed.
2. Provide information concerning the amount and management (storage, treatment, and/or disposal) of water removed.
3. Provide information concerning the amount and management (storage, treatment, and/or disposal) of free product removed.

Signature Page**INITIAL RESPONSE AND HAZARD MANAGEMENT REPORT**

A signature page, as shown below, shall be attached to the Initial Response and Hazard Management Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

- 1. Site Map** - Provide a vicinity map of the area depicting the locations of all streets, buildings, drinking water wells (if observed), and surface water bodies within one-tenth (0.1) mile from the site. Label the locations of identified hazards, if applicable.
- 2. Vicinity Map** - Provide a scaled site map depicting the location of the tank(s), product and vent line(s), dispenser(s), buildings, property boundaries, rights-of-way, easements, building setbacks, subsurface structures, underground and overhead utilities (main and service lines), soil borings and other soil sampling locations, surface water (if applicable), drinking water wells (if applicable), vapor monitoring points (if applicable), and monitoring wells (if applicable). Indicate former tank systems with a dashed line. Identify the release point, if known. Label the locations of identified hazards, if applicable.
- 3. Horizontal Extent of Soil Contamination Map(s)** - Provide a separate, contoured, scaled plan view map showing the horizontal extent for each COC that exceeds the applicable RBCL based on the most current soil sampling event. Contour each map to the appropriate RBCL of the COC. Indicate the COC soil source width parallel to groundwater flow direction (if known) with an arrow that depicts that width in feet. The map(s) shall also contain all site map requirements. Identify the release point, if known.
- 4. Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g. basements, utility vaults, sewers, etc.) within 300 feet of known contamination above the applicable RBCL. Indicate the 300-foot line with a dashed line.
- 5. Topographic Map** - Provide a color topographic map depicting the location of all drinking water supplies (wells, springs and/or surface water bodies) within a one-half (0.5) mile radius of the UST site (including the Parcel ID from the water use survey sheets). Provide the site location and the one-quarter (0.25) and one-half (0.5) mile radii from the UST site. If drinking water supplies are identified within one-tenth (0.10) mile radius of the UST site, provide an additional vicinity map showing these locations. Provide a legend detailing the water supply user name, the Parcel ID from the water use survey sheets, etc.
- 6. One-Tenth (0.1) Mile Parcel Map** - Provide a parcel map of all properties within one-tenth (0.10) mile of the UST system that includes each property labeled with parcel numbers.

7. **Site Map with Proposed Wells** - Provide a site map with the proposed location of a minimum of three (3) additional wells as required for release investigation.

Attachment 2 – Tables

1. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the IRHMR Workbook.
2. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the IRHMR Workbook.
3. **Water Supply Well/Surface Water Analytical Results Table (if applicable)** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the IRHMR Workbook.
4. **Water Level Data Table** – If applicable, provide all water level data in the Water Level Data Table located in the IRHMR Workbook.
5. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the IRHMR Workbook.
6. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the IRHMR Workbook.

Attachment 3 - Boring Logs

Provide all detailed boring logs and monitoring well construction logs completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 4 - Laboratory Analytical Reports

All Laboratory Reports to date shall be submitted (segregated by sampling event and in chronological order).

1. **Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.

2. **Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
3. **Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 5 – Water Use Survey Documentation

Provide all pertinent documents and information discovered during all stages of the Water Use and Receptor Survey, as well as all below listed documentation.

1. Provide a list of all properties within one-tenth (0.10) mile that coordinates to a labeled parcel map (Figure 5 – One-Tenth (0.10) Parcel Map).
2. Provide the Water Well Survey computer printout from the Tennessee Division of Water Resources (DWR) or local government agency for any wells identified within a one-half (0.5) mile radius from the UST site. Highlight all applicable wells on the printout.
3. Provide documentation stating the individual contacted from the Tennessee DWR and/or the authorized local government agency, the date, and the conclusions derived regarding the location of the UST site to any designated Wellhead Protection Area (WPA).
4. Provide the completed Water Use Survey Sheets for all properties within one-tenth (0.10) mile (from [Appendix 1.d](#) in the Guidance Manual).
5. Provide the completed Water Use Survey Sheets (from [Appendix 1.d](#) in the Guidance Manual) for all water supplies (wells, springs, and/or surface water bodies) identified within a one-half (0.5) mile radius of the UST site.

Attachment 6 – Hazard Management (if applicable)

Provide a summary of the following applicable sections (Section 1,2,3 and/or 4). The summary shall include but not be limited to the following for each section:

1. Petroleum Impacted Drinking Water

- a) Date impact reported to the Division:

- b) Method of contact:
- c) Division personnel contacted:
- d) Impact reported by:
- e) Date water supply was sampled and/or resampled:
- f) Date the water supply laboratory results were received by the owner/operator or their CAC:
- g) Date water user(s) was/were informed:
- h) Summary of the laboratory analytical results:
- i) When applicable, (e.g. PAHs, Metals), confirm if the water supply sample was field filtered in accordance with the analytical method:
- j) Explain if a temporary or permanent water supply has been provided, and if so, what type (e.g. bottled water, temporary filtration system, connection to public water, installation of a new water well, permanent filtration system, etc.):

2. Petroleum Vapor Impact

- a) Date impact reported to the Division:
- b) Method of contact:
- c) Division personnel contacted:
- d) Impact reported by:
- e) Describe the temporary action taken to mitigate hazards posed by vapors:
- f) Provide all concentrations of vapors detected:
- g) Provide a 500-foot radius site map depicting the location of each reading:
- h) Describe in detail all vapor abatement measures:

3. Free Product

- a) Date impact reported to the Division:
- b) Method of contact:
- c) Division personnel contacted:
- d) Impact reported by:
- e) Provide the location(s) of identified free product:
- f) Date interim free product removal activity was initiated:
- g) Describe the type of interim free product removal activity that was initiated:
- h) Date interim removal activity was terminated, if applicable:
- i) Describe the method and location of disposal for the recovered free product, liquids, soils, pads, booms, etc. Attach disposal manifests.
- j) If applicable, describe the location(s) and/or thickness(es) of any free product that is still present twenty-four (24) hours after the termination of the interim free product removal activities:
- k) Provide the total volume of free product (in gallons) removed during the interim removal period:
- l) Provide the total volume of water removed (in gallons) during the interim removal activities:

4. Petroleum Impacted Surface Water

- a) Date impact reported to the Division:
- b) Method of contact:
- c) Division personnel contacted:
- d) Impact reported by:
- e) Provide the location(s) of the identified free product:
- f) Date interim free product removal activity was initiated:

- g) Describe the type of interim free product removal activity that was initiated (e.g. installed booms, pads, dams, trench, etc.):
- h) Describe the schedule of boom maintenance (e.g. frequency of boom monitoring, replacement, etc.):
- i) Describe the method and location of disposal for the recovered free product, liquids, soils, pads, booms, etc. (attach disposal manifests):
- j) Date interim removal activity was terminated, if applicable:
- k) Describe the condition of the surface water twenty-four (24) hours after interim free product removal was completed:

Attachment 7 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 8 – Health and Safety Plan (if not previously submitted)

If not previously submitted, provide a copy of the site-specific Health and Safety Plan, including all completed signature pages.

d. Water Use & Receptor Survey Sheet Templates

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Private Supply – Water Use and Receptor Survey Sheet

Facility ID: _____ Facility Name: _____

Interviewer Information**User Information**

Interviewer: _____ Person providing information: _____

Company: _____ Address: _____

Method of Contact: _____ Parcel Number: _____

Date, Time of Contact: _____ Contact Information: _____

Water Use Information (Y/N)**Use (Mark all that apply)**

City Water Supply: _____ Drinking/Cooking: _____ Washing: _____ Bathing: _____

OR

Private Water Supply: _____ Irrigation: _____ Livestock: _____ Commercial: _____ Other: _____

Well Information:

TN Well Registration Number: _____ Signs of petroleum contamination?: _____

Driller: _____ Well depth (ft): _____ Well diameter (ft): _____ Well logs?: _____

Pump type: _____ Casing Size: _____ Casing Depth: _____ Screen Location: _____

Recent repairs?: _____ Has the quality changed?: _____

Karst Survey (e.g. springs, sinkholes, sinking streams)

Any karst features on the property? If so, explain: _____

Evidence of petroleum contamination in karst feature(s): _____

Receptor Survey (e.g. commercial, residential, basement, crawlspace, slab-on-grade)

Property Use and Foundation Type: _____

If personal interview fails, answer the following questions and provide a photo:

Well identified on the property?: _____ Water meter identified on the property?: _____

If a meter was identified, did utility department confirm it is in use?: _____

Additional Remarks:

Public Supply – Water Use and Receptor Survey Sheet

Facility ID: _____ Facility Name: _____

Interviewer Information**User Information**

Interviewer: _____ Person providing information: _____

Company: _____ Address: _____

Method of Contact: _____ Parcel Number: _____

Date, Time of Contact: _____ Contact Information: _____

Water Source

Well: _____ Distance and direction of water source from UST system: _____

Spring: _____ Has the quality changed? If yes, explain: _____

Water Body: _____ Recent repairs? If yes, explain: _____

System Information:

Utility District Name: _____ Driller: _____

TN public water identification number: _____ Well depth (ft): _____

Well diameter (ft): _____ Well logs?: _____ Pump type: _____ Casing Size: _____

Casing Depth: _____ Screen Location: _____ VOA sample results available?: _____

Karst Survey (e.g. springs, sinkholes, sinking streams)

Any karst features on the property? If so, explain: _____

Evidence of petroleum contamination in karst feature(s)?: _____

Receptor Survey (e.g. commercial, residential, basement, crawlspace, slab-on-grade)

Property Use and Foundation Type: _____

Additional Remarks:

e. Initial Site Characterization Report (ISCR) Template



**Division of Underground
Storage Tanks**

INITIAL SITE CHARACTERIZATION REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page**

Attachment 1

1.	Site Map	_____
2.	Vicinity Map	_____
3.	Surveyor Map	_____
4.	Vapor Monitoring Map	_____
5.	Topographic Map	_____
6.	Receptor Map	_____
7.	Bedrock Contour Map (if applicable)	_____
8.	Horizontal Extent of Soil Contamination Map(s)	_____
9.	Horizontal Extent of Groundwater Contamination Map(s)	_____
10.	Potentiometric Maps	_____

Attachment 2

1.	Soil Analytical Results Table	_____
2.	Groundwater Analytical Results Table	_____
3.	Water Supply Well and/or Surface Water Analytical Results Table (if applicable)	_____
4.	Free Product Removal Table (if applicable)	_____
5.	Water Use Determination Analytical Results Table (if applicable)	_____
6.	Potentiometric Table	_____

7. Vapor Monitoring Results Table

Attachment 3

1. Boring Logs (soil and/or monitoring well construction logs)

Attachment 4

1. Laboratory Analytical Reports (soil and/or water)

Attachment 5

1. Hydraulic Gradient Calculations

Attachment 6

1. Request for Approval of SSCLS and RAR

Attachment 7

1. Field Documentation

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Attachment 4 - Laboratory Analytical Reports.....	
1. Soil Laboratory Analytical Report(s)	

2. Groundwater Laboratory Analytical Report(s)
3. Water Supply Well and/or Surface Water Laboratory Analytical Report(s)
(if applicable).....

Attachment 5 – Hydraulic Gradient Calculations.....

Attachment 6 – Request for Approval of SSCLs and Risk Analysis Report

Attachment 7 – Field Documentation

To complete this report, open the ISCR Workbook-Final.xlsx, Risk Analysis Report.xls, and Reference Tables.xls Excel files in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate file.

A. Executive Summary

Provide a summary that, at a minimum, describes the findings of the project to date, discusses all conclusions and interpretations of data derived from implementing the environmental assessment activities, and identifies all impacts resulting from the release.

B. Introduction

Provide a brief site history that, at a minimum, includes the following:

1. A summary of all initial abatement activities performed;
2. A summary of actions taken to identify and eliminate the sources of contamination;
3. A summary of past releases that have occurred; and
4. A discussion of potential source areas (e.g., tanks, lines, dispensers, etc.).

C. Site Description

Provide a brief description of the site, including but not limited to:

1. Current zoning and land use (and any proposed changes);
2. Right-of-way easements and building setback distances;
3. Site ownership at the time of the release;
4. Local topography and any effects it may have on contaminant migration at the site; and
5. Preferential vapor pathways.

D. Soil Investigation

Provide a summary of all soil investigation activities to date. This summary should include, but not be limited to, the results of the release investigation, closure activities, site check investigation, any soil source removals, etc. Provide a discussion of potential source areas (e.g., tanks lines dispensers, etc.) and/or past releases.

1. Geology

Provide the following information:

- a) A description of the regional geologic section;
- b) A description of the geologic section at the site;
- c) A description of the soil and/or bedrock lithologies encountered at the site and its relation to the contaminant plume distribution; and
- d) If bedrock is encountered, include a discussion of the strike and dip of the bedrock at the site and its effects on plume migration. Reference the plan view map of the bedrock contour (Attachment 1).

2. Soil Results

- a) Provide a discussion of the predominant lithology in both the vadose and capillary fringe zones at the site. These lithology types will be utilized as input parameters in the Division's RAR.
- b) Describe the methods and procedures used to drill and sample all soil borings.
- c) Provide a summary of all soil boring results to date including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc. Document all changes and trends based on the results.

E. Water Investigation

Provide a summary of all activities concerning the surface and groundwater investigation to date. This should include, but not be limited to the results of the release investigation, closure activities, site check investigation, any interim corrective action, etc.

1. Location and Current Use of Groundwater

- a) State the current groundwater usage of the impacted groundwater (e.g. drinking water supply or non-drinking water supply) at the time of the ISCR preparation.
- b) Discuss the reasonably expected future use of groundwater at this site. If the impacted groundwater at the site is not currently used as drinking water, then it **is not reasonable** to expect that the groundwater at the site will be used as drinking water in the future.

2. Location and Current Use of Surface Waters

- a) Discuss any current use(s) of the surface waters within a one-half (0.5) mile radius of the site (e.g., drinking water supply, recreational, etc.).
- b) Discuss the reasonable expected future use(s) of surface waters near the site. If the impacted surface waters at the site are not currently used as drinking water, then it **is not reasonable** to expect that the surface waters at the site will be used as drinking water in the future.

3. Hydrogeology

- a) Describe the occurrence and movement of groundwater at the site and its relationship to both soil and groundwater contamination. Include conclusions concerning the relationship of this site to any areas of contamination extending beyond the UST property, if applicable. Discuss the presence of any hydrogeologic barriers that may affect contaminant migration. Include potential or known impact to designated wellhead protection areas and/or nearby drinking water supplies.
- b) If the site is located in an area with carbonate bedrock, or if caves, springs, sinking streams or other karst features exist within a one-half (0.5) mile radius of the site, then provide conclusions concerning how this may affect groundwater movement at the site. Include in this discussion any evidence of petroleum migrating through karst systems, estimated travel times, evidence of impacted water supply wells, contaminated springs, or evidence of petroleum migrating into nearby streams.
- c) Describe the occurrence and movement of surface water near the site and its relationship to both soil and groundwater contamination. Include conclusions concerning the relationship of this site to any areas of off-site contamination, if applicable.
- d) Describe the occurrence and movement of free product at the site.
- e) Provide the highest calculated hydraulic gradient from the most recent gauging event. Calculations shall be included in Attachment 5.

4. Monitoring Well Construction, Development, and Sampling

- a) Describe the monitoring well installation procedures.
- b) Describe the procedures used to develop all monitoring wells..

- c) Describe the procedures used to sample all monitoring wells including purging, sampling, and chain of custody protocols.

5. Water Analytical Results

Provide a summary of all water analytical results to date including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc. Document all changes and trends based on the results.

6. Water Use Determination Procedures

Provide a summary of all water use and karst survey results as previously documented. If applicable, discuss the results of the primary and secondary water analytical results or any additionally required steps to determine water use for the facility.

F. Vapor Monitoring

Provide a summary of all vapor monitoring results to date. Document all changes and trends based on the results. If permanent vapor abatement solutions were implemented, provide a summary of the abatement activities.

G. Applicable Cleanup Levels

Calculate SSCLs utilizing the Division's Risk Analysis Report (RAR) spreadsheet. Instructions for completing the spreadsheet are found in [section VI.F.a](#). Instruction for the Risk Analysis Report (spreadsheet completion) of the Guidance Manual. Include and discuss the results from the Summary Page of the RAR. Provide a table summarizing the requested SSCLs. Provide an explanation as to how the groundwater source width perpendicular to groundwater flow (in centimeters) and the soil source width parallel to groundwater flow direction (in centimeters) input parameter was determined.

A Site-Specific Standard Request shall be submitted in Attachment 6 in the format of a letter addressed to the Division Director. The letter shall contain the facility name, facility identification number, the tank owner of record at the time of the release, the date of the report, a summary statement containing the proposed cleanup levels, and all the pages from the completed RAR.

H. Proposed Additional Monitoring Wells

If the water usage in the area is determined to be drinking water and proposed SSCLs indicate the site is not eligible for closure, then additional site characterization can be proposed. The

proposal is to include a scaled site map depicting the location of the proposed monitoring wells and a justification for the placement of each additional well including the following:

I. Management of Investigative Derived Waste

1. Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil removed.
2. Provide information concerning the amount and management (storage, treatment, and/or disposal) of water removed.
3. Provide information concerning the amount and management (storage, treatment, and/or disposal) of free product removed.

J. Recommendations

Provide recommendations for the next course of action.

Signature Page**INITIAL SITE CHARACTERIZATION REPORT**

A signature page, as shown below, shall be attached to the Initial Site Characterization Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
2. **Vicinity Map** - Provide a vicinity map of the area depicting the site location, all streets, buildings, subsurface structures, utilities, and surface water bodies within one-tenth (0.10) mile of the site. If drinking water supplies are adjacent to the UST site, then include those locations. Include a legend on the map detailing the identification number, user's name and the parcel number.
3. **Surveyor Map** - Provide the Tennessee Licensed Surveyor's Map generated from the Professional Survey. This map shall depict the distances and angles (relative to magnetic north) from the source well to the established and documented point on the top of each well casing.
4. **Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g. basements, utility vaults, sewers, etc.) within 300 feet of known contamination above the applicable SSCL. Indicate the 300 foot line with a dashed line.
5. **Topographic Map** - Provide a color topographic map with the site location indicated and the locations of all drinking water supplies (wells, springs, and/or surface water bodies) within a one-half (0.5) mile radius of the UST site. Identify each drinking water supply with the well identification number. Include a legend on the map detailing the identification number, user's name and the parcel number. Depict the one-tenth (0.1) and one-half (0.5) mile radii from the UST site on the topographic map.
6. **Receptor Map** - Provide a scaled receptor map of the area depicting the nearest current residential and commercial off-site receptors for each applicable pathway. Draw an arrow to each receptor from the monitoring well with the highest benzene concentration and depict the distance to each receptor in feet. Identify the nearest drinking water receptors by user name and identification number from the water use survey sheets included in [Appendix 1.d](#). If benzene concentrations are below laboratory analytical detection limits, then draw the arrow from the monitoring well with the highest COC concentration based on the following order: toluene, ethylbenzene, total xylenes, Methyl Tertiary Butyl Ether (MtBE), naphthalene, Polycyclic Aromatic Hydrocarbons (PAHs).

7. **Bedrock Contour Map** – If applicable, provide a plan view map showing the bedrock contour based on depths at which bedrock was encountered during the advancement of soil borings and monitoring wells. The map shall contain all site map requirements.
8. **Horizontal Extent of Soil Contamination Map(s)**- Provide a separate, contoured, scaled plan view map showing the horizontal extent for each COC that exceeds the proposed applicable SSCL based on the most current soil sampling event. Contour each map to the proposed appropriate SSCL of the COC. Indicate the COC soil source width parallel to groundwater flow direction with an arrow that depicts that width in feet. The map(s) shall also contain all site map requirements.
9. **Horizontal Extent of Groundwater Contamination Map(s)** – Provide a separate, plan view scaled site map showing the horizontal extent and most recent concentration for each COC that exceeds the proposed applicable SSCL **in more than one well**. Contour each map to the proposed appropriate SSCL of the COC. The horizontal extent and thickness (in feet) of any free product shall be depicted on each map. Indicate the COC groundwater source width perpendicular to groundwater flow direction with an arrow that depicts this distance in feet. The map(s) shall also contain all site map requirements. If multiple aquifers have been impacted, then provide a separate plan view map for each aquifer.
10. **Potentiometric Maps** - Provide two (2) scaled potentiometric maps derived from data collected at least thirty (30) days apart. If multiple aquifers were investigated due to the presence of contamination in a deeper aquifer and sufficient data is generated, then include potentiometric maps for each aquifer. Depict the interpreted direction of groundwater flow with an arrow(s).

Attachment 2 – Tables

1. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the ISCR Workbook.
2. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the ISCR Workbook.
3. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the ISCR Workbook.
4. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the ISCR Workbook.

5. **Water Use Determination Analytical Results Table** – If applicable, provide all analytical results used to determine if the impacted aquifer or water supply met the primary or secondary drinking water standards in the Water Use Determination Table located in the ISCR Workbook.
6. **Potentiometric Table** – If applicable, provide all water level data in the Potentiometric Table located in the ISCR Workbook.
7. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the ISCR Workbook.

Attachment 3 - Boring Logs

Provide all detailed boring logs and monitoring well construction logs completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 4 - Laboratory Analytical Reports

All Laboratory Reports to date shall be submitted (segregated by sampling event and in chronological order).

1. **Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
2. **Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
3. **Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 5 – Hydraulic Gradient Calculations

Provide all calculations completed to determine the highest calculated hydraulic gradient from the most recent gauging event.

Attachment 6 – Request for Approval of SSCLs and Risk Analysis Report

Provide a Site-Specific Standard Request in the format of a letter addressed to the Division Director. The letter shall contain the facility name, facility identification number, the tank owner of record at the time of the release, the date of the report, a summary statement containing the proposed cleanup levels (SSCLs), and all the pages from the completed RAR. Provide the completed Proposed Site-Specific Cleanup Levels Table located in the ISCR Workbook. Provide all the pages from the completed RAR.

Attachment 7 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

f. Risk Monitoring Report (RMR) Template



**Division of Underground
Storage Tanks**

RISK MONITORING REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page**

Attachment 1

1. Site Map _____
2. Soil Analytical Results Map _____
3. Groundwater Analytical Results Maps _____
4. Horizontal Extent of Soil Contamination Map(s) _____
5. Horizontal Extent of Groundwater Contamination Map(s) _____
6. Potentiometric Maps _____
7. Vapor Monitoring Map _____
8. Receptor Map _____

Attachment 2

1. Applicable Cleanup Levels for COCs Table _____
2. Soil Analytical Results Table _____
3. Groundwater Analytical Results Table _____
4. Water Supply Well and/or Surface Water Analytical Results Table (if applicable) _____
5. Potentiometric Table _____
6. Free Product Removal Table (if applicable) _____
7. Vapor Monitoring Results Table _____

Attachment 3

1. Laboratory Analytical Reports (soil and/or water) _____

Attachment 4

1. Field Documentation

Attachment 5

1. Water Use Survey Sheets (if applicable)

Attachment 6

1. Updated Vapor Hazard Documentation (if applicable)

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I. Management of Investigative Derived Waste	
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3. Groundwater Analytical Results Map	
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5. Horizontal Extent of Groundwater Contamination Map(s)	
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3. Water Supply Well and/or Surface Water Laboratory Analytical Report(s)	
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Attachment 5 - Water Use Survey Sheets (if applicable)	
Attachment 6 - Updated Vapor Hazard Documentation (if applicable)	

To complete the tables in this report, open the Monitoring Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click the paperclip located on the sidebar panel and select the appropriate workbook.

A. Executive Summary

Provide a summary that, at a minimum, describes the findings of the project to date, discusses new impacts, changes at the site, and contaminant concentration trends for soil and/or water.

B. Applicable SSCLs

Provide a summary of the maximum groundwater concentrations for each COC during this sampling event, the maximum soil concentrations for each COC from the most recent sampling event, and the approved SSCLs.

C. Soil Results

Provide a summary of all soil boring results to date including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc. Document all changes and trends based on the results. If applicable, provide a detailed summary discussing any new soil investigation activities that occurred during this monitoring period.

D. Water Results

Provide a detailed discussion of water sampling activities (e.g., drinking water and/or surface water impact, the occurrence of free product, etc.) that have occurred at this site to date. Provide a detailed summary discussing any new groundwater investigation activities that occurred during this monitoring period.

E. Free Product Data

Provide a detailed discussion of all free product occurrences and recovery activities. At a minimum, provide where free product was detected during this monitoring event and where it has been detected historically. Document all changes and trends based on the results. Provide a detailed summary discussing any new free product investigation activities that occurred during this monitoring period.

F. Potentiometric Data

Provide a detailed discussion of the groundwater measurements from the current monitoring period. Provide a comparison of current measurements to historical measurements. Provide a summary of all gauging events to date, including changes and trends (i.e. depth to water is shallower or deeper than historically, rain events occurrences, seasonal fluctuations, etc.)

G. Vapor Monitoring Results

Provide a summary and description of all vapor monitoring of above ground and/or subsurface structures (e.g., basements, utility vaults, sewers, etc.) within 300 feet of the site and all other locations previously impacted by petroleum vapors. If new vapor impacts were identified, provide documentation that it was handled in accordance with [section VI.D.2](#) Vapor Hazards of the Guidance Manual. Any new petroleum vapor impacts shall be discussed. Document all changes and trends based on the results.

H. Receptor Monitoring Results

A receptor survey shall be completed once per calendar year. Provide a discussion of the most recent receptor survey conducted. If a change in a receptor is identified, or a new receptor is identified, complete the applicable Water Use and Receptor Survey Sheet located in [Appendix 1.d](#).

I. Management of Investigative Derived Waste

1. Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil removed.
2. Provide information concerning the amount and management (storage, treatment, and/or disposal) of water removed.
3. Provide information concerning the amount and management (storage, treatment, and/or disposal) of free product removed.

J. Additional Information and Recommendations

Provide a discussion of any additional information, assessments, and/or recommendations concerning the site monitoring activities and/or site data (e.g. a monitoring well has been paved over or has sustained damage, additional site characterization is recommended, etc.).

Signature Page**RISK MONITORING REPORT**

A signature page, as shown below, shall be attached to the Risk Monitoring Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
2. **Soil Analytical Results Map** – Provide a scaled plan view map that summarizes the applicable COC concentrations from the most recent soil sampling event. Include all information provided on the site map.
3. **Groundwater Analytical Results Map** – Provide a scaled plan view map that summarizes the applicable COC concentrations from the most recent groundwater sampling event. Include all information provided on the site map.
4. **Horizontal Extent of Soil Contamination Map(s)** – Provide a separate, contoured, scaled plan view map showing the horizontal extent for each COC that exceeds the applicable SSCL based on the most current soil sampling event. Contour each map to the appropriate SSCL of the COC. Indicate the COC soil source width parallel to groundwater flow direction with an arrow that depicts that width in feet. The map(s) shall also contain all site map requirements.
5. **Horizontal Extent of Groundwater Contamination Map(s)**– Provide a separate, plan view scaled site map showing the horizontal extent and most recent concentration for each COC that exceeds the applicable SSCL **in more than one well**. Contour each map to the appropriate SSCL of the COC. The horizontal extent and thickness (in feet) of any free product shall be depicted on each map. Indicate the COC groundwater source width perpendicular to groundwater flow direction with an arrow that depicts this distance in feet. The map(s) shall also contain all site map requirements. If multiple aquifers have been impacted, then provide a separate plan view map for each aquifer.
6. **Potentiometric Maps** - Provide two (2) scaled site maps that include potentiometric data collected during the current and previous monitoring events. If multiple aquifers were investigated and sufficient data is generated, include potentiometric maps for each aquifer. Contour the potentiometric data on each map and include arrows depicting the interpreted direction(s) of groundwater flow. Record all measurements to 0.01 feet including the depth of the well. If free product is present, depict the horizontal extent on the potentiometric map(s).
7. **Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g.

basements, utility vaults, sewers, etc.) within 300 feet of known contamination above the applicable SSCL. Indicate the 300-foot line with a dashed line.

8. **Receptor Map** - Provide a scaled receptor map of the area depicting the nearest current residential and commercial off-site receptors for each applicable pathway. Draw an arrow to each receptor from the monitoring well with the highest benzene concentration and depict the distance to each receptor in feet. Identify the nearest drinking water receptors by username and identification number from the water use survey sheets included in [Appendix 1.d](#). If benzene concentrations are below laboratory analytical detection limits, then draw the arrow from the monitoring well with the highest COC concentration based on the following order: toluene, ethylbenzene, total xylenes, Methyl Tertiary Butyl Ether (MtBE), naphthalene, Polycyclic Aromatic Hydrocarbons (PAHs).

Attachment 2 – Tables

1. **Applicable Cleanup Levels for COCs Table** – Provide the applicable cleanup levels and maximum concentrations from the most current sampling event for soil and groundwater in the Applicable Cleanup Levels for Chemicals of Concern (COC) Table located in the Monitoring Workbook. Identify which COCs have exceeded the cleanup levels by shading the appropriate box.
2. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the Monitoring Workbook.
3. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the Monitoring Workbook.
4. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the Monitoring Workbook.
5. **Potentiometric Table** – Provide all water level data in the Potentiometric Table located in the Monitoring Workbook.
6. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the Monitoring Workbook.
7. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the Monitoring Workbook.

Attachment 3 – Laboratory Analytical Reports

Laboratory Reports from this monitoring period shall be submitted (segregated by sampling event and in chronological order).

- 1. Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
- 2. Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
- 3. Water Supply Well and/or Surface Water Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 4 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 5 – Water Use Survey Sheets (if applicable)

If applicable, provide any new Water Use and Receptor Survey Sheets completed as part of the Receptor Survey.

Attachment 6 – Updated Vapor Hazard (if applicable)

Provide any documentation required due to a new vapor hazard identified during site activities.

g. Closure Monitoring Report (CMR) Template



**Division of Underground
Storage Tanks**

CLOSURE MONITORING REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page**

Attachment 1

1.	Site Map	_____
2.	Soil Analytical Results Maps	_____
3.	Groundwater Analytical Results Maps	_____
4.	Horizontal Extent of Soil Contamination Map(s) (if applicable)	_____
5.	Horizontal Extent of Groundwater Contamination Map(s) (if applicable)	_____
6.	Potentiometric Maps	_____
7.	Vapor Monitoring Map	_____
8.	Receptor Map	_____

Attachment 2

1.	Applicable Cleanup Levels for COCs Table	_____
2.	Soil Analytical Results Table	_____
3.	Groundwater Analytical Results Table	_____
4.	Water Supply Well and/or Surface Water Analytical Results Table (if applicable)	_____
5.	Potentiometric Table	_____
6.	Free Product Removal Table (if applicable)	_____
7.	Vapor Monitoring Results Table	_____

Attachment 3

1.	Laboratory Analytical Reports (soil and/or water)	_____

Attachment 4

1. Field Documentation

Attachment 5

1. Water Use Survey Sheets (if applicable)

Attachment 6

1. Updated Vapor Hazard Documentation (if applicable)

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3. Water Supply Well and/or Surface Water Laboratory Analytical Report(s)	
Attachment 4 - Field Documentation	
Attachment 5 - Water Use Survey Sheets (if applicable)	
Attachment 6 - Updated Vapor Hazard Documentation (if applicable)	

To complete the tables in this report, open the Monitoring Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click the paperclip located on the sidebar panel and select the appropriate workbook.

A. Executive Summary

Provide a summary that, at a minimum, describes the findings of the project to date, discusses new impacts, changes at the site, and contaminant concentration trends for soil and/or water.

B. Applicable SSCLs

Provide a summary of the maximum groundwater concentrations for each COC identified during this sampling event, the maximum soil concentrations for each COC from the most recent sampling event, and approved SSCLs.

C. Soil Results

Provide a summary of all soil boring results to date including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc. Document all changes and trends based on the results. If applicable, provide a detailed summary discussing any new soil investigation activities that occurred during this monitoring period.

D. Water Results

Provide a detailed discussion of water sampling activities (e.g., drinking water and/or surface water impact, the occurrence of free product, etc.) that have occurred at this site. Provide a detailed summary discussing any new groundwater investigation activities that occurred during this monitoring period.

E. Free Product Data

If applicable, provide a detailed discussion of all free product occurrences and recovery activities to date. If free product was encountered during this monitoring period, at a minimum, provide where free product was detected and where it has been detected historically. Document all changes and trends based on the results.

F. Potentiometric Data

Provide a detailed discussion of the groundwater measurements from the current monitoring period. Provide a comparison of current measurements to historical measurements. Provide a summary of all gauging events to date, including changes and trends (i.e. depth to water is shallower or deeper than historically, rain events occurrences, seasonal fluctuations, etc.)

G. Vapor Monitoring Results

Provide a summary and description of all vapor monitoring of above ground and/or subsurface structures (e.g., basements, utility vaults, sewers, etc.) within 300 feet of the site and any other locations previously impacted by petroleum vapors. If new vapor impacts were identified, provide documentation that it was handled in accordance with [section VI.D.2](#) Vapor Hazards of the Guidance Manual. Any new petroleum vapor impacts shall be discussed. Document all changes and trends based on the results.

H. Receptor Monitoring Results

A receptor survey shall be completed once per calendar year. Provide a discussion of the most recent receptor survey conducted. If a change in a receptor is identified, or a new receptor is identified, complete the applicable Water Use and Receptor Survey Sheet located in [Appendix 1.d](#).

I. Management of Investigative Derived Waste

1. Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil removed.
2. Provide information concerning the amount and management (storage, treatment, and/or disposal) of water removed.
3. Provide information concerning the amount and management (storage, treatment, and/or disposal) of free product removed.

J. Additional Information and Recommendations

Provide a discussion of any additional information, assessments, and/or recommendations concerning the site monitoring activities and/or site data (e.g. a monitoring well has been paved over or has sustained damage, additional site characterization is recommended, etc.).

Signature Page**CLOSURE MONITORING REPORT**

A signature page, as shown below, shall be attached to the Closure Monitoring Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

- 1. Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
- 2. Soil Analytical Results Map** – Provide a scaled plan view map that summarizes the applicable COC concentrations from the most recent soil sampling event. Include all information provided on the site map.
- 3. Groundwater Analytical Results Map** – Provide a scaled plan view map that summarizes the applicable COC concentrations from the most recent groundwater sampling event. Include all information provided on the site map.
- 4. Horizontal Extent of Soil Contamination Map(s)** – If applicable, provide a separate, contoured, scaled plan view map showing the horizontal extent for each COC that exceeds the applicable SSCL based on the most current soil sampling event. Contour each map to the appropriate SSCL of the COC. Indicate the COC soil source width parallel to groundwater flow direction with an arrow that depicts that width in feet. The map(s) shall also contain all site map requirements.
- 5. Horizontal Extent of Groundwater Contamination Map(s)** – If applicable, provide a separate, plan view scaled site map showing the horizontal extent and most recent concentration for each COC that exceeds the applicable SSCL **in more than one well**. Contour each map to the appropriate SSCL of the COC. The horizontal extent and thickness (in feet) of any free product shall be depicted on each map. Indicate the COC groundwater source width perpendicular to groundwater flow direction with an arrow that depicts this distance in feet. The map(s) shall also contain all site map requirements. If multiple aquifers have been impacted, then provide a separate plan view map for each aquifer.
- 6. Potentiometric Maps** - Provide two (2) scaled site maps that include potentiometric data collected during the current and previous monitoring events. If multiple aquifers were investigated and sufficient data is generated, include potentiometric maps for each aquifer. Contour the potentiometric data on each map and include arrows depicting the interpreted direction(s) of groundwater flow. Record all measurements to 0.01 feet including the depth of the well. If free product is present, depict the horizontal extent on the potentiometric map(s).
- 7. Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g.

basements, utility vaults, sewers, etc.) within 300 feet of known contamination above the applicable SSCL. Indicate the 300-foot line with a dashed line.

8. **Receptor Map** - Provide a scaled receptor map of the area depicting the nearest current residential and commercial off-site receptors for each applicable pathway. Draw an arrow to each receptor from the monitoring well with the highest benzene concentration and depict the distance to each receptor in feet. Identify the nearest drinking water receptors by user name and identification number from the water use survey sheets included in [Appendix 1.d](#). If benzene concentrations are below laboratory analytical detection limits, then draw the arrow from the monitoring well with the highest COC concentration based on the following order: toluene, ethylbenzene, total xylenes, Methyl Tertiary Butyl Ether (MtBE), naphthalene, Polycyclic Aromatic Hydrocarbons (PAHs).

Attachment 2 – Tables

1. **Applicable Cleanup Levels for COCs Table** – Provide the approved SSCLs and maximum concentrations from the last sampling event for soil and groundwater in the Applicable Cleanup Levels for Chemicals of Concern (COC) Table located in the Monitoring Workbook. Identify which COCs have exceeded the SSCLs by shading the appropriate box.
2. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the Monitoring Workbook.
3. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the Monitoring Workbook.
4. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the Monitoring Workbook.
5. **Potentiometric Table** – Provide all water level data in the Potentiometric Table located in the Monitoring Workbook.
6. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the Monitoring Workbook.
7. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the Monitoring Workbook.

Attachment 3 – Laboratory Analytical Reports

Laboratory Reports from this monitoring period shall be submitted (segregated by sampling event and in chronological order).

- 1. Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
- 2. Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
- 3. Water Supply Well and/or Surface Water Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 4 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 5 – Water Use Survey Sheets (if applicable)

Provide any new Water Use and Receptor Survey Sheets completed as part of the Receptor Survey.

Attachment 6 – Updated Vapor Hazard (if applicable)

Provide any documentation required due to a new vapor hazard identified during site activities.

h. Standard Boring Log Template



**Division of Underground
Storage Tanks**

STANDARD BORING LOG

To view the Standard Boring Log Template, open the Standard Boring Log-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

Complete the sections of the boring log as follows:

<u>Facility Name:</u>	Facility name where the tank(s) are/were located
<u>Lat/Long or Northing/Easting:</u>	Latitude and Longitude or Northing and Easting
<u>TN Fac. ID #:</u>	Seven-digit number assigned to the facility by the Division
<u>Well &/or Boring #:</u>	Well and/or boring number consistently referenced throughout all reports and plans
<u>Location Map:</u>	Site sketch showing the well or boring location in relation to buildings, tank pit(s), and other important features
<u>Start Date & Time:</u>	Date and time that drilling began
<u>Comp. Date & Time:</u>	Date and time of boring or well completion
<u>Logged By:</u>	Name of the Tennessee registered professional engineer (P.E.) or Tennessee registered professional geologist (P.G.) logging the well and/or boring
<u>P.E./P.G. TN Lic. #:</u>	Tennessee license number of the P.E. or P.G. logging the well/boring
<u>Drilling Company:</u>	Name of drilling company
<u>Driller:</u>	Driller's name
<u>TN Lic. #:</u>	License number of the Tennessee licensed well driller
<u>Drilling Method:</u>	Drilling method(s) used to complete the boring or monitoring well
<u>Project #:</u>	Section provided for the convenience of the company or professional completing the log

<u>OVD Make/Model:</u>	Make and model of the organic vapor detector (OVD) being used to screen for volatiles
<u>Date OVD Calibrated:</u>	Date of last OVD calibration
<u>Elev. (MSL):</u>	Elevation of the top of the boring or well relative to mean sea level (MSL)
<u>T.D. (MSL):</u>	Elevation of the bottom of the boring or well relative to MSL
<u>Comments:</u>	Any pertinent information not included in the columns provided on the boring log
<u>MSL:</u>	Elevation in feet relative to mean sea level
<u>Completion Diagram:</u>	Detailed monitoring well schematic will indicate, but not be limited to, the type and diameter of the well, borehole diameter, depth of borehole, depth of well, type of casing and screen, slotted screen size, grain size of sand pack, depth to top of screen, depth to top of sand pack, and depth to top of bentonite seal (Symbols in Table 1)
<u>Water Level:</u>	Water level first encountered during drilling and after completion of the well (Symbols in Table 1)
<u>Depth:</u>	Depth in feet below ground level
<u>Graphic Lithology:</u>	Soil and/or rock lithology. If applicable, include symbols for secondary porosity, intrusions, structural characteristics, etc. All symbols are provided in Table 1
<u>OVD:</u>	OVD reading from headspace analysis
<u>Samples:</u>	
<u>Type</u>	Type of sample indicated (SS-split spoon, CS-continuous, or DP-direct push)
<u>Int/Rec</u>	Sample interval and amount recovered (Symbols in Table 1)
<u>Lab</u>	Sample interval submitted for laboratory analysis
<u>Description:</u>	Description of the soil and/or rocks is to include, but not be limited to, the following (Abbreviations for descriptive terms are listed in Table 2):
<u>Rock Type/Soil Type</u>	Primary and secondary lithologies

Composition/Texture Size and shape of the particles, cement and matrix, etc.

Strength/Consistency Strength, compaction, etc.

Color Primary color and changes in color

Moisture Moisture content and changes in moisture content

Origin Determine if the soil is residual (weathered in place from parent material) or has been transported and deposited. Transported and deposited soils include alluvium, colluvium, loess, glacial till or drift, and man-made fill.

Structure Type of bedding, weathering, voids, and secondary porosity

i. **Impacted Drinking Water – Hazard Management Report (IDW-HMR)
Template**



**Division of Underground
Storage Tanks**

**IMPACTED DRINKING WATER – HAZARD
MANAGEMENT REPORT**

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	<u>Included(Yes/No)</u>
All Information Listed Below and Completed Signature Page	_____
<u>Attachment 1</u>	
1. Site Map	_____
2. Vicinity Map	_____
<u>Attachment 2</u>	
1. Petroleum Impacted Drinking Water Supply Analytical Results Table	_____
2. Free Product Removal Table (if applicable)	_____
<u>Attachment 3</u>	
1. Laboratory Analytical Reports	_____
<u>Attachment 4</u>	
1. Well Driller Log(s) of the Impacted Water Supply(ies)	_____
<u>Attachment 5</u>	
1. Field Documentation	_____

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1. Petroleum Impacted Drinking Water Supply Laboratory Analytical Reports	
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Attachment 5 Field Documentation.....	
Attachment 6 – Disposal Manifests (if applicable).....	

To complete the tables in this report, open the Monitoring Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click the paperclip located on the sidebar panel and select the appropriate workbook.

A. Facility and General Information

1. Date of Report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Subcontractor(s) including, but not limited to, plumber, water treatment company, licensed well driller and/or licensed pump installer responsible for impacted drinking water management. Provide Subcontractor Name, License, and Contact Information:

B. Petroleum Impacted Drinking Water Supply History

1. Date impacted drinking water discovered:
2. Date impacted drinking water confirmed:
3. Date impacted drinking water reported to the Division:
 - a) Method of contact:
 - b) Division personnel contacted:
 - c) Reported by:
4. Type of impacted water supply (e.g. private, public, well, spring, surface water, other):
5. Location(s) of impacted drinking water supply(ies). Name(s), address(es) and telephone number(s), if applicable, of locations where impacted drinking water supply(ies) was/were discovered:
6. Type of petroleum impact(s) to drinking water supply(ies) (e.g. gasoline, diesel, kerosene, aviation fuel, crude oil, waste oil, unknown, other):
7. Provide any details about the construction of the water supply well if a driller's log is not available, including but not limited to depth of well, depth of casing, screen placement, placement of pump, recent pump repairs, etc., if applicable.
8. Provide the construction material of the supply water line, if known.

9. Provide any details about the impacted spring or surface water supply, if applicable.

C. Petroleum Impacted Drinking Water Supply Management

1. Provide the date the initial response activities were implemented and terminated (if applicable) and a detailed description of all activities.
2. Provide the date the permanent response activities were implemented and a detailed description of all activities.

DRAFT

Signature Page**HAZARD MANAGEMENT REPORT**

A signature page, as shown below, shall be attached to the Hazard Management Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
2. **Vicinity Map** – Provide a scaled map that depicts the locations of all streets, buildings, subsurface structures, utilities, drinking water wells, and surface water bodies within one-tenth (0.1) mile from the site. Label the locations of all identified hazards.

Attachment 2 – Tables

1. **Water Supply Well/Surface Water Analytical Results Table** – Provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the Monitoring Workbook.
2. **Free Product Removal Table** – If applicable, provide all free product removal data in the Free Product Removal Table located in the Monitoring Workbook. If free product was not removed at a location listed in the Free Product Removal table, explain why the product was not removed.

Attachment 3 – Laboratory Analytical Reports

All Laboratory Reports shall be submitted (segregated by sampling event and in chronological order).

1. **Petroleum Impacted Drinking Water Supply Laboratory Analytical Reports-**
At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.

Attachment 4 – Well Driller Log(s) of the Impacted Water Supply(ies)

Provide all available Well Driller Logs and any other pertinent information for the impacted water supply(ies).

Attachment 5 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 6 – Disposal Manifests (if applicable)

Provide a copy of all disposal manifests for the recovered free product, liquids, soils, pads, booms, etc.

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j. **Petroleum Vapor Impact – Hazard Management Report (PVI-HMR)
Template**



**Division of Underground
Storage Tanks**

**PETROLEUM VAPOR IMPACT – HAZARD
MANAGEMENT REPORT**

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	<u>Included(Yes/No)</u>
All Information Listed Below and Completed Signature Page	_____
<u>Attachment 1</u>	
1. Site Map	_____
2. Vicinity Map	_____
3. Vapor Monitoring Map	_____
<u>Attachment 2</u>	
1. Vapor Monitoring Results Table	_____
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1. Vapor Monitoring Results Table	
Attachment 3 - Field Documentation.....	

To complete the tables in this report, open the Monitoring Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click the paperclip located on the sidebar panel and select the appropriate workbook.

A. Facility and General Information

1. Date of Report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Subcontractor(s) responsible for petroleum vapor impact management and contact information (e.g. contact person, phone number, and email address):

B. Petroleum Vapor Impact History

1. Date petroleum vapor impact discovered:
2. Date petroleum vapor impact reported to the Division:
 - a) Method of contact:
 - b) Name of Division personnel contacted:
 - c) Reported by:
3. Location(s) of petroleum vapor impact(s) (e.g. residence, commercial/public building, sanitary sewer, storm sewer, utility vault, other):
4. Name(s), address(es) and telephone number(s), if applicable, of locations where petroleum vapor impact(s) was/were discovered:
5. If applicable, provide any details about the construction of the petroleum vapor impacted receptor:

C. Petroleum Vapor Impact Response Management

1. Provide the date the initial response activities were implemented and terminated (if applicable) and a detailed description of all activities.
2. Provide the date the permanent response activities were implemented and a detailed description of all activities.

Signature Page**HAZARD MANAGEMENT REPORT**

A signature page, as shown below, shall be attached to the Hazard Management Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines. Depict the free product location(s) that are included on the Free Product Removal Table on the site map.
2. **Vicinity Map** – Provide a scaled map that depicts the locations of all streets, buildings, subsurface structures, utilities, drinking water wells, and surface water bodies within one-tenth (0.1) mile from the site. Label the locations of all identified hazards. Depict the free product location(s) that are included on the Free Product Removal Table on the vicinity map.
3. **Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g. basements, utility vaults, sewers, etc.) within 300 feet of known contamination. Indicate the 300-foot line with a dashed line.

Attachment 2 – Tables

1. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the Monitoring Workbook.

Attachment 3 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

k. Free Product – Hazard Management Report (FP-HMR) Template



**Division of Underground
Storage Tanks**

**FREE PRODUCT – HAZARD
MANAGEMENT REPORT**

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	<u>Included(Yes/No)</u>
All Information Listed Below and Completed Signature Page	_____
<u>Attachment 1</u>	
1. Site Map	_____
2. Vicinity Map	_____
3. Vapor Monitoring Map	_____
<u>Attachment 2</u>	
1. Vapor Monitoring Results Table	_____
2. Free Product Removal Table	_____
<u>Attachment 3</u>	
1. Field Documentation	_____
<u>Attachment 4</u>	
1. Disposal Manifests (if applicable)	_____

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2. Vicinity Map.....	
3. Vapor Monitoring Map.....	
Attachment 2 - Tables	
1. Vapor Monitoring Results Table	
2. Free Product Removal Table.....	
Attachment 3 - Field Documentation.....	
Attachment 4 - Disposal Manifests (if applicable).....	

To complete the tables in this report, open the Monitoring Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click the paperclip located on the sidebar panel and select the appropriate workbook.

A. Facility and General Information

1. Date of Report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Subcontractor(s) responsible for free product management and contact information:

B. Release History

1. Date release confirmed:
2. Date release reported to the Division:
 - a) Method of contact:
 - b) Name of Division personnel contacted:
 - c) Reported by:
3. Type of petroleum released (e.g. gasoline, diesel, kerosene, waste oil, aviation fuel, other):
4. Source of release (e.g. UST, line, dispenser, fill port area, sump area, etc.):
5. Date free product discovered:
6. Date free product discovery reported to the Division:
 - a) Method of contact:
 - b) Division personnel contacted:
 - c) Reported by:
7. Location where free product was discovered (e.g. drinking water supply, basement and/or confined space, surface water, ground surface, monitoring well(s) recovery well(s), observation well(s), UST system, utilities, excavation, etc.):

8. Address(es) and telephone number(s), if applicable, of locations where free product was discovered:
9. Provide specific details about the release point, if known (i.e. Tank #2, line leak detector failure, regular unleaded flex connector failure at dispenser #3, etc.):
10. Volume of the release (in gallons, known or estimated):
11. Describe actions taken to prevent further release to the environment (i.e. removal of product from tank, repair to or removal of the tank system, etc.) and prevent further migration of the petroleum (i.e. removal of free product, removal of contaminated soil, etc.)

C. Free Product Management

1. Date initial free product response activity was initiated:
2. Describe the type of initial free product response activities:
3. Date initial response activity was terminated, if applicable:
4. Describe the method and location of disposal for the recovered free product, liquids, soils, pads, booms, etc. (attach disposal manifests in the applicable attachment):
5. If applicable, describe the location(s) and/or thickness(es) of any free product that is still present twenty-four (24) hours after the termination of the initial free product removal activities:

Signature Page**HAZARD MANAGEMENT REPORT**

A signature page, as shown below, shall be attached to the Hazard Management Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines. Depict the free product location(s) and thicknesses that are included on the Free Product Removal Table on the site map.
2. **Vicinity Map** – Provide a scaled map that depicts the locations of all streets, buildings, subsurface structures, utilities, drinking water wells, and surface water bodies within one-tenth (0.1) mile from the site. Label the locations of all identified hazards. Depict the free product location(s) that are included on the Free Product Removal Table on the vicinity map.
3. **Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g. basements, utility vaults, sewers, etc.) within 300 feet of known contamination. Indicate the 300-foot line with a dashed line.

Attachment 2 – Tables

1. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the Monitoring Workbook.
2. **Free Product Removal Table** – Provide all free product removal data in the Free Product Removal Table located in the Monitoring Workbook. If free product was not removed at a location listed in the Free Product Removal table, explain why the product was not removed.

Attachment 3 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 4 – Disposal Manifests (if applicable)

Provide a copy of all disposal manifests for the recovered free product, liquids, soils, pads, booms, etc.

I. Free Product Investigation Plan (FPIP) Template



**Division of Underground
Storage Tanks**

FREE PRODUCT INVESTIGATION PLAN

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page**

Attachment 1

1. Site Map
2. Vicinity Map
3. Potentiometric Maps
4. Site Map Wells

Attachment 2

1. Soil Analytical Results Table
2. Groundwater Analytical Results Table
3. Water Supply Well and/or Surface Water Analytical Results Table (if applicable)
4. Free Product Removal Table
5. Potentiometric Table

Attachment 3

1. Boring Logs

Attachment 4

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3. Water Supply Well and/or Surface Water Analytical Results Table (if applicable)	
4. Free Product Removal Table.....	
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Attachment 3 – Boring Logs	
Attachment 4 - Laboratory Analytical Reports.....	
1. Soil Laboratory Analytical Report(s).....	
2. Groundwater Laboratory Analytical Report(s)	
3. Water Supply Well and/or Surface Water Laboratory Analytical Report(s) (if applicable)	
Attachment 5 – Field Documentation.....	

To complete the tables in this report, open the Monitoring Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click the paperclip located on the sidebar panel and select the appropriate workbook.

A. Facility and General Information

1. Date of Proposal:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:

B. Background Information

1. Provide a description of the geology and hydrology of the site.
2. Provide a detailed discussion of all free product occurrences and recovery activities to date. At a minimum, provide where free product was detected and where it has been detected historically. Document all changes and trends based on the results.

C. Number, Type and Location of Monitoring Wells to Determine the Extent of Free Product

To determine the extent of free product, submit a proposal to install up to six (6) monitoring wells on a 25 foot square grid pattern extending from the source area. If the proposal adjusts the grid pattern distances based on site limitations, include a justification for the proposed deviation(s). These wells are in addition to the four wells installed for the initial release investigation. If the free product plume is not defined to 0.01 feet after these wells are installed, additional wells may be required by the Division.

Signature Page**FREE PRODUCT INVESTIGATION PLAN**

A signature page, as shown below, shall be attached to the Free Product Investigation Plan. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines. Depict the free product location(s) and thicknesses that are included on the Free Product Removal Table on the site map.
2. **Vicinity Map** – Provide a scaled map that depicts the locations of all streets, buildings, subsurface structures, utilities, drinking water wells, and surface water bodies within one-tenth (0.1) mile from the site. Label the locations of all identified hazards. Depict the free product location(s) that are included on the Free Product Removal Table on the vicinity map.
3. **Potentiometric Maps** – Provide two (2) scaled potentiometric maps derived from data collected at least thirty (30) days apart. If multiple aquifers were investigated due to the presence of contamination in a deeper aquifer and sufficient data is generated, then include potentiometric maps for each aquifer. Depict the interpreted direction of groundwater flow with an arrow(s).
4. **Site Map with Proposed Wells** - Provide a site map with the proposed location of a maximum of six (6) additional wells to assess the extent of free product.

Attachment 2 – Tables

1. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the Monitoring Workbook.
2. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the Monitoring Workbook.
3. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the Monitoring Workbook.
4. **Free Product Removal Table** – Provide all free product removal data in the Free Product Removal Table located in the Monitoring Workbook. If free product was not removed at a location listed in the Free Product Removal table, explain why the product was not removed.

- 5. Potentiometric Table** – Provide all water level data in the Potentiometric Table located in the Monitoring Workbook.

Attachment 3 – Boring Logs

Provide all detailed boring logs and monitoring well construction logs completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 4 – Laboratory Analytical Reports

All Laboratory Reports to date shall be submitted (segregated by sampling event and in chronological order).

- 1. Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
- 2. Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
- 3. Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 5 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

m. Free Product Investigation Report (FPIR) Template



**Division of Underground
Storage Tanks**

FREE PRODUCT INVESTIGATION REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page**

Attachment 1

1.	Site Map	_____
2.	Vicinity Map	_____
3.	Surveyor Map	_____
4.	Vapor Monitoring Map	_____
5.	Topographic Map	_____
6.	Receptor Map	_____
7.	Bedrock Contour Map (if applicable)	_____
8.	Horizontal Extent of Soil Contamination Map(s)	_____
9.	Horizontal Extent of Groundwater Contamination Map(s)	_____
10.	Potentiometric Maps	_____

Attachment 2

1.	Soil Analytical Results Table	_____
2.	Groundwater Analytical Results Table	_____
3.	Water Supply Well and/or Surface Water Analytical Results Table (if applicable)	_____
4.	Free Product Removal Table (if applicable)	_____
5.	Water Use Determination Analytical Results Table (if applicable)	_____
6.	Potentiometric Table	_____

7. Vapor Monitoring Results Table

Attachment 3

1. Boring Logs (soil and/or monitoring well construction logs)

Attachment 4

1. Laboratory Analytical Reports (soil and/or water)

Attachment 5

1. Hydraulic Gradient Calculations

Attachment 6

1. Request for Approval of Revised SSCLS and RAR (if applicable)

Attachment 7

1. Field Documentation

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3. Hydrogeology.....	
4. Monitoring Well Construction, Development and Sampling.....	
5. Water Analytical Results.....	
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3. Surveyor Map.....	
4. Vapor Monitoring Map.....	
5. Topographic Map.....	
6. Receptor Map.....	
7. Bedrock Contour Map (if applicable)	
8. Horizontal Extent of Soil Contamination Map(s)	
9. Horizontal Extent of Groundwater Contamination Map(s).....	
10. Potentiometric Maps.....	
Attachment 2 – Tables	
1. Soil Analytical Results Table.....	
2. Groundwater Analytical Results Table.....	
3. Water Supply Well and/or Surface Water Analytical Results Table (if applicable)	
4. Free Product Removal Table (if applicable).....	
5. Water Use Determination Analytical Results Table (if applicable).....	
6. Potentiometric Table.....	
7. Vapor Monitoring Results Table.....	
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Attachment 4 - Laboratory Analytical Reports.....	
1. Soil Laboratory Analytical Report(s).....	

2. Groundwater Laboratory Analytical Report(s).....
3. Water Supply Well and/or Surface Water Laboratory Analytical Report(s)
(if applicable).....

Attachment 5 – Hydraulic Gradient Calculations.....

**Attachment 6 – Request for Approval of Revised SSCLs and Risk Analysis Report (if
applicable).....**

Attachment 7 – Field Documentation

**To complete this report, open the ISCR Workbook-Final.xlsx, as well as
the Risk Analysis Report.xls, and Reference Tables.xls Excel files in the
Attachments Panel of the Guidance Manual, if applicable. Click on the
paperclip located on the sidebar panel and select the appropriate file.**

A. Executive Summary

Provide a summary describing the findings of the project to date. Include conclusions and interpretations of data derived from implementing the environmental assessment activities. Identify all impacts resulting from the release.

B. Facility and General Information

1. Date of Report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:

C. Background Information

Provide a brief site history emphasizing information that has not been stated in prior reports or information that has been revised based upon new findings. Include the following, at a minimum:

1. A summary of all free product initial response activities; and,
2. A summary of actions taken to define the extent of free product.

D. Soil Investigation

Provide a summary of all soil investigation activities to date. This summary should include, but not be limited to, the results of the release investigation, closure activities, site check investigation, any soil source removals, etc. Provide a discussion of potential source areas (e.g., tanks lines dispensers, etc.) and/or past releases.

1. Geology

Provide the following information:

- a) A description of the regional geologic section;
- b) A description of the geologic section at the site;
- c) A description of the soil and/or bedrock lithologies encountered at the site and its relation to the contaminant plume distribution;

- d) If bedrock is encountered, include a discussion of the strike and dip of the bedrock at the site and its effects on plume migration. Reference the plan view map of the bedrock contour (Attachment 1).

2. Soil Results

- a) Provide a discussion of the predominant lithology in both the vadose and capillary fringe zones at the site. These lithology types will be utilized as input parameters in the Division's RAR.
- b) Describe the methods and procedures used to drill and sample all soil borings.
- c) Provide a summary of all soil boring results to date including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc. Document all changes and trends based on the results.

E. Water Investigation

Provide a summary of all activities concerning the surface and groundwater investigation to date. This should include, but not be limited to the results of the release investigation, closure activities, site check investigation, any interim corrective action, etc.

1. Location and Current Use of Groundwater

- a) State the current groundwater usage of the impacted groundwater (e.g. drinking water supply or non-drinking water supply) at the time of the FPIR preparation.
- b) Discuss the reasonably expected future use of groundwater at this site (Note: If the impacted groundwater at the site is not currently used as drinking water, then it **is not reasonable** to expect that the groundwater at the site will be used as drinking water in the future).

2. Location and Current Use of Surface Waters

- a) Discuss any current use(s) of the surface waters within a one-half (0.5) mile radius of the site (e.g., drinking water supply, recreational, etc.)
- b) Discuss the reasonable expected future use(s) of surface waters near the site (Note: If the impacted surface waters at the site are not currently used as drinking water, then it **is not reasonable** to expect that the surface waters at the site will be used as drinking water in the future).

3. Hydrogeology

- a) Describe the occurrence and movement of groundwater at the site and its relationship to both soil and groundwater contamination. Include conclusions concerning the relationship of this site to any areas of contamination extending beyond the UST property, if applicable. Discuss the presence of any hydrogeologic barriers that may affect contaminant migration. Include potential or known impact to designated wellhead protection areas and/or nearby drinking water supplies.
- b) If the site is located in an area with carbonate bedrock, or if caves, springs, sinking streams or other karst features exist within a one-half (0.5) mile radius of the site, then provide conclusions concerning how this may affect groundwater movement at the site. Include in this discussion any evidence of petroleum migrating through karst systems, estimated travel times, evidence of impacted water supply wells, contaminated springs, or evidence of petroleum migrating into nearby streams.
- c) Describe the occurrence and movement of surface water near the site and its relationship to both soil and groundwater contamination. Include conclusions concerning the relationship of this site to any areas of off-site contamination, if applicable.
- d) Describe the occurrence and movement of free product at the site.
- e) Provide the highest calculated hydraulic gradient from the most recent gauging event. Calculations shall be included in Attachment 5.

4. Monitoring Well Construction, Development, and Sampling

- a) Describe the monitoring well installation procedures.
- b) Describe the procedures used to develop all monitoring wells..
- c) Describe the procedures used to sample all monitoring wells including purging, sampling, and chain of custody protocols.

5. Water Analytical Results

Provide a summary of all water analytical results to date including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc. Document all changes and trends based on the results.

6. Water Use Determination Procedures

Provide a summary of all water use and karst survey results as previously documented. If applicable, discuss the results of the primary and secondary water analytical results or any additionally required steps to determine water use for the facility.

F. Vapor Monitoring

Provide a summary of all vapor monitoring results to date. Document all changes and trends based on the results. If permanent vapor abatement solutions were implemented, provide a summary of the abatement activities.

G. Applicable Cleanup Levels

If necessary, re-evaluate this site using the Division's Risk Analysis Report. Instructions for completing the spreadsheet are found in [section VI.F.a](#). Instruction for the Risk Analysis Report (spreadsheet completion) of the Guidance Manual. Include and discuss the results from the Summary Page of the RAR. Provide a table (located in the ISCR Workbook titled Proposed Site-Specific Cleanup Levels) summarizing the requested SSCLs. Provide an explanation as to how the groundwater source width perpendicular to groundwater flow (in centimeters) and the soil source width parallel to groundwater flow direction (in centimeters) input parameter was determined.

If the newly calculated SSCLs change, include a revised site-specific standard request in Attachment 6 in the format of a letter addressed to the Division Director. The letter shall contain the facility name, facility identification number, the tank owner of record at the time of the release, the date of the report, a summary statement containing the proposed cleanup levels, and all the pages from the completed RAR.

H. Proposed Additional Monitoring Wells

If the extent of free product is not defined to 0.01 feet, include a proposal with costs to install and sample up to four (4) additional monitoring wells. Include the well placement grid (in accordance with the FPIP) to be used in the investigation of the extent of free product for the FPIR.

I. Management of Investigative Derived Waste

1. Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil removed.

2. Provide information concerning the amount and management (storage, treatment, and/or disposal) of water removed.
3. Provide information concerning the amount and management (storage, treatment, and/or disposal) of free product removed.

J. Recommendations

Provide recommendations for the next course of action.

DRAFT

Signature Page**FREE PRODUCT INVESTIGATION REPORT**

A signature page, as shown below, shall be attached to the Free Product Investigation Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

- 1. Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
- 2. Vicinity Map** - Provide a vicinity map of the area depicting the site location, all streets, buildings, subsurface structures, utilities, and surface water bodies within one-tenth (0.10) mile of the site. If drinking water supplies are adjacent to the UST site, then include those locations. Include a legend on the map detailing the identification number, user's name and the parcel number.
- 3. Surveyor Map** - Provide the Tennessee Licensed Surveyor's Map generated from the Professional Survey. This map shall depict the distances and angles (relative to magnetic north) from the source well to the established and documented point on the top of each well casing.
- 4. Topographic Map** - Provide a color topographic map with the site location indicated and the locations of all drinking water supplies (wells, springs, and/or surface water bodies) within a one-half (0.5) mile radius of the UST site. Identify each drinking water supply with the well identification number. Include a legend on the map detailing the identification number, user's name and the parcel number. Depict the one-tenth (0.1) and one-half (0.5) mile radii from the UST site on the topographic map.
- 5. Receptor Map** - Provide a scaled receptor map of the area depicting the nearest current residential and commercial off-site receptors for each applicable pathway. Draw an arrow to each receptor from the monitoring well with the highest benzene concentration and depict the distance to each receptor in feet. Identify the nearest drinking water receptors by user name and identification number from the water use survey sheets included in [Appendix 1.d](#). If benzene concentrations are below laboratory analytical detection limits, then draw the arrow from the monitoring well with the highest COC concentration based on the following order: toluene, ethylbenzene, total xylenes, Methyl Tertiary Butyl Ether (MtBE), naphthalene, Polycyclic Aromatic Hydrocarbons (PAHs).
- 6. Bedrock Contour Map** – If applicable, provide a plan view map showing the bedrock contour based on depths at which bedrock was encountered during the advancement of soil borings and monitoring wells. The map shall contain all site map requirements.

7. **Horizontal Extent of Soil Contamination Map(s)** - Provide a separate, contoured, scaled plan view map showing the horizontal extent for each COC that exceeds the applicable SSCL based on the most current soil sampling event. Contour each map to the appropriate SSCL of the COC. Indicate the COC soil source width parallel to groundwater flow direction with an arrow that depicts that width in feet. The map(s) shall also contain all site map requirements.
8. **Horizontal Extent of Groundwater Contamination Map(s)** - Provide a separate, plan view scaled site map showing the horizontal extent and most recent concentration for each COC that exceeds the applicable SSCL **in more than one well**. Contour each map to the appropriate SSCL of the COC. The horizontal extent and thickness (in feet) of any free product shall be depicted on each map. Indicate the COC groundwater source width perpendicular to groundwater flow direction with an arrow that depicts this distance in feet. The map(s) shall also contain all site map requirements. If multiple aquifers have been impacted, then provide a separate plan view map for each aquifer.
9. **Potentiometric Maps** - Provide two (2) scaled potentiometric maps derived from data collected at least thirty (30) days apart. If multiple aquifers were investigated due to the presence of contamination in a deeper aquifer and sufficient data is generated, then include potentiometric maps for each aquifer. Depict the interpreted direction of groundwater flow with an arrow(s).

Attachment 2 – Tables

1. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the ISCR Workbook.
2. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the ISCR Workbook.
3. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the ISCR Workbook.
4. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the ISCR Workbook.
5. **Water Use Determination Analytical Results Table** – If applicable, provide all analytical results used to determine if the impacted aquifer or water supply met the primary or secondary drinking water standards in the Water Use Determination Table located in the ISCR Workbook.

6. Potentiometric Table – Provide all water level data in the Potentiometric Table located in the ISCR Workbook.

7. Vapor Monitoring Results Table – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the ISCR Workbook.

Attachment 3 - Boring Logs

Provide all detailed boring logs and monitoring well construction logs completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 4 - Laboratory Analytical Reports

All Laboratory Reports to date shall be submitted (segregated by sampling event and in chronological order).

- 1. Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
- 2. Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
- 3. Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 5 – Request for Approval of Revised SSCLs and Risk Analysis Report (if applicable)

Provide a Revised Site-Specific Standard Request in the format of a letter addressed to the Division Director. The letter shall contain the facility name, facility identification number, the tank owner of record at the time of the release, the date of the report, a summary statement containing the proposed cleanup levels (SSCLs), and all the pages from the revised RAR. Provide the completed Proposed Site-Specific Cleanup Levels Table located in the ISCR Workbook. Provide all the pages from the revised RAR.

Attachment 6 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

DRAFT

n. Soil Gas Survey Application Template



**Division of Underground
Storage Tanks**

SOIL GAS SURVEY APPLICATION

THIS APPLICATION IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	Included (Yes/No)
All Information Listed Below and Completed Signature Page	_____

Attachment 1

1. Site Map	_____

DRAFT

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A. Facility and General Information	Page Number
B. Proposed Soil Gas Survey Points.....	
C. Field Procedures	
Signature Page	
Attachment 1 - Figures.....	
1. Site Map.....	

DRAFT

A. Facility and General Information

1. Date of application:
2. Facility ID Number:
3. Facility Name:
4. Name of subcontractor (if applicable) (e.g. name, address, phone number and email):
5. Date the soil gas survey will be conducted:
6. Provide the type of existing onsite building(s) (e.g. commercial, residential, N/A).
7. Provide the existing foundation type(s) (e.g. basement, crawlspace, slab-on-grade, N/A).
8. Provide the reasonably expected future property usage (e.g. commercial, residential).

B. Proposed Soil Gas Survey Points

1. List the borings/well numbers that have soil and/or groundwater contaminant concentrations that exceed the approved SSCLs.

Sample Location [†] (B-1, MW-1, etc.)	Sample Depth (feet)	Chemical of Concern	Concentration (ppm)	Approved SSCL (ppm)

[†] Depict these sample locations on the site map

2. Provide the number and depth of proposed soil gas sample locations (e.g. up to 4 points, 5-8 points, more than 8 points) and justification for each sample location.

C. Field Procedures

1. Provide the proposed probe installation method (e.g. rotary hammer drill, slide hammer, direct push technology). Specify equipment and brand.
2. Provide the probe tubing type and outside diameter (e.g. nylon, metal conduit (slide hammer), ¼-inch, 3/8-inch, ½-inch, other).
3. Provide the sample train tubing type and outside diameter (e.g. nylon, 1/8-inch, ¼-inch, other) and diameter.
4. Provide the type of tubing connections (e.g. ¼-inch, quick-connect plastic, other).
5. Provide the probe surface seal material (e.g. petroleum free modeling clay, hydrated bentonite, other).
6. Provide the type of tracer (e.g. Isopropanol (70% rubbing alcohol), other).
7. Provide the name of analytical laboratory.
8. Provide the type of laboratory analysis and the sample container typer (e.g. Method TO-15, 1-Liter SUMMA® Canisters, other).
9. Provide the type of purge equipment (e.g. hand vacuum pump, other).
10. Has the selected laboratory been notified that in addition to the requested petroleum constituents, Isopropanol, (%) Oxygen, and (%) Carbon Dioxide are required to be analyzed?

Signature Page**SOIL GAS SURVEY APPLICATION**

A signature page, as shown below, shall be attached to the Soil Gas Survey Application. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tanks, product and vent lines, dispensers, buildings, property boundaries, rights-of-way, access to or from the property, utility easements, building setbacks, subsurface structures, underground utilities (including all vaults and main and service lines), overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former UST systems with a dashed line. At a minimum include a north arrow, legend, and scale bar, and identify the roads around the site. Show the most recent soil and groundwater COC concentrations that exceed the approved SSCLs. Include proposed soil gas sample locations on the map.

o. Soil Gas Survey Report Template



**Division of Underground
Storage Tanks**

SOIL GAS SURVEY REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	Included(Yes/No)
All Information Listed Below and Completed Signature Page	_____
<u>Attachment 1</u>	
1. Site Map	_____
<u>Attachment 2</u>	
1. Soil Gas Survey Analytical Results Table	_____
<u>Attachment 3</u>	
1. Soil Gas Laboratory Analytical Report	_____
2. Sample Shipment Documentation	_____
<u>Attachment 4</u>	
1. Tennessee Soil Gas Lookup Table Printout(s)	_____
<u>Attachment 5</u>	
1. Soil Gas Survey Field Log	_____

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Attachment 3 - Laboratory Analytical Reports.....	
1. Soil Gas Laboratory Analytical Report	
2. Sample Shipment Documentation	
Attachment 4 - Tennessee Soil Gas Lookup Table Printout(s)	
Attachment 5 - Soil Gas Survey Field Log.....	

To complete this report, open the Tennessee Soil Gas Lookup Tables.xls Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate file.

A. Executive Summary

Include all results, facts and developments that occurred during the soil gas sampling event in the Executive Summary, including, but not limited to a discussion of the field operations, any deviations from the work plan specified [section VI.K](#) Soil Gas Survey of the Guidance Manual and/or approved application, any data inconsistencies, and any other significant procedural and/or analytical details.

B. Facility and General Information

1. Date of report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Describe the weather conditions (e.g., temperature, precipitation, etc.) during the soil gas survey event. Also describe the precipitation conditions during the 48 hour period immediately preceding the survey.
6. Identify and discuss the contaminant source areas (i.e., those areas that have analytical concentrations that exceed the SSCLs approved by the Division).
7. Identify and discuss all the applicable site receptors (e.g. residential and/or commercial).

C. Procedures

1. Describe the probe advancement methodology.
2. Describe the sample collection methodology, including specifications of the purging and sampling equipment used.
3. Describe any problems encountered (e.g., utility lines encountered, water encountered in samples, free product encountered, equipment malfunctions, etc.).
4. List the Corrective Action Contractor personnel that were on-site, their billing title(s), and total time at the site.
5. If applicable, list subcontractor personnel that were on-site, their billing title(s), and total time at the site.

D. Additional Information and Recommendations

Provide any additional information and recommendations based on the results of the soil gas survey.

DRAFT

Signature Page**SOIL GAS SURVEY REPORT**

A signature page, as shown below, shall be attached to the Soil Gas Survey Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Signature

Date

Title (Print)

PE, PG, or CAC (Print name)

Signature

Date

TN Registration #

CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines. Include the location of all soil gas survey points. Include the results of the analytical and tracer data on the site map.

Attachment 2 – Tables

1. **Soil Gas Survey Analytical Results Table** - provide all sample results in the [Soil Gas Survey Analytical Results Table](#). Instructions to complete this table are in the Soil Gas Survey Report Template.

Attachment 3 - Laboratory Analytical Reports

1. **Soil Gas Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
2. **Sample Shipment Documentation** – Provide all available sample shipment documentation that was generated to ship the samples to the approved laboratory for analysis.

Attachment 4 - Tennessee Soil Gas Lookup Table Printout(s)

Provide a copy of the applicable Tennessee Soil Gas Lookup Table, located in the excel file as noted on the Table of Contents page of the Soil Gas Survey Report Template.

Attachment 5 – Soil Gas Survey Field Log

Provide a copy of all original field documentation, including the [Soil Gas Survey Field Log and comments page](#) located in the Soil Gas Survey Report Template. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Instructions to Complete Table 1 - Analytical Results**Complete the following steps in sequence:**

1. Check the applicable receptor and foundation.
2. Delete any rows containing COCs that did not exceed the SSCLs in the Risk Analysis Report.
3. Enter the depth each sample was collected.
4. Select and enter the units ($\mu\text{g}/\text{m}^3$, ppbv, or ppmv) used by the laboratory. The analytical results and lookup value units must be identical for all data.
5. Based on the analytical units selected in D above, record the corresponding valid tracer concentration (10,000,000 $\mu\text{g}/\text{m}^3$, 4,000,000 ppbv, or 4,000 ppmv) in columns one through eight. Units for all columns must be identical.
6. Enter the analytical results.
7. Using the Tennessee Soil Gas Lookup Table, enter the depth for each sample and record the lookup value results for the applicable COCs in the appropriate row.
8. Print the TN Soil Gas Lookup Table for each depth entered. Attach a copy to the Soil Gas Sampling Report in Attachment 4 (Do not print the Data and Equations table).
9. Compare the analytical results to the corresponding lookup value. Highlight, shade, and/or bold any analytical result concentration(s) that are equal to or exceed the lookup value concentrations.
10. Enter the biological parameters laboratory results (%) for each sample location.
11. Enter the vacuum test field log data (in. of Hg) for each sample location.

Table 1 - Soil Gas Survey Analytical Results Table

Check applicable receptor & foundation:		Receptor: ☐ Commercial ☐ Residential Foundation: ☐ Slab-on-grade ☐ Basement/Crawlspace ☐ Basement/Slab							
COC parameter	Sample location	Analytical results/lookup values							
	Sample depth (feet)	1	2	3	4	5	6	7	8
	Units ($\mu\text{g}/\text{m}^3$, ppbv, ppmv)								
Benzene	Analytical Result								
	Lookup Value								
Toluene	Analytical Result								
	Lookup Value								
Ethylbenzene	Analytical Result								
	Lookup Value								
Xylenes	Analytical Result								
	Lookup Value								
MtBE	Analytical Result								
	Lookup Value								
Naphthalene	Analytical Result								
	Lookup Value								
Isopropanol	Analytical Result								
	Valid Conc.								
Biological parameters		Percent							
Oxygen									
Carbon Dioxide									
		Inches of Hg							
Sample train test vacuum									
2-min. vacuum test passed? (Y/N)									
Initial SUMMA® canister vacuum									
Final SUMMA® canister vacuum									

Soil Gas Survey Field Log

Facility name:

Facility ID:

Date of collection:

CAC project #:

Weather conditions:

Field log completed by:

1. CAC Personnel:

List the Corrective Action Contractor personnel and if applicable, subcontractor personnel that are onsite, their billing title(s), and total time at the site:

2. Purge volume calculations:

Tubing size (OD) (e.g. 1/8 inch, 1/4 inch, or 3/8 inch):

Show purge volume calculations. If both 3-foot and 10-foot depth probes are installed, show both calculations:

Total purge vol. per 3 ft probe: _____ mL; per 10 ft probe (if applicable): _____ mL

3. Complete the following table:**Table 1 – Field Log**

Parameter	Units	Value							
Boring #		1	2	3	4	5	6	7	8
Canister #									
Total purge volume	mL								
Vacuum test - initial	Inches Hg								
Vacuum test - final	Inches Hg								
Vacuum test - loss	Inches Hg								
Vacuum test start time	Military								
Vacuum test stop time	Military								
Total vacuum test time	Min/sec								
Initial SUMMA [®] vac	Inches Hg								
Sample start time	Military								
Sample stop time	Military								
Total sample time	Min/sec								
Final SUMMA [®] vac	Inches Hg								

4. Provide comments/additional information for each boring as needed:

**p. Mobile Enhanced Multi-Phase Extraction (MEME) Application
Template**



Division of Underground Storage Tanks

MOBILE ENHANCED MULTI-PHASE EXTRACTION (MEME) APPLICATION

THIS APPLICATION IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	<u>Included(Yes/No)</u>
All Information Listed Below and Completed Signature Page	_____
<u>Attachment 1</u>	
1. Site Map	_____
<u>Attachment 2</u>	
1. Potentiometric Table	_____
<u>Attachment 3</u>	
1. MEME Wellhead Configuration Diagram	_____
<u>Attachment 4</u>	
1. Pump Curve	_____
<u>Attachment 5</u>	
1. Cost Proposal	_____

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A. Facility and General Information	Page Number
B. Equipment and Calibration Information	
C. Field Procedures	
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Attachment 1 - Figures.....	
1. Site Map.....	
Attachment 2 - Tables	
1. Potentiometric Table	
Attachment 3 - MEME Wellhead Configuration Diagram	
Attachment 4 – Pump Curve	
Attachment 5 – Cost Proposal.....	

To complete the cost proposal for this application, open the MEME Cost Proposal Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

A. Facility and General Information

1. Date of Application:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Provide the name, address, phone number, and email for the Responsible Party.
6. Provide the name, phone number, and email of the CAC responsible for MEME event oversight.
7. Provide the MEME contractor name, phone number, and email.
8. List all personnel that will be at the site, their job title, and anticipated time at the site. The preferred personnel are CAS specialists for MEME oversight.
9. Provide the type of free product (e.g. gasoline, diesel, gasoline/diesel, kerosene, waste oil, other).
10. Provide the proposed date and duration of MEME event (e.g. 8-hour (MEME-OW) or 24-hour (MEME-CAT)).

B. Equipment and Calibration Information

1. Describe the equipment to be used during the event, including but not limited to, the type and horsepower of the vacuum pump, vacuum capacity of the pump (in inches of Hg), cubic feet per minute (cfm) capacity of the pump, and capacity of the liquid recovery tank in gallons.
2. Describe the disposal method for the extracted fluids.
3. For any event that is expected to exceed the capacity of the liquid recovery tank, state how the fluids will be managed and disposed of, including, but not limited to, applicable discharge permits, additional temporary storage tank, treatment with existing oil/water separator, etc.
4. Describe the instruments that will be used to measure stack velocities, vacuum readings, and vapor concentration levels.

5. Prior to use, confirm that each instrument listed meets the manufacturer's specifications for operation and accuracy, and that the instrument, where required, has been properly calibrated. Confirm that the pressure gauges for the vacuum readings are sized properly. Describe the details of the verifications and calibration for each instrument.

C. Field Procedures

1. List the well extraction order, connection configuration and proposed drop tube depth for each extraction well. Include any proposed drop tube adjustments to be completed during the event.
2. List the perimeter well(s) to be used for monitoring vacuum readings.
3. Describe the method for determining the vacuum radius of influence.

Signature Page**MEME APPLICATION**

A signature page, as shown below, shall be attached to the MEME Application. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

_____	_____	_____
(Print name & check all that apply)	Signature	Date
☐ Tank Owner		
☐ Tank Operator		
☐ Petroleum Site Owner		
☐ Authorized Representative		

Title (Print)

_____	_____	_____
PE, PG, or CAC (Print name)	Signature	Date

_____	_____
TN Registration #	CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines. Identify and label the extraction wells and wells to be monitored during the MEME event.

Attachment 2 – Tables

1. **Potentiometric Table** - Provide all water level data in the Potentiometric Table located in the MEME Workbook.

Attachment 3 - MEME Wellhead Configuration Diagram

Provide a diagram of all applicable fittings and downhole hose configurations, including but not limited to vacuum gauge(s) location(s), hosing specifications, air valve(s), coupling(s), cam lock(s), etc.

Attachment 4 – Pump Curve

Provide a graph depicting the Pump Curve of the proposed equipment to be utilized during the event. The Pump Curve shall be in accordance with the manufacturer's specifications.

Attachment 5 – Cost Proposal

Complete the applicable Cost Task Sheets located in the MEME Cost Proposal Workbook and provide a detailed breakdown on the estimated costs. Applicable tasks may include: 2.4.a, 2.4.b, 2.4.c (8-hour), 2.4.d (8-hour), 2.4.e (24-hour), 2.4.f, 2.4.g, 2.4.h, and/or 2.4.i (24-hour).

Three (3) vendor bids shall be included in the cost proposal. All cost proposals and vendor bids shall be in accordance with the reasonable rates established by the Division in the current FRG.

q. Mobile Enhanced Multi-Phase Extraction (MEME) Report Template



Division of Underground Storage Tanks

MOBILE ENHANCED MULTI-PHASE EXTRACTION (MEME) REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	<u>Included (Yes/No)</u>
All Information Listed Below and Completed Signature Page	_____
<u>Attachment 1</u>	
1. Site Map	_____
2. Potentiometric Maps	_____
3. Induced Vacuum Map	_____
<u>Attachment 2</u>	
1. Influent Analytical Results Table	_____
2. Potentiometric Table	_____
3. Free Product Removal Table	_____
<u>Attachment 3</u>	
1. Influent Laboratory Analytical Results	_____
<u>Attachment 4</u>	
1. MEME Field Logs	_____
<u>Attachment 5</u>	
1. Disposal Manifest(s)	_____
<u>Attachment 6</u>	
1. Copies of Permits (if applicable)	_____

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A. Facility and General Information	Page Number
B. MEME Event Information	
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1. Site Map.....	
2. Potentiometric Maps.....	
3. Induced Vacuum Map	
Attachment 2 - Tables	
1. Influent Analytical Results Table	
2. Potentiometric Table	
3. Free Product Removal Table.....	
Attachment 3 - Laboratory Analytical Reports.....	
1. Influent Laboratory Analytical Report.....	
Attachment 4 - MEME Field Logs	
Attachment 5 - Disposal Manifests.....	
Attachment 6 - Copies of Permits (if applicable).....	

To complete the tables in this report, open the MEME Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

A. Facility and General Information

1. Date of Report:
2. Facility ID Number:
3. Facility Name:
4. Facility Address:
5. Date of MEME event:
6. List the personnel on site, their job title and total time on site.

B. MEME Event Information

1. Provide the type of free product recovered during the MEME event.
2. Provide the following specific measurements from the event:
 - a) Gallons of free product in tank prior to beginning the MEME event.
 - b) Gallons of free product in tank at the end of the MEME event.
 - c) Gallons of water in tank at the end of the MEME event.
3. Provide a detailed summary of the MEME event that at a minimum, includes all relevant facts, observations and developments associated with the MEME event that occurred from the start of the event through the end of the event, a discussion of field operations, any actions taken to improve the extraction, any problems encountered during the MEME event, deviations from the work plan specified on the approved application, data inconsistencies, and any other significant procedural and/or analytical details.
4. List each instrument used during the MEME and confirm that they met the manufacturer's specifications for operation and accuracy. Confirm that the instruments were properly calibrated and list methods and dates of calibration. Confirm that the pressure gauges for the vacuum readings were sized properly.
5. Describe the effect of the vacuum at the site during the MEME event, including the radius of influence to 0.1 inches of water vacuum.
6. Describe the drawdown effects at the site during the MEME event, including a cone of depression, if noted.

7. Describe the occurrence of free product at the site after the MEME event.
8. If free product was not removed at a specific location listed in the Free Product Removal Table, explain why the product was not removed.
9. Describe the method and location of disposal for the recovered free product, liquids, soils, pads, booms, etc.

Signature Page**MEME REPORT**

A signature page, as shown below, shall be attached to the MEME Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

_____	_____	_____
(Print name & check all that apply)	Signature	Date
☐ Tank Owner		
☐ Tank Operator		
☐ Petroleum Site Owner		
☐ Authorized Representative		

Title (Print)

_____	_____	_____
PE, PG, or CAC (Print name)	Signature	Date

_____	_____
TN Registration #	CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines. Identify and label the extraction wells and wells to be monitored during the MEME event.
2. **Potentiometric Maps** – Provide two (2) scaled potentiometric maps derived from data collected before the MEME event and after the MEME event. Depict the interpreted direction of groundwater flow with an arrow(s). Maps are only required for a 24-hour MEME event. The maps shall contain all requirements from the site map.
3. **Induced Vacuum Map** – Provide a scaled plan view map documenting the vacuum effect (by using contour lines) during the MEME event. The map shall contain all requirements from the site map.

Attachment 2 – Tables

1. **Influent Analytical Results Table** – Provide all influent sample results to date in the Influent Analytical Results Table located in the MEME Workbook.
2. **Potentiometric Table** - Provide all water level data in the Potentiometric Table located in the MEME Workbook.
3. **Free Product Removal Table** - Provide all free product data in the Free Product Removal Table located in the MEME Workbook.

Attachment 3 - Laboratory Analytical Reports

Influent Laboratory Analytical Report - At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.

Attachment 4 – MEME Field Logs

Provide a copy of all original field documentation, including the MEME field logs completed during the event. Include any subcontractor field log and/or report, if applicable.

Attachment 5 – Disposal Manifest(s)

UST_G-01

Provide a copy of the disposal manifest(s) for the recovered fluids from the event.

Attachment 6 – Copies of Permit(s)

Provide a copy of all permits required for the event.

r. Corrective Action Plan (CAP) Template



Division of Underground Storage Tanks

CORRECTIVE ACTION PLAN

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page****Attachment 1**

1.	Site Map	_____
2.	Vicinity Map	_____
3.	Vapor Monitoring Map	_____
4.	Horizontal Extent of Soil Contamination Map(s)	_____
5.	Proposed Excavation Map (if applicable)	_____
6.	Excavation Cross Section Map (if applicable)	_____
7.	Horizontal Extent of Groundwater Contamination Map(s)	_____
8.	Horizontal Soil Radius of Influence Map (if applicable)	_____
9.	Horizontal Groundwater Radius of Influence Map	_____
10.	Extraction System Layout Map	_____
11.	Site Specific Wellhead Manifold and Extraction Well Vault Diagram	_____
12.	Site Specific CAS Inlet Piping Manifold Diagram	_____
13.	Site Specific Trench and Piping Diagram	_____

Attachment 2

1.	Applicable Cleanup Levels for COCs Table	_____
2.	Soil Analytical Results Table	_____
3.	Groundwater Analytical Results Table	_____
4.	Water Supply Well and/or Surface Water Analytical Results Table(if applicable)	_____

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- 5. Free Product Removal Table (if applicable) _____
- 6. Potentiometric Table _____
- 7. Vapor Monitoring Results Table _____
- 8. Schedule for Monitoring Reports and Tasks _____

Attachment 3

- 1. Boring Logs (soil and/or monitoring well construction logs, if applicable) _____

Attachment 4

- 1. Laboratory Analytical Reports (soil and/or water, if applicable) _____

Attachment 5

- 1. Corrective Action Plan Implementation Schedule _____

Attachment 6

- 1. Project Life Expectancy _____

Attachment 7

- 1. Summary of CAS recommendations _____

Attachment 8

- 1. Permit(s) _____

Attachment 9

- 1. CAS Figure Packages (e.g. figures, diagrams, layouts, etc.) _____

Attachment 10

- 1. CAS Operational Paperwork _____

Attachment 11

- 1. Non-Fund Covered Release Additional Requirements _____

Attachment 12

1. Tennessee General Contractors License

Attachment 13

1. Public Participation

Attachment 14

1. Field Documentation (if applicable)

Attachment 15

1. Cost Proposal

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To complete this report, open the CAS Workbook-Final.xlsx and Corrective Action Cost Proposal Workbook.xls Excel files. Include the applicable CAS Figure Package PDF (Air Lift CAS Figure Package.pdf, CAS Figure Package.pdf, Groundwater Pump CAS Figure Package.pdf, and TDEC 50 HP-OS-LRP Layout.pdf).

The CAS Deactivation Checklist-Final.xls Excel file is also included in the Attachments Panel of the Guidance Manual.

Click on the paperclip located on the sidebar panel and select the appropriate workbook.

Corrective Action Plan Cover Page

Date of CAP:

UST Facility ID Number:

UST Facility Name:

UST Facility Address:

Case Number:

Current or Last Business Name of Location:

Name of the tank owner and/or operator at the time of the release:

Name of the PAR for implementation of the CAP (This is the individual such as the tank owner, tank operator, property owner, or a specific representative of the business authorized to act on behalf of that business):

Name of the CAC company and individual(s) who prepared the CAP including applicable license/registration type and number:

A. Executive Summary

Provide an Executive Summary describing the progress of the project to date. Identify the source, type, and amount of petroleum released and the date the release was discovered. Include a brief discussion of all hazard management activities performed to date. Identify all impacts resulting from the release. Discuss the conclusions and interpretations of data derived from the environmental assessment and exposure assessment activities. Summarize all pertinent discussions and decisions made during the Pre-CAP meeting that impact the chosen corrective action technologies.

B. Proposed Corrective Action Technology (CAT) - Soil (Excavation and/or Soil Vapor Extraction)

Excavation shall be the preferred method for soil remediation, **unless the integrity of a structure would be compromised or other physical limitations will not allow excavation.**

1. Excavation

a) Excavation plan

Provide a detailed description of the excavation plan which includes the following:

- i. Estimated volume of soil to be excavated;
- ii. Method of excavation of soil;
- iii. Removal of piping, dispensers, canopy, etc., if applicable;
- iv. Site surface coverage (i.e. grass, gravel, concrete, asphalt, etc.);
- v. Disposal and/or treatment methods for all excavated material that will be screened and sampled in accordance with [section VI.B.3](#) Excavated Material Screening, Sampling, and Reporting;
- vi. Backfill material;
- vii. A Corrective Action Plan Implementation Schedule (CAPIS). Scheduling of these activities shall be planned and prepared in accordance with the CAPIS located in the "CAS Workbook". Provide the CAPIS in Attachment 5.
- viii. Any other pertinent information.

b) Sampling plan

Provide a sampling plan describing the field screening and sampling that will be conducted in accordance with the current Guidance Manual to verify the in-situ concentrations of the COCs after excavation (Additional soil removal beyond the approved CAP shall require written Division approval). The plan shall include the number, location and depth of the samples to be collected. Provide a scaled plan view site map depicting the sampling points in Attachment 1 (Proposed Excavation Map).

c) Self-initiated Soil Cleanup Measures

If applicable, then provide a detailed description of any self-initiated soil cleanup measures not previously approved by the Division.

2. Soil Vapor Extraction

Provide a detailed justification for utilizing soil vapor extraction wells for soil remediation. This shall, at a minimum, include a discussion as to why soil contamination is not proposed to be overexcavated.

A CAP proposing other soil remediation technologies other than excavation or soil vapor extraction shall not be completed and/or submitted without prior Division approval.

C. Proposed Corrective Action Technology (CAT) – Groundwater

1. Equipment Provided by the Division for Fund Covered Releases

Provide a statement indicating whether the release is Fund covered or not. If the release is not Fund covered, then Attachment 11 shall be completed.

a) Available CAS equipment

Available CAS equipment will be provided by the Division. Based on sizing criteria listed in [section VI.N](#) Corrective Action Plan of the Guidance Manual, provide a discussion on which CAS equipment is proposed to be selected for installation.

b) Standard CAS components

Based on the standard CAS components listed in [section VI.N](#) Corrective Action Plan of the Guidance Manual, Provide a discussion on any site-specific variances of equipment proposed.

2. Optional CAS Equipment

a) Free product

If free product is present, then provide a discussion of any additional equipment requirements (i.e. necessity for a 300 gallon free product tank).

b) Odor concerns

If occupied residences and/or active businesses are within close proximity of the proposed CAS location, then identify the type of structure(s). Provide a discussion of any additional equipment requirements (i.e. necessity for a catalytic oxidizer, etc.).

D. Parameters to Properly Size the CAS

Using all available MEME results data, provide the rationale to justify the size of the system based on air flow, vacuum, lithology, number of extraction wells, groundwater extraction rate per well and depth to water (i.e. if additional measures are required to lift the water such as air assist, etc.). Provide a detailed description including:

1. CAS Sizing Criteria

- a) Effective radius of influence
- b) Extraction rates - air and groundwater
- c) Provide the total MEME event extraction air flow volume (ACFM) and groundwater extraction rates (in gpm) required for the proposed system.
- d) Extraction well number and placement
- e) Provide the rationale used for the proposed number and placement of groundwater extraction wells.
- f) Provide any other pertinent CAS sizing criteria. This includes, but is not limited to, local ordinances, codes, and/or regulations that would influence the CAS sizing.
- g) Provide justification if more than one CAS is deemed necessary.

2. Extraction Well Layout

a) Soil Vapor Extraction Well Layout (if proposed) -

Provide the rationale used for the proposed extraction well layout (follow the CAS Figure Packages using the applicable "Wellhead Manifold and Well Vault" figure). Discuss total well depths, known soil contamination depths and locations, radius of influence, observed potentiometric fluctuations, lithology, sand pack, screened interval and screen slot size.

b) Groundwater Extraction Well Layout

Provide the rationale used for the proposed extraction well layout (follow the CAS Figure Packages using the applicable "Wellhead Manifold and Well Vault" figure). Discuss total well depths, observed potentiometric fluctuations, lithology, sand pack, screened interval and screen slot size.

- i. Recoverability determination (limit of vacuum lift); and
- ii. Provide the elevation difference in feet between the lowest groundwater elevation (potentiometric surface) and the CAS inlet manifold (refer to the CAS Figure Packages using the applicable "CAS Inlet Piping Manifold" figure). Based on this elevation difference, discuss if air assistance is necessary to improve groundwater extraction rates.

E. Permitting Requirements

1. Discharge and emissions

Provide a detailed description of the proposed effluent water discharge and air emissions methods including required permits. Describe why these proposed discharge methods are best suited to this site. If applicable, the Division shall be copied on air permit applications at the time of permit application submittal.

2. Applicable permits

Provide a detailed list of all applicable state and local permits (i.e. building, electrical, plumbing, etc.) for the CAS and the permitting agency involved. Obtain applicable state and local permits prior to construction, installation, and discharge. Indicate the anticipated amount of time needed to receive approved permits in the CAPIS located in the "CAS Workbook".

F. CAS Implementation Schedule and Project Life Expectancy

Provide a discussion of the Corrective Action Plan Implementation Schedule (CAPIS) corresponding with Attachment 5. Provide a summary of the Project Life Expectancy as determined by the calculations in Attachment 6.

G. CAS Site Preparation Requirements**1. Electric power supply**

Provide the local power utility's name, contact information, available voltage, phase (3-phase is preferred) and amperage at the release site. Describe the power connection process including scheduling. If only single phase is available, then a phase converter will be required.

2. Potable water needed to wet test the CAS

Provide a description of how potable water will be supplied and managed. 500 gallons of potable water will be needed to initially wet test the CAS.

3. Crane or forklift for CAS delivery

Provide a discussion of the proposed offloading equipment and justification for equipment selection. The CAC is responsible for securing a crane with a minimum lifting capacity of 10,000 pounds and a spreader bar, with a minimum spreader length of eight (8) to ten (10) feet, to offload the CAS from the delivery trailer. Alternatively, a forklift with a minimum lifting capacity of 10,000 pounds equipped with extended forks may be used to offload the CAS from the delivery trailer. If a forklift is proposed, justification shall be provided.

H. Extraction Wells and Piping Installation Requirements**1. Wellhead manifold, extraction well vault layout, and CAS pad construction**

Provide a discussion of the extraction well manifold, extraction well vault layout, and CAS pad construction, including if site-grading or earthwork is required for the CAS pad. Bollards shall be proposed around the CAS in high traffic areas.

2. Extraction well tubing

Provide the diameter of tubing that is proposed and how many feet of tubing are planned for each extraction well.

3. CAS inlet piping manifold layout

Provide a discussion of the CAS piping manifold layout.

4. Trench and piping layout

Provide a discussion of the trench and piping layout.

5. Excavated soil and/or soil cuttings management

Provide a discussion of how all excavated soil will be managed, and any sampling requirements for disposal. All excavated soil and/or construction debris shall be properly disposed of in accordance with all local, state and federal requirements.

I. Additional Information

If applicable, then provide a detailed description of any self-initiated groundwater cleanup measures not previously approved by the Division. Provide the results of any Division approved pilot projects. Describe how this will affect the proposed extraction system. If any self-initiated groundwater cleanup measures are currently in operation (e.g., free product removal, etc.), then explain how the implementation of the extraction system will enhance or alter the current system. If the system is currently in operation, then show the actual measured radius of influence.

Provide any additional information that may be pertinent to the CAS sizing, site preparation and installation not previously requested. If applicable, then provide the information in tables or maps.

J. Summary of CAS recommendations

Provide a summary of the CAS recommendations for this site, including CAS size, bollards, free product tank, catalytic oxidizer, etc.

K. Operation and Maintenance (O&M)

Provide a detailed discussion of the planned O&M requirements of the proposed CAS.

1. Start-up Activities and Schedule

- a) Provide a description and schedule of start-up system O&M for the proposed CAS. If necessary, then provide a stepped start-up rationale, which includes, but is not limited to, which extraction wells will be initially placed online, which

intervals along the well screen(s) will dual phase high vacuum extraction be conducted from (where the drop tube inlets will be initially placed) and the length of time for the stepped start-up process. The rationale shall take into consideration variables which include, but are not limited to, groundwater levels, anticipated extraction rates, number of extraction wells with free product, total volume of free product, CAS capabilities and effluent discharge restrictions.

- b) Provide a description of the start-up activities including system monitoring and adjustment activities and why they are required. The description shall include the number and type of personnel and equipment that are required to perform the installation and start-up activities, completion of all field logs and review of telemetry reports. If proposing anything outside standard startup procedures as outlined in the Guidance Manual, provide justification.
- c) Provide a description and schedule of routine system O&M for the proposed CAS. The description shall not include major repairs or extensive troubleshooting, which may be covered by the manufacturer. If site visits are scheduled for more than once per month, then provide justification for additional visits.

2. CAS Repairs and/or Maintenance

Provide a description and anticipated schedule of all CAS repairs and maintenance.

L. Types of Monitoring Events

Provide a discussion of the monitoring events that will be conducted during corrective action and provide a schedule for the events, including Corrective Action Baseline Monitoring Event, Corrective Action Comprehensive Monitoring Event, Corrective Action Monitoring Event, and Corrective Action Closure Monitoring Event.

1. Soil Monitoring and Sampling

Provide a monitoring and sampling plan discussing the type and frequency to be conducted. The plan shall include the numbers and locations (including depth) of the samples to be collected. A list of all applicable COCs that will be analyzed in accordance with the sampling plan shall be provided.

2. Groundwater Monitoring and Sampling

Provide a monitoring and sampling plan discussing the type and frequency to be conducted. The plan shall include the numbers and locations of the samples to be collected. A list of all applicable COCs that will be analyzed in accordance with the sampling plan shall be provided.

3. Free Product Monitoring

Provide a plan describing the frequency of monitoring to be conducted for free product, including obtaining and documenting free product level measurements during each routine O&M site visit, if any well has a history of free product, removal of free product and how it will be managed (introduced into the product compartment of the CAS oil/water separator or product storage tank, etc.) Provide a plan describing the frequency of monitoring to be conducted for free product, if applicable.

4. Drinking Water Supply Monitoring and Sampling

Provide a sampling plan describing the type and frequency of sampling to be conducted of all water supply receptors identified during the assessment activities and a list of all COCs that will be analyzed. The plan shall include the number and locations of the samples to be collected. These locations shall be depicted on a color topographic map.

If any receptor abatement measure (i.e. filtration system, GAC unit, etc.) is ongoing, then provide a discussion of the scheduled maintenance of the receptor abatement measure.

5. Surface Water Monitoring and Sampling

Provide a sampling plan describing the type and frequency of sampling to be conducted of surface water locations identified during the assessment activities and a list of all COCs that will be analyzed. The plan shall include the number and locations of the samples to be collected. A site map or color topographic map (whichever is more appropriate) shall be provided depicting the location where surface water samples will be collected.

If any receptor abatement measure (i.e. booms, pads, skimmer, etc.) is ongoing, then provide a discussion of the scheduled maintenance of the receptor abatement measure.

6. Vapor Monitoring and Sampling

Provide a sampling plan describing the type and frequency of monitoring events to be conducted of any vapor monitoring that will be performed. The plan shall include the number and locations of the samples to be collected. These locations shall be depicted on a map. The type of monitoring instrument, make and model number, and calibration procedure and frequency to be followed shall be provided.

If any receptor abatement measure (i.e. ventilation fan, etc.) is ongoing, then provide a discussion of the scheduled maintenance of the receptor abatement measure.

7. Land, Water Use, Receptor Monitoring and Sampling, and Well Assessment

Provide a plan describing the type and frequency of monitoring to be conducted of all changes in land, surface water, groundwater use, current receptors surrounding the site, and monitoring and recovery well assessment as described in the applicable sections of the current Guidance Manual.

M. CAS Monitoring and Sampling

1. Vacuum

Provide a monitoring plan for obtaining and documenting vacuum measurements during each routine O&M site visit. Describe the type and frequency of measurements to be collected. The plan shall include the number and locations of the measurements to be collected. Provide the type of monitoring instrument, make and model number, and calibration procedure and frequency, if applicable.

2. Emissions

Provide a sampling plan for obtaining and documenting emission measurements during each routine O&M site visit. Describe the type and frequency of sampling to be conducted of any emissions monitoring from the proposed CAS, if applicable. The plan shall include the number and locations of the samples to be collected. Provide the type of monitoring instrument, make and model number, and calibration procedure and frequency.

3. System influent sampling

Provide a sampling plan describing the type and frequency of sampling to be conducted from the proposed CAS. The plan shall include the number and locations of the samples to be collected, and a list of all COCs that will be analyzed.

4. System effluent sampling

Provide a sampling plan describing the type and frequency of sampling to be conducted from the proposed CAS. The plan shall include the number and locations of the samples to be collected and shall directly correspond with the discharge permit requirements for effluent sampling.

N. Permit Monitoring and Sampling

Provide a plan describing the type and frequency of monitoring to be conducted to meet permit requirements, if applicable. The frequency and sampling requirements for water discharge and/or air emission permits shall be performed according to the approved federal, state, and/or local government agency requirements.

O. Notification

1. Public Participation

Provide a description of the public notice chosen. Documentation of the public notice shall be included in Attachment 13.

2. Notification of Field Activities

Notice shall be given to the Division in accordance with Rule 0400-18-01-.06(1)(b)1., which states:

“Notice of Field Activities.

(i) Tank owners and/or operators shall notify the division at least one (1) working day in advance of any routine field activity. Routine field activities include, but are not limited to, placement of soil borings, construction of monitoring wells, sample collection events, field surveys, such as water use surveys or land use surveys, installation and/or start-up of treatment systems.

(ii) Tank owners and/or operators shall notify the division by no later than one (1) working day after any non-routine field activity, such as emergency response activities.”

Provide a statement of agreement that the Division will be notified of all field activities in accordance with this section.

3. Conditions that Warrant a Seventy-two (72) Hour Notification

The Division shall be notified within seventy-two (72) hours if one or more of the following occurs:

- i. An impact occurs or reoccurs to any receptor;

- ii. Changes in land, surface, and/or groundwater use are discovered that would require a re-evaluation of the RAR upon which the applicable SSCLs are based;
- iii. Free product is discovered and has not been previously identified during any other assessment activity;
- iv. Free product thickness increases above historic levels in any monitoring well;
- v. The CAS is down for seventy-two (72) consecutive hours.

Provide a statement of agreement that the Division will be notified of 72-hour notification situations.

4. Schedule for Monitoring Reports and Tasks

Provide a statement of agreement that all monitoring reports listed in [section VI.N](#) Corrective Action Plan of the Guidance Manual will be submitted in accordance with the "Schedule for Monitoring Reports and Tasks" located in the "CAS Workbook".

P. Performance Measures, Triggers and Contingency Actions

1. Performance Measures (PM) of Site Remediation, Triggers and Contingency Actions

Provide a list of PMs that, if accepted by the Division, will be used to evaluate the effectiveness of the proposed CAT and make determinations as to when modifications to and/or termination of the CAP would be appropriate. In describing the PM, be sure to specify the type of data to be gathered, the frequency or schedule for gathering data, and set a predicted trend line for comparison over time.

Some PMs may deal with receptor, land or groundwater use instead of physical measurements. In these cases, propose a method and frequency for evaluating changes that may affect the basis upon which the applicable SSCLs were set. For example, if a new building with a basement is built immediately adjacent to the site, then the risk shall be reevaluated to determine if the applicable SSCLs should be changed.

In addition to setting PMs, propose triggers and contingency actions that would occur if the proposed CAT did not perform as predicted. [Section VI.N](#) Corrective Action Plan of the Guidance Manual provides examples of how PMs with a trigger and a contingency should be constructed. Provide any other suggestions not

included in the Guidance Manual for Performance Measures, Triggers, and Contingency Actions.

2. CAS Performance Evaluation Meeting

A performance evaluation meeting may be held between the PAR, CAC, and Division personnel as deemed necessary by the Division. Topics for discussion shall include, at a minimum, the topics outlined in [section VI.N](#) Corrective Action Plan of the Guidance Manual.

Provide a statement of agreement that the PAR and/or CAC will attend all performance evaluation meetings if required by the Division.

3. Additional Information

Provide any additional information that may be pertinent to the corrective action not previously requested. If applicable, provide the information in tables or maps.

Q. Management of Investigative Derived Waste

Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil, water, and/or free product removed.

Signature Page**CORRECTIVE ACTION PLAN**

A signature page, as shown below, shall be attached to the Corrective Action Plan. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

We, the undersigned, certify under penalty of law, including but not limited to penalties for perjury, that we will abide by the CAP Guidelines as established by Rule 0400-18-01-.06(10)(a), the approved CAP, and that the information contained in this report and on any attachments, is true, accurate and complete to the best of our knowledge, information, and belief. We further agree to submit all remediation information in accordance with the reporting formats as provided in the CAP Guidelines. Additionally, we agree to attend any meeting as scheduled and required by the Division. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional misrepresentations

 (Print name & check all that apply)

 Signature

 Date

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

 Title (Print)

 PE, PG, or CAC (Print name)

 Signature

 Date

 TN Registration #

 CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

- 1. Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
- 2. Vicinity Map** – Provide a scaled map that depicts the locations of all streets, buildings, subsurface structures, utilities, drinking water wells (if observed), and surface water bodies within one-tenth (0.1) mile from the site. Label the locations of identified hazards, if applicable.
- 3. Vapor Monitoring Map-** Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g. basements, utility vaults, sewers, etc.) within 300 feet of known contamination above the applicable SSCL. Indicate the 300 foot line with a dashed line.
- 4. Horizontal Extent of Soil Contamination Map(s)** - Provide a separate, contoured, scaled plan view map showing the horizontal extent for each COC that exceeds the applicable SSCL based on the most current soil sampling event. Contour each map to the appropriate SSCL of the COC. Indicate the COC soil source width parallel to groundwater flow direction with an arrow that depicts that width in feet. The map(s) shall also contain all site map requirements.
- 5. Proposed Excavation Map (if applicable)** - Provide a scaled plan view site map depicting the layout of the proposed excavation zone, and all proposed soil sample locations. Proposed excavation depth(s) shall be depicted, and former tank systems shall be indicated with a dashed line.
- 6. Excavation Cross Section Maps (if applicable)** - Provide a scaled cross section map representing cross section lines A-A' and B-B' respectively and showing the extent of the excavation zone overlaid on a depiction of the vertical extent of the contaminant plume(s) for free product and/or each of the applicable SSCLs. Separate maps shall be submitted for cross section line A-A' and B-B'.
- 7. Horizontal Extent of Groundwater Contamination Map(s)** - Provide a separate, plan view scaled site map showing the horizontal extent and most recent concentration for each COC that exceeds the applicable SSCL **in more than one well**. Contour each map to the appropriate SSCL of the

COC. The horizontal extent and thickness (in feet) of any free product shall be depicted on each map. Indicate the COC groundwater source width perpendicular to groundwater flow direction with an arrow that depicts this distance in feet. The map(s) shall also contain all site map requirements. If multiple aquifers have been impacted, then provide a separate plan view map for each aquifer.

- 8. Horizontal Soil Radius of Influence Map (if applicable)** - Provide a scaled plan view map depicting the soil radius of influence of the proposed extraction system. The scaled plan view map shall illustrate the vacuum influence to 0.1 inches of water overlaid on maps of the horizontal extent of soil contamination for any COCs exceeding the applicable SSCL.
- 9. Horizontal Groundwater Radius of Influence Map** - Provide a scaled plan view map depicting the groundwater radius of influence of the proposed extraction system that includes the locations of all existing and proposed monitoring and recovery wells. The scaled plan view map shall illustrate the predicted groundwater drawdown to a depth of one (1) foot and vacuum influence to 0.1 inches of water, overlaid on maps of the horizontal extent of free product and/or contaminant plumes for any COCs exceeding the applicable SSCL.
- 10. Extraction System Layout Map** - Provide a scaled plan view site map depicting the location of the CAS and layout of the extraction system. The map shall include, but not be limited to the concrete pad, power supply, CAS, piping trenches, CAS inlet piping manifold, extraction wells, and well vaults. The map shall also include existing underground obstructions, soil borings and monitoring wells, etc. Indicate the distance from the CAS to the nearest occupied residence and commercial building.
- 11. Site Specific Wellhead Manifold and Extraction Well Vault Diagram** - Provide a site-specific diagram of the extraction well manifold and extraction well vault layout. Unless otherwise approved by the Division, all extraction well manifolds and extraction well vaults shall be constructed using the dimensions and materials specified located in the CAS Figure Packages using the applicable "Wellhead Manifold and Well Vault" figure. All extraction wellheads shall be properly sealed to maintain the designed vacuum and shall be enclosed within the extraction well vault. The metal vault shall be able to withstand traffic consistent with the type of facility and shall be secured with a lock or bolt down mechanism.
- 12. Site Specific CAS Inlet Piping Manifold Diagram** - Provide a site-specific diagram of the CAS piping manifold layout. The CAS inlet piping manifold is

to be installed outside the CAS concrete pad. The manifold shall be connected to the CAS using 4-inch PVC piping, unless otherwise required by local code. Unless otherwise approved by the Division, the CAS piping manifold shall be constructed in accordance with the dimensions and construction materials specified in the piping manifold layout located in the CAS Figure Packages using the applicable "CAS Inlet Piping Manifold" figure.

- 13. Site Specific Trench and Piping Diagram** - Provide a site-specific scaled plan view site map and scaled cross-section of the extraction and contingent piping trench. Unless otherwise approved by the Division, all piping trenches shall be installed in accordance with the dimensions and construction materials specified in the CAS Figure Packages, using the applicable "Wellhead Manifold and Well Vault" figure. All recovery and contingent piping shall be a minimum of two (2) inches in diameter. All trenches installed for extraction piping shall include a single truncated contingent piping into each extraction well vault. If simple vacuum extraction is not sufficient based on MEME data (i.e. elevation difference between inlet pipe for CAS and groundwater is greater than forty (40) feet), then a minimum three quarter (3/4) inch air assist line shall be included within the piping trenches to each extraction well.

Attachment 2 – Tables

- 1. Applicable Cleanup Levels for COCs Table** – Provide the applicable cleanup levels and maximum concentrations from the most current sampling event for soil and groundwater in the Applicable Cleanup Levels for Chemicals of Concern (COC) Table located in the CAS Workbook. Identify which COCs have exceeded the cleanup levels by shading the appropriate box.
- 2. Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the CAS Workbook.
- 3. Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the CAS Workbook.
- 4. Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the CAS Workbook.

5. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the CAS Workbook.
6. **Potentiometric Table** – Provide all water level data in the Potentiometric Table located in the CAS Workbook.
7. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the CAS Workbook.
8. **Schedule for Monitoring Reports and Tasks** – Provide a site-specific schedule for monitoring reports and tasks in the Schedule for Monitoring Reports and Tasks Table located in the CAS Workbook.

Attachment 3 – Boring Logs

Provide all detailed boring logs and well construction logs **(not previously submitted)** completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 4 - Laboratory Analytical Results

All Laboratory Reports **not previously submitted** shall be included in this attachment (segregated by sampling event and in chronological order).

1. **Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
2. **Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
3. **Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 5 – Corrective Action Plan Implementation Schedule (CAPIS)

Provide a CAPIS for the CAS installation activities that are planned. This schedule shall be site specific and prepared in accordance with the CAPIS, located in the CAS Workbook.

Attachment 6 – Project Life Expectancy

Provide the calculated life expectancy of the project up through case closure. The length of time required to reduce current groundwater COC concentrations to below the approved SSCLs shall be calculated utilizing industry accepted models. Known site specific data such as plume size and MEME event derived well extraction rates shall be utilized in these models. Unknown data such as porosities and fractional organic carbon shall be derived from reference tables located in the applicable file as noted on the Table of Contents page of this report template. The life expectancy of the project includes the length of time to reduce groundwater COC concentrations below the applicable cleanup levels and the length of time to complete closure monitoring with the CAS offline. The calculated life expectancy shall be used to develop an accurate cost proposal and may also be used to develop performance measures. A cost proposal is not required for state or federal owned release sites.

Attachment 7 – Summary of CAS recommendations

Complete the following table. Attachment 7 shall be submitted on one designated page.

Summary of CAS Recommendations	
Average depth to groundwater (ft):	
Average depth of extraction wells (ft):	
Measured drawdown during most recent MEME event (ft):	
Vacuum radius of influence during the most recent MEME event (ft):	
Distance from the CAS to closest residence (ft):	
Number of proposed extraction wells:	
Number of proposed extraction wells with free product:	
capillary fringe soil type (e.g. karst, sand, clay, silt):	
effluent discharge type (e.g. NPDES, POTW, reinjection):	
Required electrical voltage (e.g. 120/208, 120/240 recommended):	

Required phase (e.g. single phase, three phase):	
Requested CAS OS-LRP Package (e.g. 25 HP OS-LRP, 30- HP OS-LRP, 40 HP OS-LRP, 50 OS-LRP):	
Is XP equipment required? (city of Memphis only):	
Requested optional equipment (e.g. free product tank, cat-ox):	

Attachment 8 – Permit(s)

Provide a copy of all permits required for CAP implementation.

Attachment 9 - CAS Figure Packages (e.g. figures, diagrams, layouts, etc.).

Provide a copy of all CAS figure packages, diagrams, and layouts from the CAS manufacturer.

Attachment 10 – CAS Operational Paperwork

Provide a copy of all CAS operational field logs required to be maintained and completed in accordance with [section VI.N](#) Corrective Action Plan of the Guidance Manual. Log templates shall contain site specific information in the applicable portions.

Attachment 11 - Non-Fund Covered Release Additional Requirements

If the release is determined to not be fund covered, complete the following attachment.

Excavation and dual phase high vacuum extraction are the preferred technologies. However, other CATs may be proposed for non-Fund covered releases. In addition to the information listed in the previous sections, if the Division has determined the release to be non-Fund covered, then provide the following information in the CAP.

1. Capital Equipment

The minimum operational component specifications for a dual phase high vacuum extraction and groundwater treatment system shall include the following. If any component listed below is excluded from the CAP, then justification shall be provided:

- a) Vacuum pump capable of extracting total fluids and air with a minimum of twenty (20) inches of mercury vacuum capacity and a minimum air flow rate of 200 ACFM;
- b) Air/water separator capable of handling the anticipated maximum flow;
- c) Oil/water separator capable of handling the anticipated maximum flow;
- d) Air stripper capable of handling the anticipated maximum flow;
- e) Intra-system transfer pumps with a minimum capacity as needed to transfer extracted fluids between major system components;
- f) Interconnected piping and material of construction including all fittings and cleanouts. Include sampling ports, unions and valves. For explosion proof systems, include local requirement provision for above ground carbon steel piping and fittings;
- g) National Electric Manufacturers' Association (NEMA) 4 intrinsically safe master control panel;
- h) Digital telemetry system with eight (8) inputs and expansion capacity. Battery backup with remote restart and shutdown capability shall be included. Provide a description of all programmed alarm codes and settings;
- i) System building including, but not limited to, fire extinguisher, ventilation, explosion proof (XP) interior light and intrinsically safe switches;
- j) Two (2) bag filter units in parallel with integrated bypass piping;
- k) Two (2) granular activated carbon canister assemblies in series with integrated bypass piping;
- l) Mechanical totalizing flow meter;
- m) Discharge transfer pump with a flow capable of handling the anticipated maximum discharge;

- n) Any additional equipment necessary to address free product;
- o) Any additional equipment necessary to address noise and/or odor concerns; and
- p) Other equipment not requested above.

2. Capital Costs

Provide a discussion of the capital costs. Prepackaged systems should not be broken into individual components. Include capital equipment costs in the applicable worksheets located in the "Corrective Action Cost Proposal Workbook". A cost proposal is not required for state or federal owned release sites.

3. Winterization for the CAS

Provide a discussion of the steps that will be taken to address winterization issues.

4. Iron Sequestering Process for the CAS

Provide a discussion of the steps that will be taken to address iron sequestering issues.

5. Process Flow Diagram Including all Components of the Proposed CAS

Provide a process flow diagram.

6. CAS Compound Layout Diagram

Provide a compound layout diagram.

7. Equipment Brochures and Manufacturers' Design Specifications

Provide all equipment brochures and manufacturers' design specifications.

8. Additional Information

Provide any other pertinent information.

Attachment 12 – Tennessee General Contractors License

A Tennessee General Contractors License is required for any CAC to perform construction activities in accordance with Rule 0400-18-01-.09(15)(b)2.(xi). Provide a copy of the Tennessee General Contractors License of the company/individual installing the CAS.

Attachment 13 – Public Participation

Provide documentation of the public notice published as part of the CAP.

Attachment 14 – Field Documentation

If applicable, provide a copy of all original field documentation **not previously submitted** including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 15 – Cost Proposal

Complete the applicable worksheets located in the “Corrective Action Cost Proposal Workbook” and provide a detailed breakdown of the estimated costs for each proposed CAT. All cost proposals and vendor bids shall represent current market prices. A cost proposal is not required for state or federal owned release sites. All cost proposals for Fund covered releases shall be in accordance with the reasonable rates established by the Division in [Appendix 2](#) FRG of the Guidance Manual.

s. Corrective Action Monitoring Report (CAMR) Template



Division of Underground Storage Tanks

CORRECTIVE ACTION MONITORING REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:**Included(Yes/No)****All Information Listed Below and Completed Signature Page****Attachment 1**

1.	Site Map	_____
2.	Receptor Map	_____
3.	Horizontal Extent of Soil Contamination Map(s)	_____
4.	Horizontal Extent of Groundwater Contamination Map(s)	_____
5.	Radius of Influence Map	_____
6.	Potentiometric Maps	_____
7.	Vapor Monitoring Map	_____
8.	"As-built" Diagrams (if applicable)	_____
9.	Surveyor Map (if applicable)	_____

Attachment 2

1.	COC Concentration & Water Level vs. Time Graph (if applicable)	_____

Attachment 3

1.	Applicable Cleanup Levels for COCs Table	_____
2.	Soil Analytical Results Table	_____
3.	Groundwater Analytical Results Table	_____
4.	Water Supply Well and/or Surface Water Analytical Results Table (if applicable)	_____
5.	Influent/Effluent Analytical Results Table	_____
6.	Potentiometric Table	_____

7. Free Product Removal Table (if applicable) _____
8. Vapor Monitoring Results Table _____
9. Schedule for Monitoring Reports and Tasks _____
10. Well Condition Table (if applicable) _____

Attachment 4

1. Boring Logs (soil and/or monitoring well construction logs, if applicable) _____

Attachment 5

1. Laboratory Analytical Reports (soil and/or water, if applicable) _____

Attachment 6

1. CAS Monthly Runtime Table _____
2. CAS Air Emissions Monitoring Table _____
3. CAS Performance Data Table _____
4. Extraction Well Performance Data Table _____
5. Vacuum Monitoring Results Table _____
6. System Status & Inspection Table _____
7. Telemetry Documentation _____
8. CASFLs, CASRLs and/or CASDRs _____

Attachment 7

1. Field Documentation _____

Attachment 8

1. Startup Checklists (if applicable) _____

Attachment 9

1. Discharge and/or emission permit(s) copies (if applicable) _____

Attachment 10

1. Updated Water Use Survey Sheets (if applicable) _____

Attachment 11

1. Updated Vapor Hazard Documentation (if applicable) _____

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Attachment 4 - Boring Logs (if applicable)	
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To complete the tables in this report, open the CAS Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

Corrective Action Monitoring Report Cover Page

Date of CAMR:

Type of Monitoring Report (e.g. Corrective Action Baseline Monitoring Report (CABMR) Corrective Action Monitoring Report – with as-built diagrams (CAMR-ab) Corrective Action Monitoring Report (CAMR), or Corrective Action Closure Monitoring Report (CACMR):

Dates of Monitoring Period (from/to):

UST Facility Identification Number:

UST Facility Name:

UST Facility Address:

Case Number:

Name of the PAR for implementation of the CAP (This is the individual such as the tank owner, tank operator, property owner, or a specific representative of the business authorized to act on behalf of that business):

Name of the CAC company and individual(s) who prepared the CAMR including applicable license/registration type and number:

A. Monitoring Progress, Problems, and Results

Provide the most current information in accordance with the requirements set forth below:

1. System Installation or Modification Information

Provide a description of CAS installation or modification activities.

2. Site Remediation Progress

Provide a summary of remediation progress including, but not limited to, changes to receptors, analytical results changes and trends, free product location and thickness trends, CAS performance trends, etc.

3. CAS progress

Provide the progress and effectiveness of the CAS since the last report. Information in the report shall include, but not be limited to, a discussion of the following:

- a) CAS performance relative to the performance measures (PMs) established in the approved CAP;
- b) CAS adjustments affecting performance. This includes, but is not limited to, drop tube adjustments and changes in the number and designation of extraction wells online and/or offline;
- c) CAS runtime (% uptime);
- d) For DPVE systems, air stripper efficiency (%);
- e) Contaminant removal efficiency (%);
 - i. Free product extraction [current thickness versus thickness at the time of installation (%)], if applicable;
 - ii. Groundwater concentration reduction [current concentration (ppm) versus concentration at the time of installation (% reduction)], if applicable; and,
 - iii. Soil concentration reduction [current concentration (ppm) versus concentration at the time of installation (% reduction)], if applicable; and,

- iv. CAS effluent evaluation with applicable permit requirements and to determine the continued use of GAC and bag filter components.

4. Additional information

Provide any additional information that was not included in the approved CAP or required by the Division. If applicable, then provide this additional information in tables and/or maps.

B. Problems

Provide a detailed summary of any problems that have been encountered since the previous report, actions taken to resolve the problems, and any complaints received or reported impacts from the release. If the CAS was non-operational when the CAC left the site for the day, then a detailed description shall be provided. If the CAS has been non-operational or down for extended periods of time greater than seventy-two (72) consecutive hours, then detailed documentation and an explanation for the delay shall be provided.

If the CAS is operating for less than 85% of the reporting period, then detailed documentation of the reason for the downtime and efforts to reactivate the CAS shall be submitted.

C. Results

1. Soil Results

Provide a summary of all soil boring results to date including, but not limited to, soil source investigation, closure, overexcavation, site check, other initial abatement activities, phase II, etc. Document all changes and trends based on the results. If applicable, provide a detailed summary discussing any new soil investigation activities that occurred during this monitoring period. If soil sampling was not required for this monitoring period, then, if applicable, provide a recommendation for the next soil sampling event.

2. Water Results

Provide a detailed discussion of all water sampling activities (e.g., drinking water and/or surface water impact, the occurrence of free product, etc.) that have occurred at this site. At a minimum, a comparison shall be made between the baseline water sampling event and the most recent water sampling event. Document all changes and trends based on the results. Provide a detailed

summary discussing any new groundwater investigation activities that occurred during this monitoring period.

3. Free Product Data

Provide a detailed discussion of all free product occurrences and recovery activities. At a minimum, provide the location(s) and thickness(es) of free product detected during this monitoring event as compared to historical location(s) and thickness(es). Document all changes and trends based on the results. Provide a detailed summary discussing any new free product investigation activities that occurred during this monitoring period.

4. Potentiometric Data

Provide a detailed discussion of the groundwater measurements from the current monitoring period. Provide a summary of all gauging events to date, including changes and trends. Provide a comparison of current measurements to historical measurements (i.e. depth to water is shallower or deeper than historically, rain events occurrences, seasonal fluctuations, etc.).

5. Vapor Monitoring Results

Provide a detailed discussion of all vapor monitoring of above ground and/or subsurface structures (i.e., basements, utility vaults, sewers, etc.) that have been previously impacted by petroleum vapors. If new vapor impacts were identified, provide documentation that it was handled in accordance with [section VI.D.2](#) Vapor Hazards of the Guidance Manual. Any new petroleum vapor impacts shall be discussed. Document all changes and trends based on the results.

6. Vacuum Monitoring Data

Provide a detailed discussion of current vacuum measurements collected during this monitoring period, including the radius of influence of the CAS. Provide a comparison of current measurements to historical measurements. If any well(s) had historical readings but did not this event, please elaborate as to the reasoning and what adjustments were made to resolve the issue. **Vacuum shall be measured while the CAS is operating.**

7. CAS Performance and Supporting Data

Provide a detailed summary of CAS performance trends from this monitoring period, including but not limited to the results from CAS Monthly Runtime Table, CAS Air Emissions Monitoring Table, CAS Performance Data Table,

Extraction Well Performance Data Table, and System Status & Inspection Table. Provide a comparison of current data to historical data, including justification/clarification for variances or deviations from typical operating parameters.

8. Receptor Monitoring

Provide a discussion of the results from the most recent receptor monitoring event. Provide a plan describing the type and frequency of monitoring to be conducted of all changes in land, surface water, groundwater use, current receptors surrounding the site, and well assessment as determined in the applicable sections of the current Guidance Manual. Provide a recommendation of when the next receptor monitoring event should be completed.

D. Additional Information and Recommendations

Provide a discussion of any additional information and/or recommendations concerning the site remediation activities.

E. Management of Investigative Derived Waste

Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil, water and/or free product removed during this monitoring event. Provide the current total number of drums on site, and the contents of each.

Signature Page**CORRECTIVE ACTION MONITORING REPORT**

A signature page, as shown below, shall be attached to the Corrective Action Monitoring Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable, a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

We, the undersigned, certify under penalty of law, including but not limited to penalties for perjury, that we will abide by the CAP Guidelines as established by Rule 0400-18-01-.06(10)(a), the approved CAP, and that the information contained in this report and on any attachments, is true, accurate and complete to the best of our knowledge, information, and belief. We further agree to submit all remediation information in accordance with the reporting formats as provided in the CAP Guidelines. Additionally, we agree to attend any meeting as scheduled and required by the Division. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional misrepresentations

 (Print name & check all that apply)
☐ Tank Owner
☐ Tank Operator
☐ Petroleum Site Owner
☐ Authorized Representative

 Signature

 Date

 Title (Print)

 PE, PG, or CAC (Print name)

 Signature

 Date

 TN Registration #

 CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

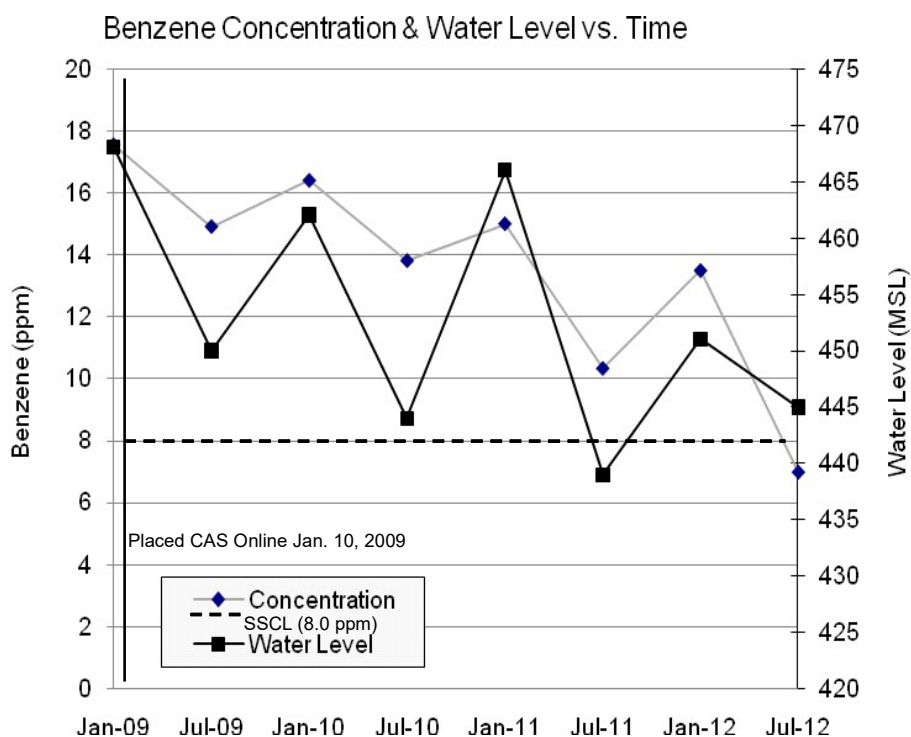
1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
2. **Receptor Map** - Provide a scaled receptor map of the area from the most current receptor survey depicting the nearest current residential and commercial off-site receptors for each applicable pathway. Draw an arrow to each receptor from the monitoring well with the highest benzene concentration and depict the distance to each receptor in feet. Identify the nearest drinking water receptors by identification number from the water use survey sheets.
3. **Horizontal Extent of Soil Contamination Map(s)** - Provide a separate, contoured, scaled plan view map showing the horizontal extent for each COC that exceeds the applicable SSCL based on the most current soil sampling event. Contour each map to the appropriate SSCL of the COC. Indicate the COC soil source width parallel to groundwater flow direction with an arrow that depicts that width in feet. The map(s) shall also contain all site map requirements.
4. **Horizontal Extent of Groundwater Contamination Map(s)**- Provide a separate, plan view scaled site map showing the horizontal extent and most recent concentration for each COC that exceeds the applicable SSCL **in more than one well**. Contour each map to the appropriate SSCL of the COC. The horizontal extent and thickness (in feet) of any free product shall be depicted on each map. Indicate the COC groundwater source width perpendicular to groundwater flow direction with an arrow that depicts this distance in feet. The map(s) shall also contain all site map requirements. If multiple aquifers have been impacted, then provide a separate plan view map for each aquifer.
5. **Radius of Influence Map** - Provide a scaled site map depicting measured vacuum influence from the most recent data collected during groundwater sampling. The map shall depict the vacuum influence to 0.1 inches of water measured at each extraction and monitoring well. If sufficient data is available, then contour vacuum influence.
6. **Potentiometric Maps** - Provide two (2) scaled site maps that include potentiometric data collected during the current and previous monitoring events. If multiple aquifers were investigated and sufficient data is generated, include potentiometric maps for each aquifer. Contour the potentiometric

data on each map and include arrows depicting the interpreted direction(s) of groundwater flow. Record all measurements to 0.01 feet including the depth of the well. If free product is present, depict the horizontal extent on the potentiometric map(s).

7. **Vapor Monitoring Map** - Provide a scaled site map depicting and labeling the locations of the vapor monitoring points of all subsurface structures (e.g. basements, utility vaults, sewers, etc.) within 300 feet of known contamination above the applicable SSCL. Indicate the 300-foot line with a dashed line.
8. **"As-built" Diagrams (only applicable as part of the CAMR-ab)** – Provide "As built" equipment and site diagrams for each CAT. The "as built" diagrams shall include at a minimum: a process and flow diagram, a site map including the extraction wells, CAS trenches, monitoring wells or extraction points, and system compound layout. If "as built" diagrams are provided in other types of reports (i.e., reports subsequent to the Corrective Action Baseline Monitoring Report that do not follow a major modification, etc.) then the cost of those diagrams may not be reimbursed from the Fund.
9. **Surveyor Map (if applicable)** – If not previously submitted for all current wells on site, provide the Tennessee Licensed Surveyor's Map generated from the Professional Survey. This map shall depict the distances and angles (relative to magnetic north) from the source well to the established and documented point on the top of each well casing.

Attachment 2 – Graphs

1. **COC Concentration & Water Level vs. Time** - Provide a graph for each well sampled during the monitoring event showing groundwater contaminant concentrations for all applicable COCs detected above the applicable SSCLs and groundwater levels versus time. A dashed line shall indicate the applicable cleanup level for SSCLs. Only one COC shall be shown on any one graph. All groundwater data shall be used and the point in time when the CAS became operational shall be indicated. Graphs shall indicate the information as shown in the example below.



Attachment 3 – Tables

1. **Applicable Cleanup Levels for COCs Table** – Provide the applicable cleanup levels and maximum concentrations from the last comprehensive sampling event for soil and groundwater in the Applicable Cleanup Levels for Chemicals of Concern (COC) Table located in the CAS Workbook. Identify which COCs have exceeded the cleanup levels by shading the appropriate box.
2. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the CAS Workbook.
3. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the Groundwater Analytical Results Table located in the CAS Workbook.
4. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the CAS Workbook.
5. **Influent/Effluent Analytical Results Table** – Provide all influent/effluent data in the Influent/Effluent Analytical Results Table located in the CAS Workbook.

6. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the CAS Workbook.
7. **Potentiometric Table** – Provide all water level data in the Potentiometric Table located in the CAS Workbook.
8. **Vapor Monitoring Results Table** – Provide all vapor monitoring data in the Vapor Monitoring Results Table located in the CAS Workbook.
9. **Schedule for Monitoring Reports and Tasks** – Provide the Schedule for Monitoring Reports and Tasks Table located in the CAS Workbook completed in accordance with the approved CAP.
10. **Well Condition Table (if applicable)** - Provide the completed Well Condition Table located in the CAS Workbook. Include photographic documentation of each well as specified on the Table.

Attachment 4 – Boring Logs

Provide all detailed boring logs and well construction logs (**not previously submitted**) completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 5 – Laboratory Analytical Reports

Laboratory Reports from this monitoring period shall be submitted (segregated by sampling event and in chronological order).

1. **Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
2. **Groundwater Laboratory Analytical Report** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
3. **Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

4. **Influent/Effluent Laboratory Analytical Report(s)**- At a minimum, all laboratory analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 6 – CAS Operational Documentation

1. **CAS Monthly Runtime Table** – Provide all required information on the Corrective Action System Monthly Runtime Table located in the CAS Workbook.
2. **CAS Air Emissions Monitoring Table** – Provide all required information on the Corrective Action System Air Emissions Monitoring Table located in the CAS Workbook.
3. **CAS Performance Data Table** – Provide all required information on the CAS Performance Data Table located in the CAS Workbook.
4. **Extraction Well Performance Table** – Provide all required information on the Extraction Well Performance Data Table located in the CAS Workbook.
5. **Induced Vacuum Monitoring Results Table**- Provide all required information on the Vacuum Monitoring Results Table located in the CAS Workbook.
6. **System Status & Inspection Table**- Provide all required information on the System Status & Inspection Table located in the CAS Workbook.
7. **Telemetry Documentation**- Provide first and last telemetry facsimile daily report for the monitoring period and any alarm facsimile received during the monitoring period (including an alarm code key).
8. **CASFLs, CASRLs, and/or CASDRs** – Provide all completed field logs, repair logs (if applicable) and down reports (if applicable) in chronological order for this monitoring period. All field logs and reports are located in the CAS Workbook.

Attachment 7 – Field Documentation

Provide a copy of all original field documentation **not previously submitted** including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 8 – Startup Checklists (only applicable as part of the CAMR-ab)

Provide the Corrective Action System Installation/Activation Checklist (CASIACL) completed during CAS startup (located in the CAS Workbook) and the completed CAS manufacturer's field start-up checklist completed prior to startup activities. The CASIACL and CAS manufacturer's field start-up checklist shall only be submitted as part of the CAMR-ab Report.

Attachment 9 – Discharge and/or emission permit(s) copies (only applicable as part of the CAMR-ab)

Provide a copy of all discharge and/or emission permits. Permits shall only be submitted as part of the CAMR-ab Report.

Attachment 10 – Updated Water Use Survey Sheets (if applicable)

Provide any new Water Use and Receptor Survey Sheets located in [Appendix 1.d](#) completed as part of the Receptor Survey.

Attachment 11 – Updated Vapor Hazard (if applicable)

Provide any documentation required due to a new vapor hazard identified during site activities.

t. Additional Monitoring Well Installation Template



Division of Underground Storage Tanks

Additional Monitoring Well Installation Report

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

	<u>Included (Yes/No)</u>
All Information Listed Below and Completed Signature Page	_____
<u>Attachment 1</u>	
1. Site Map	_____
2. Surveyor Map	_____
<u>Attachment 2</u>	
1. Soil Analytical Results Table	_____
<u>Attachment 3</u>	
1. Boring Logs (soil and/or monitoring well construction logs)	_____

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C. Installation Procedures.....	
D. Soil Sampling Procedures	
E. Management of Investigative Derived Waste.....	
Signature Page	
Attachment 1 – Figures	
1. Site Map.....	
2. Surveyor Map.....	
Attachment 2 – Tables	
1. Soil Analytical Results Table.....	
Attachment 3 – Boring Logs	

To complete the tables in this report, open the Monitoring Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

A. Executive Summary

Provide a summary that, at a minimum, describes the findings of the project to date, discusses all conclusions and interpretations of data derived from implementing the environmental assessment activities, and identifies all impacts resulting from the release.

B. Well Locations

Provide a discussion of the rationale for the location of each well installed, including any adjustments required during installation.

C. Installation Procedures

Provide a discussion of the well installation procedures, including any deviations from current guidelines, or any problems encountered.

D. Soil Sampling Procedures

Provide a discussion of the soil sampling procedures, including any deviations from current guidelines, or any problems encountered.

E. Management of Investigative Derived Waste

1. Provide information concerning the amount and management (storage, treatment, and/or disposal) of soil removed.
2. Provide information concerning the amount and management (storage, treatment, and/or disposal) of water removed.
3. Provide information concerning the amount and management (storage, treatment, and/or disposal) of free product removed.

Signature Page ADDITIONAL MONITORING WELL INSTALLATION REPORT

A signature page, as shown below, shall be attached to the Additional Monitoring Well Installation Report. The page shall be signed by the Tank Owner, Tank Operator, the Owner's/Operator's Authorized Representative, or Petroleum Site Owner, and, if applicable a Tennessee licensed professional geologist (P.G.) under the Tennessee Geologist Licensure Act of 2007 (T.C.A. §62-36-101 et seq.) or a Tennessee licensed professional engineer (P.E.) under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law (T.C.A. §62-2-101 et seq.).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

_____	_____	_____
(Print name & check all that apply)	Signature	Date
☐ Tank Owner		
☐ Tank Operator		
☐ Petroleum Site Owner		
☐ Authorized Representative		

Title (Print)

_____	_____	_____
PE, PG, or CAC (Print name)	Signature	Date

_____	_____
TN Registration #	CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

1. **Site Map** - Provide a scaled site map depicting the location of tank(s), product and vent line(s), dispenser(s), buildings, property boundary, right-of-way easements, building setbacks, subsurface structures, underground utilities, overhead utilities, closure sampling locations (if applicable), soil borings, and monitoring wells. Indicate former tank systems with dashed lines.
2. **Surveyor Map** – Provide the updated Tennessee Licensed Surveyor’s Map generated from the Professional Survey. This map shall depict the distances and angles (relative to magnetic north) from the source well to the established and documented point on the top of each well casing.

Attachment 2 – Tables

1. **Soil Analytical Results Table** - Provide all field screening and soil analytical results in the Soil Analytical Results Table located in the Monitoring Workbook.

Attachment 3 – Boring Logs

Provide all detailed boring logs and monitoring well construction logs (**not previously submitted**) completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

u. Permanent Closure Application (PCA) Template



Division of Underground Storage Tanks

PERMANENT CLOSURE APPLICATION

The underground storage tank system tank owner/operator shall complete and submit an application to the Division of Underground Storage Tanks by electronic mail at closure.application.ust@tn.gov for approval 30 days **prior** to closing **any underground portion** of an UST system. T.C.A. §68-215-114(c) states that the tank owner/operator shall be liable to the state for costs of investigation, identification, containment and cleanup, including monitoring and maintenance.

A copy of the approved application shall be available for review during closure of any portion of the UST system.

For UST systems that meet current compliance standards, the application is valid for twelve months from the approval date. The approved application is non-transferable.

If ownership of the UST system changes prior to closure, then a properly completed amended notification form and a new application for permanent closure shall be submitted for Division approval.

1. Date:
2. Facility ID Number:
3. Proposed date of UST system closure:
4. Name of facility:
5. Facility address, including state, city, zip code, and county:
6. Facility phone number:
7. Provide the onsite contact information, including name, email and phone number.
8. Provide the name of Tank Owner/Operator and contact information (mailing address, phone number, email, and contact person).
9. Provide the current use of the facility property (e.g. residential or commercial).
10. Is there a residence within one-tenth (0.1) mile of the UST system? If so, provide the distance (in feet).

FOR STATE USE: DO NOT WRITE IN THIS AREA	
REVIEW DATE:	APPROVED BY:
EXPIRATION DATE:	APPROVAL DATE:

11. Soil samples shall be collected in accordance with the table below. [Section VII.D](#) UST System (or any portion thereof) Closure via Removal Assessment and/or [section VII.E](#) UST System (or any portion thereof) Closure-In-Place of the Guidance Manual shall be followed to determine the appropriate number, location, and depth of required samples. Laboratory analyses are based on the type of product stored. Mark **all** the following that apply:

If closing chemical tanks, then contact the Division of Land Protection – Waste Management Branch at (615) 532-0780. If closing hazardous substance tanks, then contact the Environmental Protection Agency's UST/PCB/OPA Enforcement and Compliance Office at (404) 562-8350.

Product Stored	Sample for	Product Stored	Sample for
____ Gasoline	Benzene Toluene Ethylbenzene Total Xylenes MtBE Naphthalene	____ Waste Oil ____ Used Oil	Naphthalene EPH
____ Diesel ____ Jet Fuel ____ Kerosene	Benzene Toluene Ethylbenzene Total Xylenes MtBE Naphthalene EPH	____ Unknown ____ Aviation Fuel	Benzene Toluene Ethylbenzene Total Xylenes MtBE Naphthalene EDB EDC EPH

Method 8260B shall be used to analyze for Benzene, Toluene, Ethylbenzene, Total Xylenes, MtBE, Naphthalene, EDB, and EDC. Tennessee Extractable Petroleum Hydrocarbons (EPH) Method shall be used to analyze for EPH.

12. Provide the number of all tank compartments registered at this facility.

13. For all tank compartments to be closed, list the tank compartment number, capacity, contents, primary use and date last used. Add additional rows to the below table if more than six (6) tanks are to be closed.

Tank Compartment Number	Capacity (gallons)	Contents (past and present)	Usage*	Date Last Used**

* Retail, Commercial, Heating Oil, Emergency Generator, Residential, Farm, Other.

** Last date tank contained 1 inch or less of product

14. Provide the type of closure (e.g. removal or closure-in-place).

If closure-in-place is proposed, then justification should be included with this application.

If closure-in-place is proposed, provide the inert material selected. The material must have a specific gravity of greater than 1. Liquid or foam materials are not acceptable.

If closure-in-place is proposed and the tank owner/operator is not the property owner, then a notarized approval statement from the property owner shall be included with this application. The statement shall include the facility address, tax map number, and parcel number.

15. For all dispensers to be closed, list the dispenser number, product(s) dispensed, and date last used. Add additional rows to the below table if more than six (6) dispensers are to be closed.

Dispenser Number	Product(s) Dispensed (past and present)	Date Last Used

16. Provide the type of closure for each dispenser (e.g. removal or closure-in-place).

17. If more than one product line trench is present, then all trenches shall be numbered. For all product lines to be closed, list the trench number, trench length (in feet based upon field measurements between tanks and dispensers, as well as between dispenser islands), identify the product distributed through each line, and identify piping material and type. Add additional rows to the below table if more than six (6) product lines are to be closed.

Trench Number	Trench Length	Product Distributed	Piping Material*	Type**

* Steel (ST), Flexible Hose (FLEX), Fiberglass (FRP), Rigid Plastic (RP)

** Single Wall (SW), Double Wall (DW)

18. Provide the type of closure for product lines (e.g. removal or closure-in-place).

19. Provide the name of the laboratory where the samples will be analyzed.

20. Provide the name and contact information of the company/person performing the UST system closure (phone number and email).

21. Provide the name and contact information of the company/person obtaining soil and/or groundwater samples (phone number and email).

22. Provide the name of the facility/property owner and location/address of where contaminated soil will be stockpiled.

All excavated material remaining on the site of generation shall be placed on plastic, covered with plastic, and bermed. If practical, then the material should be segregated according to soil conditions. Proper screening and sampling of the excavated material in accordance with [section VI.B.3](#) Excavated Material Screening, Sampling, and Reporting of the Guidance Manual shall be completed to determine if soil treatment will be necessary. **All excavations must be backfilled with material containing petroleum contaminant levels below the Initial Screening Levels (ISLs).** Refer to [section VI.B.3.c](#) Soil Disposal/Treatment Requirements of the Guidance Manual for further information.

If petroleum contaminated soil is to be treated, then contact the Tennessee Division of Land Protection – Waste Management Branch for approval. Any soil that is excavated from the UST site that is contaminated and is moved offsite is regulated under the Solid Waste Processing and Disposal Rules (Chapter 0400-11-01) or the Hazardous Waste Management Rules (Chapter 0400-12-01) that are both administered by the Division of Land Protection – Waste Management Branch.

23. Provide the name and address of the offsite source for backfill material.
24. If contaminated soil is encountered, describe how the contaminated soil will be treated or disposed. The Division of Land Protection – Waste Management Branch must be contacted for approval prior to treatment or disposal of contaminated soil.
25. Provide the facility/property owner, location/address, and current use of the property (e.g. residential or commercial) where the contaminated soil will be treated, if applicable.
26. Provide the name, location/address, and current use of the property (e.g. residential or commercial) of the disposal facility for the contaminated soil, if applicable.
27. Describe where and how all water with contaminant concentrations greater than the applicable ISLs will be treated and disposed, if applicable:

If water is encountered during closure activities, then the UST project management personnel must be contacted. If water is encountered, then samples must be collected and analyzed in accordance with [section VII](#) Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the Guidance Manual. A maximum of 2500 gallons can be removed and properly managed without notifying the Division.

28. A site map shall be provided depicting on-site buildings, the location of the underground storage tanks, associated product lines and dispensers, sampling points, underground utilities, surface water within one-tenth (0.1) mile of the site, and property lines. Identify the nearest intersecting roads. All tanks, line trenches, and dispensers shall be numbered in accordance with numbers 13, 15, and 17, above. A permanent fixed point must be identified and a distance from the fixed point to the UST system(s) shall be provided, in feet. The site map shall include a north arrow.
THE APPLICATION WILL NOT BE PROCESSED WITHOUT THE SITE MAP.

Signature Page**PERMANENT CLOSURE APPLICATION**

I, (print) _____, Tank Owner, Tank Operator, Petroleum Site Owner, or the Owner's/Operator's Authorized Representative for the petroleum UST system(s) at this facility, agree to submit, within 60 days of collecting the samples, the analytical results for the UST system closure. I am aware of and understand the requirements for permanent closure of regulated petroleum underground storage tanks and what my responsibilities are under the law. I will resolve all environmental problems resulting from a release from the UST system(s) at this site.

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

(Print name & check all that apply)

Signature

Date

☐ Tank Owner

☐ Tank Operator

☐ Petroleum Site Owner

☐ Authorized Representative

Title (Print)

v. Permanent Closure Report (PCR) Template



**Division of Underground
Storage Tanks**

PERMANENT CLOSURE REPORT

THIS REPORT IS NOT COMPLETE UNLESS THE FOLLOWING DOCUMENTS ARE INCLUDED:

Included(Yes/No/NA)

All Information Listed Below and Completed Signature Page

Attachment 1

1. Site Map
2. Topographic Map (if applicable, for WUS only)
3. One-Tenth (0.1) Mile Parcel Map (if applicable, for WUS only)

Attachment 2

1. Soil Analytical Results Table
2. Excavated Soil/Stockpiled Soil Analytical Results Table
3. Groundwater Analytical Results Table
4. Water Supply Well and/or Surface Water Analytical Results Table (if applicable)
5. Water Level Data Table (if applicable)
6. Free Product Removal Table (if applicable)
7. Water Use Determination Analytical Results Table (if applicable, for WUS only)

Attachment 3

1. Boring Logs (soil and/or monitoring well construction logs, if applicable)

Attachment 4

1. Laboratory Analytical Reports (soil and/or water)

Attachment 5

1. Disposal Documentation for Soil
2. Disposal Documentation for Sludge

3. Disposal Documentation for Liquid/Product _____
4. Disposal Documentation for Tanks and/or Piping _____

Attachment 6

1. Replacement Backfill Documentation _____

Attachment 7

1. Inert Material Documentation for Closure-in-place
(i.e. invoices, delivery tickets, etc.) _____

Attachment 8

1. Permit Copies (i.e. fire marshal permit, demolition permit, etc.) _____

Attachment 9

1. Copy of the Amended Notification Form _____

The Amended Notification Form must be sent electronically to notification.fees@tn.gov

Attachment 10

1. Field Documentation _____

Attachment 11

1. Water Use Survey Documentation (if applicable) _____

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3. Groundwater Analytical Results Table	
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5. Water Level Data Table (if applicable).....	
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Attachment 4 – Laboratory Analytical Reports.....	
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2. Disposal Documentation for Sludge	
3. Disposal Documentation for Liquid/Product	
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Attachment 6 –Replacement Backfill Documentation	
Attachment 7 – Inert Material Documentation for Closure-in-place	
Attachment 8 – Permit Copies	
Attachment 9 – Copy of the Amended Notification Form.....	
Attachment 10 – Field Documentation.....	
Attachment 11 – Water Use Survey Documentation (if applicable)	

To complete the tables in this report, open the UST Closure Workbook-Final.xlsx Excel file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate workbook.

DRAFT

The UST system tank owner/operator or property owner shall complete and submit the Permanent Closure Report (PCR) electronically to the Division of Underground Storage Tanks (Division) within 60 days of collecting samples during the UST system closure assessment. T.C.A. §68-215-114(c) states that the tank owner/operator shall be liable to the state for costs of investigation, identification, containment and cleanup, including monitoring and maintenance.

A. General Information

1. Date of Report:
2. Facility Name:
3. Facility ID Number:
4. Facility address, including state, city, zip code, and county (no P.O. Boxes):
5. Were appropriate Division personnel notified at least one working day prior to collecting soil samples for the UST system closure assessment? If yes, provide the Division personnel contacted, date contacted, and person reporting. If not, explain why.

B. UST Closure Preparation

1. Were the tank atmosphere and work zone regularly tested with a combustible gas indicator in accordance with UST Regulations Appendix 0400-18-01-.07-A? If not, explain why.
2. Were the tank(s) purged prior to closure? If no, explain why.
3. If yes, identify the method used to purge the tank atmosphere (e.g. carbon dioxide gas, nitrogen, eductor-type air movers, diffused air blower, dry ice (1.5lb/100 gallon, other):
4. Was product piping drained into the tank? If not, explain why.
5. Was product piping removed? If not, explain why.
6. Were all dispensers removed? If not, explain why.
7. Were all liquids and/or sludge removed from the UST system(s)? If not, explain why.
8. Method of liquid and/or sludge storage:
9. Method of liquid and/or sludge disposal:

C. Tank Removal

Only complete this section if the tank and/or piping were removed during closure.

1. Was the tank(s) labeled in accordance with the UST Regulations Appendix 0400-18-01-.07-A ? If not, explain.
2. Provide the method of UST system storage/disposal (e.g. cut up for disposal, stored on site, stored off site, other). **UST systems stored on site or off site are subject to Rules 0400-18-01-.07(4)(e), (f), (g), and Appendix 0400-18-01-.07-A.**
3. Provide the location (name of business, if applicable, and address) of UST system storage/disposal.
4. If contamination above any initial screening level (ISL) was encountered, then based on visual inspection of the UST components during removal, which component(s) appears to have failed causing the contamination? Include a photo, if available and provide specific details about what was observed (e.g. piping, vent lines, tanks, spill/overflow equipment, dispensers, line leak detectors, submersible pump heads, unknown, none, not applicable, other).
5. What action or process appears to have caused the contamination? (e.g. spills, overfills, pipe and/or joint failure, human error, corrosion, mechanical failure, unknown, not applicable, other):
6. Provide the amount of backfill material initially removed during UST system closure (in cubic yards).
7. Provide the total amount of material over-excavated after removal of the UST system (in cubic yards).
8. A maximum of 6 linear feet (e.g. 2 or 3 standard bucket widths) for sidewalls and 6 feet deeper than the bottom of the excavation is allowed for obviously contaminated soil to be removed prior to sample collection. If more than specified above was removed, were appropriate Division personnel notified? If yes, provide the Division personnel contacted, date contacted, and person reporting. If not, explain why.
9. How was excavated material managed (i.e. landfill, not applicable, or other)?
10. After over-excavation, was free product present in the tank pit or line trench(es)?
11. After tank removal, what material was used to backfill the excavation? Complete the table below.

Check all that apply	
Excavated Soil	
Excavated Gravel	
Gravel/Crushed Rock	
Clean Soil Fill	
Other	

12. If the excavated material was used as backfill, was the material screened and sampled in accordance with [section VI.B.3](#) Excavated Material Screening, Sampling, and Reporting the Guidance Manual and was it found to be below the ISLs prior to use as backfill?
13. If water was encountered during excavation of the UST system, provide a description of the condition of the water (e.g. sheen, free product, foam, etc.) and the total volume of water, in gallons.
14. Provide the total volume of water/free product recovered and the method of disposal. A maximum of 2,500 gallons may be removed without prior division approval.
15. If more than 2,500 gallons of water were removed, were the appropriate Division personnel notified? If yes, provide the Division personnel contacted, date contacted, and person reporting. If not, explain why.
16. Did the water recharge within 24 hours?
17. Was bedrock encountered during UST system removal?
18. Were soil samples collected from the depths specified in [section VII](#) Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the Guidance Manual? Specify in the table below. If not, explain why.

Yes, No or N/A	
Tank(s)	
Product Line Trenches(s)	
Dispenser(s)	

19. Was all contaminated material above the applicable ISL excavated? If not, explain why.

D. Closure-in-Place

Only complete this section if the tank and/or piping were not removed during closure.

1. Provide the inert solid material that was used to fill the tank(s) (e.g. sand, sand/soil, flowable fill, concrete, concrete/bentonite, other).
2. If product lines were closed in place, were they capped?
3. Were soil samples collected from the boring depths specified in section VII Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the Guidance Manual? Specify in the table below. If not, explain why.

Yes, No, or N/A	
Tank(s)	
Product Line Trenches(s)	
Dispenser(s)	

4. Was water encountered in the soil boring(s) during closure-in-place?
5. Was bedrock encountered during UST system closure-in-place?

E. Surface Water Information

1. Is surface water located within one-tenth (0.1) mile of the site?
2. If yes, was the surface water visibly impacted by a petroleum product?

F. Sampling and Reporting

1. Were all samples placed directly into the appropriate containers immediately after collection? If not, explain why.
2. Were all samples immediately placed on ice after collection and maintained at the required temperature in accordance with the applicable laboratory method until delivered to a laboratory? If not, explain why.
3. Was the contaminant concentration for any soil sample collected after removal, closure-in-place, or overexcavation above the ISL for any COC in [Table 1-2 Initial Screening Levels](#)?
4. Was the contaminant concentration for any tankhold water sample above the ISL for any COC listed in [Table 1-2 Initial Screening Levels](#)?
5. In accordance with Rule 0400-18-01-.06, was laboratory confirmation of petroleum contamination above the applicable ISL or discovery of free product reported to the division within 72 hours? If yes, provide the Division personnel contacted, date contacted, and person reporting. If not, explain why.

G. Monitoring Well Installation, Analytical Results and Water Use Survey Information

Only complete this section if a monitoring well was installed during UST closure.

1. In accordance with [section VII](#) Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure, Monitoring Well Installation of the Guidance Manual, provide the requirement(s) that was met for a monitoring well to be installed.
2. Was the monitoring well installed and sampled in accordance with the applicable sections of the Guidance Manual?
3. Did the contaminant concentration in groundwater from the monitoring well sample exceed the drinking water ISL for any COC listed in [Table 1-2 Initial Screening Levels](#)?
4. If the contaminant concentration in groundwater from the monitoring well sample exceeded the drinking water ISL, was a Water Use Survey performed in accordance with [section VI.C](#), Initial Response of the Guidance Manual?
5. If a Water Use Survey was performed, was a drinking water supply or wellhead protection area discovered within a one-half (0.5) mile radius of the site?
6. If a Water Use Survey was performed and no drinking water supplies or wellhead protection areas were discovered within a one-half (0.5) mile radius of the site, did the contaminant concentration in groundwater from the monitoring well sample exceed the non-drinking water ISL for any COC listed in [Table 1-2 Initial Screening Levels](#)?

H. Additional Information and Conclusions

Provide a discussion of any additional information. Discuss the conclusions of the soil and/or groundwater data derived from the permanent closure activities.

Signature Page**PERMANENT CLOSURE REPORT**

The following signature page shall be signed by the Tank Owner, Tank Operator, Petroleum Site Owner, or the Owner's/Operator's Authorized Representative. If over the maximum amount of contaminated soil was overexcavated, contaminated groundwater was encountered, and/ or a monitoring well was installed, then the following signature page shall also be signed by a registered professional geologist under the Tennessee Geologist Act (T.C.A. §62-36-101 et seq.), registered professional engineer under the Tennessee Architects, Engineers, and Landscape Architects, and Interior Designers Law and Rules (T.C.A. §62-2-101 et seq.), or an approved Corrective Action Contractor in accordance with Rule 0400-18-01.-09(15).

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

_____	_____	_____
(Print name & check all that apply)	Signature	Date
☐ Tank Owner		
☐ Tank Operator		
☐ Petroleum Site Owner		
☐ Authorized Representative		

Title (Print)

_____	_____	_____
PE, PG, or CAC (Print name)	Signature	Date

_____	_____
TN Registration #	CAC Company (Print)

Stamp/Seal

Attachment 1 – Figures

- 1. Site Map** – Provide an updated, post-closure site map depicting buildings, roads, utilities, former or existing UST Systems, product lines and dispensers, areas of over-excavation, areas of encountered bedrock, borings, surface water within one-tenth (0.1) mile of the site, and sample points. The map shall also include the location(s) of the soil stockpiles, their dimensions in feet, and the location of screening and sampling points within each stockpile (If due to size constraints, the location of stockpile screening and sampling locations cannot be accurately depicted, then a separate map depicting a layout of the stockpile shall be provided). A measurement shall be included from one corner of each tank excavation zone to a permanent structure (i.e. building, power pole, fire hydrant, etc.). Identify the location of any observed releases. The site map shall include a north arrow.
- 2. Topographic Map (only applicable if a Water Use Survey was conducted)** - Provide a color topographic map depicting the location of all drinking water supplies (wells, springs and/or surface water bodies) within a one-half (0.5) mile radius of the UST site (including the Parcel ID from the water use survey sheets). Provide the site location and the one-quarter (0.25) and one-half (0.5) mile radii from the UST site. If drinking water supplies are identified within one-tenth (0.10) mile radius of the UST site, provide an additional vicinity map showing these locations. Provide a legend detailing the water supply user name, the Parcel ID from the water use survey sheets, etc.
- 3. One-Tenth (0.1) Mile Parcel Map (only applicable if a Water Use Survey was conducted)** - Provide a parcel map of all properties within one-tenth (0.1) mile of the UST system that includes each property labeled with parcel numbers.

Attachment 2 – Tables

- 1. Soil Analytical Results Table** - Provide all field screening and soil analytical results in the applicable Soil Analytical Results Table (titled Soil Analytical Results Table with EPH or Soil Analytical Results Table) located in the UST Closure Workbook.
- 2. Excavated Soil/Stockpiled Soil Analytical Results Table** - Provide all field screening and soil analytical results from the excavated soil/stockpiled soil in the Excavated Soil/Stockpiled Soil Analytical Results Table located in the UST Closure Workbook.

3. **Groundwater Analytical Results Table** – Provide all groundwater analytical results in the applicable Groundwater Analytical Results Table located in the UST Closure Workbook.
4. **Water Supply Well/Surface Water Analytical Results Table** – If applicable, provide all water supply well and/or surface water analytical results in the Water Supply Well/Surface Water Analytical Results Table located in the UST Closure Workbook.
5. **Water Level Data Table** – if applicable, provide all water level data in the Water Level Data Table located in the UST Closure Workbook.
6. **Free Product Removal Table** – If applicable, provide all free product data in the Free Product Removal Table located in the UST Closure Workbook.
7. **Water Use Determination Analytical Results Table (only applicable in specific instances for a Water Use Survey)** – If applicable, provide all analytical results used to determine if the impacted aquifer or water supply met the primary or secondary drinking water standards in the Water Use Determination Table located in the UST Closure Workbook.

Attachment 3 - Boring Logs

Provide all detailed boring logs and monitoring well construction logs completed in accordance with the Standard Drilling Log found in [Appendix 1.h](#) of the Guidance Manual.

Attachment 4 - Laboratory Analytical Reports

All Laboratory Reports to date shall be submitted (segregated by sampling event and in chronological order).

1. **Soil Laboratory Analytical Report**– At a minimum, all laboratory analysis sheets are to include all the requirements listed in [Section VI.B.2.a](#) Laboratory Analytical Reports of the Guidance Manual.
2. **Groundwater Laboratory Analytical Report - At a minimum, all laboratory** analysis sheets are to include all the requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.
3. **Water Supply Well and/or Surface Water Laboratory Analytical Report (if applicable)** - At a minimum, all laboratory analysis sheets are to include all the

requirements listed in Section VI.B.2.a Laboratory Analytical Reports of the Guidance Manual.

Attachment 5 – Disposal Documentation

- 1. Disposal Documentation for Soil** – Provide all documentation generated from the proper disposal of soil.
- 2. Disposal Documentation for Sludge** - Provide all documentation generated from the proper disposal of sludge.
- 3. Disposal Documentation for Liquid/Product** – Provide all documentation generated from the proper disposal of liquid/product.
- 4. Disposal Documentation for Tanks and/or Piping** – Provide all documentation generated from the proper disposal of the tank(s) and piping.

Attachment 6 – Replacement Backfill Documentation

Provide all documentation generated from the replacement backfill used during the UST Closure.

Attachment 7 - Inert Material Documentation for Closure-in-place (if applicable)

Provide all documentation generated from the Inert Material used during closure-in-place activities. This may include invoices, delivery tickets, etc.

Attachment 8 - Permit Copies

Provide a copy of all permits that were required to complete the UST Closure. This may include fire marshal permit, demolition permit, etc.

Attachment 9 – Amended Notification Form

Provide a copy of the Amended Notification Form. **The Amended Notification Form must be sent electronically to notification.fees@tn.gov**

Attachment 10 – Field Documentation

Provide a copy of all original field documentation, including field notes, draft boring logs, well development forms, water gauging sheets, water sampling forms, etc. Field notes shall be maintained in a dedicated logbook or TDEC-UST provided field logs.

Attachment 11 – Water Use Survey (if applicable)

Provide all pertinent documents and information discovered during all stages of the Water Use and Receptor Survey, as well as all below listed documentation.

1. Provide a list of all properties within one-tenth (0.1) mile that coordinates to a labeled parcel map (One-Tenth (0.1) Parcel Map).
2. Provide the completed Water Use Survey Sheets for all properties within one-tenth (0.10) mile (from [Appendix 1.d](#)).
3. Provide the completed Water Use Survey Sheets for all water supplies (wells, springs, and/or surface water bodies) (from [Appendix 1.d](#)) identified within a one-half (0.5) mile radius of the UST site.
4. Provide the Water Well Survey computer printout from the Tennessee Division of Water Resources (DWR) or local government agency for any wells identified within a one-half (0.5) mile radius from the UST site. Highlight all applicable wells on the printout.
5. Provide documentation stating the individual contacted from the Tennessee DWR and/or the authorized local government agency, the date, and the conclusions derived regarding the location of the UST site to any designated Wellhead Protection Area (WPA).

Appendix 2 Fund Reimbursement Guidance Related To Rule 0400-18-01-.09 Petroleum Underground Storage Tank Fund (FRG)

I. GENERAL GUIDANCE

A. Purpose

The purpose of this FRG is to provide detailed descriptions and maximum costs for routine tasks associated with underground storage tank (UST) system closure, hazard management, investigation, and cleanup of petroleum contaminated sites where tank owners, tank operators or petroleum site owners may apply for reimbursement of eligible expenses from the Petroleum Underground Storage Tank Fund (Fund). This document contains rates that the Division of Underground Storage Tanks (Division) considers to be reasonable. Only these rates or lower will be reimbursed unless prior written Division approval is granted. The Division will review reimbursement applications based on this guidance.

Rule 0400-18-01-.09 Petroleum Underground Storage Tank Fund can be located at the following link:

[Link to Underground Storage Tank Rules](#)

T.C.A. § 68-215-111 Use of the Fund can be located at the following link:

[Link to Tennessee Petroleum Underground Storage Tank Act.](#)

B. Applicability

This document replaces all previously published guidance affecting the reimbursement process.

Rule 0400-18-01-.09(3)(d) states “Except as provided for in subparagraph (5)(d) of this rule, before the tank owner or operator or petroleum site owner will receive fund benefit, the applicable deductible amount shall be expended as approved costs by the tank owner or operator or petroleum site owner. The applicable deductible amount is set forth in subparagraph (6)(b) of this rule.”

Rule 0400-18-01-.09(4)(a) states: “If the Division determines that fund eligibility was not established at the time of discovery of a release in accordance with subparagraph (3)(a) or (b) of this rule, corrective action costs and third-party damages associated with that release are not eligible for reimbursement by the fund.”

Rule 0400-18-01-.09(8)(c) states: “The tank owner or operator or petroleum site owner fund deductible amounts as specified in subparagraph (6)(b) of this rule are not eligible for reimbursement from the fund. Proof of payment of these initial amounts is required prior to reimbursement of any costs. The tank owner or operator or

petroleum site owner fund deductible for taking corrective action cannot include any cost defined as fund ineligible in subparagraphs (a) and (b) of this paragraph."

Rule 0400-18-01-.09(9)(c) states: "All claims against the fund are clearly obligations only of the fund and not of the State, and any amounts required to be paid under this part are subject to the availability of sufficient monies in the fund. The full faith and credit of the State shall not in any way be pledged or considered to be available to guarantee payment from such fund."

Rule 0400-18-01-.09(12)(c) states: "Applications for payments may be submitted following acceptance by the Division of completed corrective actions. Such corrective actions may include but are not limited to the following:

1. Completion of hazard management activities that were authorized by the Division, including, but not limited to, provision of an alternate water supply;
2. Completion and submittal of a Hazard Management Report;
3. Development and submittal of an Initial Site Characterization Report;
4. Development and submittal of a Risk Analysis Report;
5. Implementation of interim remediation or risk management activities which were authorized by the Division;
6. Advanced risk-based modeling development which was authorized by the Division; or
7. Development and/or implementation of a Corrective Action Plan which was authorized by the Division."

Rule 0400-18-01-.09(12)(e) states: "All payments shall be subject to approval by the Division. Should a site inspection or other information available to the Division reveal a discrepancy between the work performed and the work addressed by a payment application, the Division may deny payment or may require the fund to be reimbursed."

Rule 0400-18-01-.09(14)(e) states: "Contingent upon availability of funds, the Division shall process all applications for payment as soon as possible upon receipt of application. If the Division determines all costs are reasonable and eligible for reimbursement, payment will be issued within 90 days once costs have been determined to be reasonable and eligible for reimbursement. If the Division determines that certain costs not reasonable or eligible for reimbursement, the Division may issue a check for the amount of the approved costs and provide a 45-day period in which the tank owner or operator or petroleum site owner or contractor may present such information as is necessary to justify the disallowed costs. Following review of such information, the Division may agree to pay the previously disallowed costs, or any portion thereof, or may again disallow the costs for payment. If the Division disallows costs upon a second review, the tank owner or operator or

petroleum site owner may petition the Board for a hearing on the disallowance pursuant to Rule 0400-18-01-.11."

Rule 0400-18-01-.09(15)(a) states: "The CAC is the person responsible for conducting and overseeing the corrective action at a petroleum underground storage tank site. There shall be only one CAC for each site."

Rule 0400-18-01-.09(15)(b)5 states in part: "The CAC shall submit a list of CAC's employees that will be utilized by the CAC as a part of the assessment and remediation of UST sites in Tennessee."

Rule 0400-18-01-.09(15)(b)5(ii) states: "The list of the employees shall be submitted with the application described in part 1 of this subparagraph and annually with a due date of April 1 of each year thereafter."

Rule 0400-18-01-.09(15)(b)5(iii) states: "When a new employee begins working for a CAC, within 15 days of the first day of employment or as soon as their work time will be submitted to the Division for reimbursement, the CAC shall submit the employee information required in subpart (i) of this part to the Division."

C. Application for Fund Eligibility Determination and Reimbursement Application Format

T.C.A. 68-215-111(f)(5)(B) states: "Notwithstanding subdivision (f)(5)(A), the fund shall be responsible for up to a maximum of two million dollars (\$2,000,000) of cleanup costs for sites still undergoing corrective action on July 1, 2015, and releases that occur on or after July 1, 2015. The sum of the deductible and the maximum reimbursement shall not exceed two million dollars (\$2,000,000). The fund shall be responsible for cleanup of contamination due to releases from petroleum underground storage tanks on a per-site, per-occurrence basis."

T.C.A. 68-215-111(f)(7)(A) states: "If there is evidence of a suspected or a confirmed release on or after July 1, 2004, in order for the tank owner, tank operator or petroleum site owner to receive reimbursement from the fund, an application for fund eligibility shall be filed:

(i) Within ninety (90) days of the discovery of evidence of a suspected release which is subsequently confirmed in accordance with the rules promulgated pursuant to this part; or

(ii) Within sixty (60) days of a release which was identified in any manner other than the process for confirmation of a suspected release stated in the rules promulgated pursuant to this part."

T.C.A. 68-215-111(f)(7)(B) states: "The tank owner or tank operator shall send notification to the petroleum site owner by certified mail, return receipt requested, within seven (7) days of confirmation of a release. Failure to comply with the applicable deadline of subdivision (f)(7)(A)(i) or (f)(7)(A)(ii) shall make the release ineligible for reimbursement from the fund."

T.C.A. 68-215-111(f)(8) states: "On or after July 1, 2004, all applications for payment of costs of cleanup shall be received by the division within one (1) year of the performance of the task or tasks covered by that application in order to be eligible for payment from the fund."

D. Fund Eligibility Application Process

The UST Act establishes a deadline for tank owners, tank operators or petroleum site owners to file an Application for Fund Eligibility (CN-0943). **If the application form is not received by the UST Division by the deadline established by law, the release WILL NOT BE FUND ELIGIBLE. The deadlines are:**

- **Within 60 days of the discovery of a confirmed release.**
- **Within 90 days of the discovery of a suspected release which is subsequently confirmed in accordance with the regulatory requirements.**

(NOTE: The 90-day deadline applies even if confirmation of a release does not occur within 90 days of the discovery of evidence of a suspected release. An application should be filed as soon as possible after a release is suspected, even if all the confirmation steps have not been taken.)

The Application for Fund Eligibility (CN-0943) can be submitted to UST.Fund@tn.gov.

E. Scaled Deductibles

All fund eligible releases that occur on or after April 9, 2026, will be entitled to reimbursement from the fund with a maximum deductible of \$5,000. The deductible may be decreased up to 100%, so that there is no deductible, if certain criteria have been met. Additionally, for fund eligible releases that occur on or after April 9, 2026, costs for site checks required in accordance with Rule 0400-18-01-.05(3)(b) will be covered in full at the reasonable rate schedule and are not subject to the deductible.

F. Reimbursement Application Guidelines

Instructions for completing a Reimbursement Application in the cost database are in [section F.10](#) Instructions for Completing Reimbursement Application in the Cost Database.

In order to receive reimbursement, all reimbursement applications must be submitted within one (1) year of the date the work is performed.

1. Initial Reimbursement Application

After a new release has been suspected or confirmed, an Application for Fund Eligibility shall be prepared and submitted within the statutory deadlines. Reimbursement payment applications shall not be submitted until fund eligibility and, if applicable, the deductible have been determined. If the Division approves fund eligibility, a confirmation letter specifying the applicable deductible will be sent to the responsible parties. If the Division denies fund eligibility, an administrative order will be issued to the responsible parties. This order will also include information on the appeal process.

2. Subsequent Reimbursement Applications

Subsequent applications may be submitted at the completion of each major reimbursable task provided they are submitted within one (1) year from the date performed.

3. Final Reimbursement Application

The final application shall be submitted within one (1) year of contamination case closure issued by the Division.

4. Eligible Costs

The following processes include common tasks that are eligible for reimbursement once the applicable deductible has been met, with Division approval.

a. UST System Closure Process

- Over-excavation of contaminated material that is overseen by an approved CAC
- Sample collection after over-excavation and/or recharge of groundwater into the tank pit

- Soil and water laboratory analysis, including routine shipping charges, after over-excavation and/or recharge of groundwater into the tank pit
- Disposal of contaminated soil (including contaminated backfill), contaminated water, and/or free product
- Installation and sampling of monitoring well required for risk-based closure
- Conducting a water use survey
- Preparation of a risk-based closure report (TRBCA Closure Report - includes monitoring well installation, groundwater sampling and/or water use survey, if necessary)
- Completing the Reimbursement Application (2% of total approved reimbursement application amount)

b. Hazard Management Process

- Alternate water supply – providing bottled water, installing water taps, hookup to public water supply, filtration system, and/or drilling a new well. This also includes abandonment of public or private water supplies that are no longer in use.
- Rental of equipment that deals with emergency response (i.e., vapor abatement)
- Recovery of free product
- Sample collection
- Soil, water, and air laboratory analysis, including routine shipping charges
- Disposal of contaminated soil, contaminated water, and/or free product
- Preparation of required submittals
- Completing the Reimbursement Application (2% of total approved reimbursement application amount)

c. Release Investigation Process

- Installation of soil borings and/or monitoring wells
- Rental of equipment related to the investigation of the contaminated site
- Tank tightness tests (if used for a required investigation by the Division)
- Sample collection
- Soil and water laboratory analysis, including routine shipping charges
- Disposal of contaminated soil, contaminated water, and/or free product
- Preparation of required submittals

- Completing the Reimbursement Application (2% of total approved reimbursement application amount)

d. Risk Management and Corrective Action Process

- Public notice advertisements for corrective action
- Construction, delivery, operation, and maintenance of approved treatment systems
- Charges associated with a telemetry system (must be plainly stated in the reimbursement application)
- Rental of equipment for use during remediation of the contaminated site
- Installation of recovery wells, trenches, and associated piping
- Sample collection
- Soil, water, and air laboratory analysis, including routine shipping charges
- Disposal of contaminated soil, contaminated water, and/or free product
- Preparation of required submittals
- Preparation of required permits
- Obtaining necessary utility connections and services
- Completing the Reimbursement Application (2% of total approved reimbursement application amount)

e. Final Site Closure Process

- Public notice advertisements for termination of a corrective action plan
- Deactivation of the treatment system
- Well abandonment
- Decommissioning the treatment system
- Terminating all necessary utility connections, services, and permits
- Site rehabilitation
- Preparation of required submittals
- Completing the Reimbursement Application (2% of total approved reimbursement application amount)

f. Miscellaneous

- Well/boring installation permit(s) and annual well fees (Shelby County) (no markup)
- Bonds required by government agencies (no markup)
- Preparation of required submittals

- Three (3) bids or quotes shall be obtained by the CAC and submitted to the Division for approval for items not listed in the FRG. If three (3) bids or quotes cannot be obtained, a justification shall be submitted with the bids or quotes received for Division approval.
- Three (3) bids or quotes shall be obtained by the CAC and submitted to the Division for approval, which does not include lump sum tasks, in the FRG that cannot be conducted with the rates specified.
- Completing the Reimbursement Application (2% of total approved reimbursement application amount)

5. Ineligible Costs

The following processes include common tasks and specific activities or costs that are not eligible for reimbursement unless approved in writing by the Division.

a. UST System Closure Process

- Activities associated with preparing, removing, and disposing of the tank system, including breaking and removing concrete, removing product from tanks, degassing tanks, etc.
- Replacement backfill material for the volume of the excavated tank(s)
- Completing an Application for Permanent Closure of Underground Storage Tank Systems and/or Permanent Closure Report (not TRBCA Closure Report), Application for Fund Eligibility
- Expedited or rush charges for laboratory analysis of samples without prior Division approval
- Field screening activities for the underground storage tank backfill material
- Rental/lease charges that exceed the purchase price of the equipment
- Removal of backfill material in the tank pit
- Replacement of asphalt or concrete
- Replacement, repair, maintenance, removal, and retrofitting of any UST system unless in accordance with Rule 0400-18-01-.09(7)
- Samples required for tank closure

b. Hazard Management Process

- Monthly water utility bills (if a public water connection was made in response to a release)
- Utility deposits
- Markup on utility bills and/or permits
- Expedited or rush charges for laboratory analysis of samples without prior Division approval
- Rental/lease charges that exceed the purchase price of the equipment
- Replacement of asphalt or concrete (except for trenching with a corrective action system or interceptor trench)

c. Release Investigation Process

- Expedited or rush charges for laboratory analysis of samples without prior Division approval
- Rental/lease charges that exceed the purchase price of the equipment

d. Risk Management and Corrective Action Process

- Monthly water utility bills (if a public water connection was made in response to a release)
- Utility deposits
- Markup on utility bills and/or permits
- Expedited or rush charges for laboratory analysis of samples without prior Division approval
- Rental/lease charges that exceed the purchase price of the equipment
- Replacement of asphalt or concrete (except for trenching with a corrective action system)

e. Miscellaneous

- Any service for which the applicant will receive reimbursement from a commercial insurance carrier
- Corrective action contractor costs
 - Any type of reference book, technical book, and/or guideline
 - Any expedited permit fees
 - Cellular phone charges
 - Computer time, software, hardware, etc.
 - Copy machine and copies
 - Fax transmittals
 - General office supplies
 - Insurance
 - Notary services

- Office equipment and miscellaneous office items
- Overtime charges
- Personal protective equipment (chemical resistant suits, respirators, etc.)
- Postage or express shipping of maps, photographs, reports, etc.
- Property title searches
- Communication charges not associated with a telemetry system
- Video camcorder
- Markup on sales tax
- Markup on freight/shipping
- Markup on mobilization/demobilization
- Markup on lodging and per diem
- Markup on subcontractor reports
- Durable items which are not totally expended on one site such as raincoats, tools, shovels, etc.
- Installation of leak detection
- Legal fees
- Loss of business revenues (business interruption)
- Loss of petroleum product
- Monthly water utility bills where the Division paid for connection to a public water supply
- Responsible Party Costs
 - Administration costs including management, office time, and supplies
 - Any type of reference book, technical book, and/or guideline
 - Cellular phone charges
 - Change of CAC and any costs associated with initial project set-up review, site reconnaissance, etc. including file reviews
 - Computer time, software, hardware, etc.
 - Copy machine and copies
 - Fax transmittals
 - General office supplies
 - Insurance
 - Notary services
 - Office equipment and miscellaneous office items
 - Overtime charges
 - Personal protective equipment (chemical resistant suits, respirators, etc.)

- Postage or express shipping of maps, photographs, reports, etc.
- Property tax
- Property title searches
- Communication charges not associated with a telemetry system
- Video camcorder
- Markup on sales tax
- Markup on freight/shipping
- Markup on mobilization/demobilization
- Markup on lodging and per diem
- Markup on subcontractor reports
- Tank tightness tests used for routine release detection
- Fund Eligibility Site Check
- Travel
 - Airfare and/or car rentals
 - Company car and/or truck rental
 - Markup on per diem and lodging
- Underground locator services (unless approved by the Division in writing)

6. Personnel Descriptions and Rates

a. Staff Descriptions

Only the job titles and classifications listed below may be used for reimbursement purposes. **Any qualified professional who performs a task of a lesser-qualified person should be billed at the rate of that job task.** For example, a person who meets the experience and education of a Geologist, but performs the task of digging a trench, hand augering, bailing wells, etc. should be billed at the rate of a Technician. All onsite personnel shall have the appropriate health and safety certifications. Prior to beginning any task, this document should be consulted to ensure that the proper personnel and equipment will be used in order to be Fund reimbursable. See [section F.8. Task Descriptions](#) for cost task descriptions.

CAD/GIS Operator: This person must have the ability to develop scaled maps, engineering drawings, and contour maps using CAD computer programming software. The CAD/GIS computer operator must have a degree in information systems analysis, CAD computer programming, or possess applicable technical certification.

CAS Specialist: This person must have attended, received, and maintain satisfactory certification from the Division approved manufacturer of high vacuum dual phase remediation systems. Annual (365 days) recertification is required to bill this title. CAS Specialist Certificate must be submitted to: ust.reimbursement@tn.gov.

Engineer: This person must be a professional engineer licensed in the State of Tennessee.

Environmental Specialist: This person must have a Bachelor of Arts (BA), Bachelor of Engineering (BE) or Bachelor of Science (BS) or postgraduate degree in biology, engineering, environmental science, geology, industrial hygiene, soil science, or another science field acceptable to the Division from an accredited four (4) year college and have at least one (1) year of UST related work and/or hazardous substance remedial activities.

General Laborer: This person must have current health and safety training. General laborer includes surveyor helpers, construction workers, and other site workers that have not been included in other billing classifications.

Geologist: This person must be a professional geologist licensed in the State of Tennessee.

Heavy Equipment Operator: This person must be knowledgeable of the capabilities and limitations of the equipment being used and is familiar with all applicable laws and regulations governing its use. Equipment operators must have current health and safety training.

Project Manager (Senior Engineer): This person must be a professional engineer licensed in the State of Tennessee and have 10 years of full-time experience as a licensed professional engineer working in investigation, remedial planning/design, and remedial implementation phases of environmental project management.

Project Manager (Senior Geologist): This person must be a professional geologist licensed in the State of Tennessee and have 10 years of full-time experience as a licensed professional geologist working in investigation, remedial planning/design, and remedial implementation phases of environmental project management.

Project Manager (Other): This person must have 15 years full-time experience in investigation, remedial planning/design, and remedial implementation phases of environmental project management. This person must have a BE, BS or postgraduate degree in engineering, geology, or other appropriate science. This person must also have supervisory and project management experience. Postgraduate work in an appropriate science may be substituted on a year for year basis for experience for a maximum of two (2) years.

Secretary: This person must possess computer skills and carry out general clerical duties, including contract administration and payment of utility bills. Clerical support and other office workers shall be included in this category.

Senior Environmental Specialist: This person must have a BA, BE, BS or postgraduate degree in biology, engineering, environmental science, industrial hygiene, soil science, or another science field acceptable to the Division from an accredited four (4) year college and have at least five (5) years of UST related work and/or hazardous substance remedial activities.

Senior Technician: This person must have current health and safety training, have completed appropriate sampling courses and have at least five (5) years of experience working in the environmental field at hazardous substance or UST sites. All technicians must be high school graduates or have passed the general equivalency diploma (GED) test.

Surveyor: This person must have the ability to take linear and angular measurements and apply the principles of geometry and trigonometry to delineate the form, extent, position, etc., of a tract of land. This person must be licensed in Tennessee as a surveyor.

Technician: This person must have current health and safety training, have completed appropriate sampling courses and have at least one (1) year of experience working in the environmental field at hazardous substance or UST sites. All technicians must be high school graduates or have passed the general equivalency diploma (GED) test.

Truck Driver: This person must be knowledgeable of all Tennessee motor vehicle laws and regulations as well as hold all licenses required for the type of motor vehicle operated.

b. Table of Reimbursable Tasks

Field Staff Description	Reimbursable Tasks
CAS Specialist	MEME events, CAS startup, routine/non-routine O&M, CAS deactivation and/or reactivation
Engineer	Assessment of remedial activities, overseeing drilling and monitoring well installation with appropriate geologic experience, sampling (soil, water, etc.) through the initial investigation phase, compiling/analyzing environmental data, overseeing of MEME events and soil gas survey
Environmental Specialist	Assessment of remedial activities, sampling (soil, water, etc.) through the initial investigation phase, compiling/analyzing environmental data
Geologist	Assessment of remedial activities, overseeing drilling and monitoring well installation, sampling (soil, water, etc.) through the initial investigation phase, compiling/analyzing environmental data, overseeing of MEME events and soil gas survey
Senior Environmental Specialist	Assessment of remedial activities, sampling (soil, water, etc.) through the initial investigation phase, compiling/analyzing environmental data, overseeing of MEME events and soil gas survey
Senior Technician	Routine sampling (monthly, quarterly, etc. of soil, water, etc.), free product removal, monitoring well abandonment oversight, installation/maintenance of skimmer pumps, O&M (routine and non-routine; of a non-state owned CAS), CAS deactivation, reactivation and/or decommissioning
Technician	Gauging, installation/replacements of booms/pads, site restoration, assist with O&M (with Division project manager approval), CAS deactivation, reactivation and/or decommissioning

c. **Table of Staff Rates**

Field Operations Staff	Maximum Hourly Rate
Surveyor	\$99.00
Senior technician	\$75.00
Technician	\$60.00
Heavy equipment operator	\$70.00
General laborer	\$50.00
Technical Staff	Maximum Hourly Rate
Project Manager (Senior Engineer)	\$139.00
Project Manager (Senior Geologist)	\$128.00
Project Manager (Other)	\$128.00
Engineer	\$104.00
Geologist	\$99.00
Senior Environmental Specialist	\$92.00
Environmental Specialist	\$75.00
CAS Specialist	\$85.00
CAD/GIS Operator	\$63.00
Administrative Staff	Maximum Hourly Rate
Secretary	\$43.00

7. **Reasonable Reimbursement Rates**

a. **Equipment**

Construction equipment rental rates already include allowances for peripheral equipment attachments, depreciation, maintenance, field repairs, fuel, permits, lubricants, tires, OSHA equipment, insurance, equipment shelter and security, overhead, markup, and administrative costs. If the equipment size is not specified, then the lowest rate will be applied. Equipment mobilization are subdivided into three categories based on size/weight.

If equipment is utilized for three (3) days or more then the weekly rate applies. If equipment is utilized over two (2) weeks then three (3) bids or quotes for monthly rental shall be obtained and approved prior to activities. In the event equipment cannot be rented at or below the rates, three (3) bids or quotes shall be obtained and approved prior to activities. In the event the CAC or subcontractor owns equipment and rates are deemed too low, then three (3) bids or quotes shall be obtained from rental companies to justify and support the proposed rates are reasonable.

Heavy Equipment	Per Day	Per Week
Skid steer loader (bobcat – Category 1 mobilization)	\$500.00	\$1,300.00
Pavement/concrete breaker for bobcat	\$300.00	\$800.00
Backhoe (all types – Category 1 mobilization)	\$550.00	\$1,350.00
Pavement/concrete breaker for backhoe	\$425.00	\$1,075.00
Mini Excavator (Category 1 mobilization)	\$575.00	\$1,450.00
Trackhoe <50K lbs (Category 2 mobilization)	\$1,100.00	\$2,900.00
Trackhoe ≥50K lbs (Category 3 mobilization) – Division approval required	\$1,400.00	\$3,700.00
Dump Trailer (mobilization charges do not apply)	\$159.00	\$477.00
Dump truck with driver (mobilization charges do not apply)	\$140.00/hr	
Vacuum truck/with driver	\$200.00/hr	
Crane (17-ton skyhook)	\$1,028.00	

Equipment/Supplies/Portable Field Instruments	Unit Cost
Disposable bailer	\$10.00
Bag Filters	\$12.00
0.45 micron water filter (PAHs and metals sampling)	At Cost + 10%
Level 1 Equipment, supplies, and portable field instruments (per day, not per task) barricades, bucket(s), combustible gas indicator with oxygen meter, cooler(s) (for samples), decontamination materials (distilled water, laboratory grade detergent, etc.), disposable gloves (nitrile, latex, etc.), disposal of samples, hand vacuum pump with gauge, hand auger, hose(s)/tubing (includes applicable nozzle(s), clamps, etc.), ice, isopropyl alcohol, ladder, modeling clay or bentonite, multi-gas meter (O ₂ , CO ₂ , CH ₄), oil/water interface probe, OVD (PID or FID, with moisture trap if necessary), paper towels, plastic headspace bags, pump(s) (trash pump, submersible pump, peristaltic pump, etc.), safety cones, sample container(s), spray bottle(s), string/twine/rope, surface water sample dipper, tape (duct tape, electrical tape, masking tape, Teflon tape, etc.), tools/hand tools, trailer, water, poly tank, generator, fence post/stake (bundle), snow fence/safety fence, pH/temperature/conductivity meter	\$50.00
Level 2 Equipment, supplies, and portable field instruments includes all Level 1 equipment and the following list: (per day, not per task) air/velocity meter/temperature gauge, dissolved oxygen meter, MEME fittings, MEME sample train, miscellaneous CAS repair parts (ferenco	\$100.00

fittings, silicone sealant with applicator, PVC parts, etc.), oxidation-reduction potential (ORP) meter, pipe joint compound, rags, surge block, sorbent pads, turbidity/temperature meter, vacuum gauge/manometer, voltage/multi-meter, lubricating grease, air compressor	
Level 3 Equipment, supplies, and portable field instruments includes all Level 1 and 2 equipment and the following list: (per day, not per task) cleaning supplies, pressure sprayer, pressure washer, Rydlyme, string trimmer (weed eater, etc.) wet/dry vacuum Level 3 equipment is only applicable when cleaning major CAS components and as specified in Appendix 2. Major CAS components include air lift compressor, air/oil separator, air/water separator, discharge meter, discharge pump, discharge sump, heat exchanger, oil/water separator and coalescing media, stripperator, and transfer pump(s)	\$400.00

Level 1 through Level 3 equipment, supplies, and portable field instruments are on a per day basis, not per task, unless otherwise noted on a specific task number. Justification and approval shall be obtained prior to field activities for variance and/or more than one level per day (i.e. this will be an exception and not routinely necessary). The equipment, supplies, and portable field instruments are not to be billed by drilling subcontractors, all costs associated with routine drilling is included in the per foot rate.

b. Vehicle Mileage / Mobilization and Demobilization of Equipment

Vehicle	Rate
Autos/all size pick-up trucks (cost/mile)	IRS Business Standard Mileage Rate
3/4 and 1 Ton Pick-up Trucks When used for Towing	Multiplier of 2 of IRS Business Standard Mileage Rate (2 x's)
Mobilization and Demobilization	Rate
Auger/core/wash rotary/air rotary rig and all associated equipment, support truck, etc. (Minimum 100 miles for roundtrip) If over 500 miles roundtrip then three (3) bids required with justification	Multiplier of 9 of IRS Business Standard Mileage Rate (9 x's)
Direct push technology and all associated equipment, support truck, etc. (Minimum of 100 miles for roundtrip) If over 500 miles roundtrip then three (3) bids required with justification	Multiplier of 4.5 of IRS Business Standard Mileage Rate (4.5 x's)
Vehicle/Equipment for Well Abandonment (No minimum mileage) If over 500 miles roundtrip then three (3) bids required with justification	Multiplier of 2 of IRS Business Standard Mileage Rate (2 x's)
Category 1 Excavation equipment (roundtrip mob/demob) Skid steer loader Backhoe Mini excavator >7K lbs. Crane (17-ton skyhook) If over \$500 then three (3) bids required with justification	At Cost
Category 2 Excavation equipment (roundtrip mob/demob) Trackhoe <50K lbs. If over \$1,000 then three (3) bids required with justification	At Cost

Category 3 Excavation equipment (3 bids required) Trackhoe ≥50K lbs.	At approved cost
Vacuum truck with driver (cost/mile) (Minimum of 100 miles for roundtrip) If over 500 miles for roundtrip then three (3) bids required with justification	Multiplier of 4 of IRS Business Standard Mileage Rate (4 x's)

Mileage will be reimbursed in accordance with the state of TN travel regulations, which reference the IRS Business Standard Mileage Rate, in effect at the time that work was performed. The current IRS Business Standard Mileage Rate can be found at the following link:

[IRS Business Standard Mileage Rates](#)

Drilling equipment included in mobilization/demobilization costs are: rig, support vehicles, drum moving equipment, steam cleaner, grout plant, trailers, supplies, water, and crew. Limited to one (1) mobilization/demobilization per event/scope of work unless prior approval obtained.

c. Disposal and Treatment of Contaminated Soil

Contaminated soil and clean soil must be segregated. **Disposal of soil with contaminant concentrations below the Division's applicable cleanup level (e.g., ISL, RBCL, SSCL) will not be reimbursed.** All invoices and weight tickets shall be submitted with the reimbursement application regardless of the treatment method. **Reimbursement will be limited to actual costs plus a maximum 5% markup not to exceed the following rates (additional transportation costs will not be reimbursed, actual dump truck with driver hourly rate will be reimbursed):**

Treatment	Per Ton
Landfarming (must provide cost comparison with landfill for approval from Division project manager)	cost + 5%
Landfill	cost + 5%

d. Disposal and Treatment of Contaminated Water

Reimbursement is limited to water treated at a permitted water treatment facility. The Fund will not pay a per gallon rate for water treated on site. **Disposal and/or treatment of water with contaminant concentrations below the Division's ISLs will not be reimbursed.** Original invoices and manifests, including the volume of water treated shall be submitted with the reimbursement application. **Reimbursement will be limited to actual costs plus a maximum 5% markup not to exceed the following rate (rate includes transportation):**

Contents	Per Gallon
Water	\$0.94
Free Product (3 bids required)	At Approved Cost

e. Drum Disposal of Contaminated Soil, Water, used booms, used absorbent pads, and sediment (includes cost of drum)

Drummed soil and groundwater generated from investigative and corrective action activities will be reimbursed as a per drum cost that includes the drum, disposal, and transport. Other petroleum impacted media, such as used booms or pads along with a combination of free product and other media are included. Soil and water that is drummed is not considered the most efficient way of handling waste and will be scrutinized. Original invoices/manifests shall be submitted with the reimbursement application.

Contents	Per Drum
Water, soil, used booms, pads, etc.	\$300.00

f. Drilling

The per foot drilling rates includes, but is not limited to: drill rig, setup, hand augering, installation, split spoon sampling, continuous sampling, soil sample liners, standby time, third man for drilling, watertight bolt down manhole and a 2'x 2' concrete pad, centralizers, concrete penetration, freight charges for well supplies, well supplies, sand, grout, bentonite, casing, screen, end cap/plug, locking

cap, trailer, decontamination of rig and tools, water for decontamination, decontamination area/containment, drum moving and related equipment, per diem, and lodging. **Reimbursement will be limited to actual costs plus a maximum 10% markup not to exceed the following rates:**

Drilling Method and Equipment	Rate
Auger/core/wash rotary/air rotary rig drilling (if samples are being collected) (Minimum of \$3,500 per scope of work) Two (2) inch wells (cost/foot) Four (4) inch wells (cost/foot)	 \$83.00 \$93.00
Auger/core/wash rotary/air rotary rig drilling (if no samples are being collected, reduced by \$13.00 per foot) (Minimum of \$3,500 per scope of work) Two (2) inch wells (cost/foot) Four (4) inch wells (cost/foot)	 \$70.00 \$80.00
Double cased well [cost/foot to drill and install outside casing including two (2) man crew, steel casing, and grouting] Six (6) inch Eight (8) inch	Submit three (3) bids
Well abandonment (includes licensed well driller, equipment, and supplies) Two (2) inch wells (cost/foot) Four (4) inch wells (cost/foot)	 \$16.00 \$18.00
Well abandonment via overdrilling (cost/foot), must be justified prior to submitting bids Two (2) inch wells (cost/foot) Four (4) inch wells (cost/foot)	Submit three (3) bids
Borings utilizing hollow stem auger (cost/foot)	Submit three (3) bids
Removal of manhole cover and well pad (cost/well)	\$175.00
Recovery well vaults (2'x2'x2') (must be removed)	\$400.00
Direct Push Technology and Equipment	Rate
Direct push	

(Minimum \$3,000 per scope of work)	
Boring advancement (cost/foot)	\$35.00
Two (2) inch well (cost/foot)	\$45.00

g. Laboratory Analyses

Invoices must include the Facility ID number. Only analytical results required by the Division will be reimbursed. NPDES, POTW, TCLP, and other required costs associated with approved Division activities will also be reimbursed. **If GRO, DRO and/or EPH are required to be sampled for permit requirements, then a copy of the discharge permit approval shall be included with each associated reimbursement application.**

The chain of custody for the samples should always be submitted with any analytical charges. Samples received by the laboratory above the EPA Method required temperature may not be reimbursed. When sampling a water supply well, the detection limit shall not exceed the established MCL for that constituent. Any sample that fails to meet minimum detection limits, samples that were improperly collected, or samples that exceed the analytical method holding time may not be reimbursed. **The following analytical results will be reimbursed at actual cost plus a maximum 10% markup not to exceed the following rates:**

Soil Samples (Includes Markup)		Maximum Rate
Chemical of Concern	Method	
BTEX, MtBE, Naphthalene	Method 8260B	\$86.00
BTEX, MtBE, Naphthalene, EDB, EDC	Method 8260B	\$136.00
Extractable Petroleum Hydrocarbons (EPH),	TN EPH	\$85.00
TCLP (extraction and analysis)	Method 1311	\$479.00

Water Samples (Includes Markup)		Maximum Rate
Chemical of Concern	Method	
BTEX, MtBE, Naphthalene	Method 8260B	\$96.00
BTEX, MtBE, Naphthalene, EDB, EDC	Method 8260B	\$146.00
EDB only	Method 8011	\$86.00
PAHs	Method 8270C-SIM/8310	\$150.00
Metals (Cd, Cr, Pb, Ag, Zn)	Method 200.7	\$125.00
Lead (Pb) only	Method 200.7	\$25.00
Fe, Mn for groundwater classification	Method 200.7	\$50.00
Discharge Samples per Permit (Includes Markup)		
Oil & Grease	Method 1664 Revision B	\$58.00
Total suspended solids	Method 160.2	\$21.00
Diesel Range Organics (DRO)	Method 8015	\$85.00
Gasoline Range Organics (GRO)	Method 8015	\$85.00
Extractable Petroleum Hydrocarbons (EPH)	TN EPH	\$85.00
Metals (Cd, Cr, Pb) only	Method 200.7	\$75.00
LC50 Toxicity Test	Method LC50	\$1,175.00
IC25 Toxicity Test	Method IC25	\$1,760.00

Air Samples (Includes Markup)		Maximum Rate
Chemical of Concern	Method	
BTEX, MtBE, Naphthalene, Isopropyl Alcohol	Method TO-15	\$295.00
Percent O ₂ and CO ₂ (must be analyzed concurrently from SUMMA [®] sample above)	Method ASTM 1945/1946/ D5314 or EPA Method 3C	\$110.00

h. Travel Expenses and Per Diem

Meals will not be reimbursed without a corresponding hotel/motel receipt. Only one (1) day of meals will be reimbursed per overnight stay. Lodging and per diem will be reimbursed in accordance with the U.S. General Services CONUS per diem rates in effect at the time that the work was performed. Current U.S. General Services CONUS per diem rates can be found at the following link:

[CONUS Per Diem Rates](#)

i. Other

Each task provides a maximum cost. This cost represents the maximum the Division **may** reimburse if the work is acceptable and conducted as approved. Only actual charges, not the maximum, will be reimbursed. For example, a task may allow a maximum of up to ten (10) hours to conduct the work, but the actual work performed by contractor personnel was five (5) hours. Only five (5) hours may be requested for reimbursement.

A detailed time sheet and/or field log/book shall be kept for every UST task conducted although they may not be required to be submitted with the application. The Division may request these to verify claim amounts. Time reporting should be broken into fifteen (15) minute increments (i.e., 0.25 hr; 1.75 hrs; etc.). Any other time increments will not be properly calculated by the reimbursement database.

8. Task Descriptions

1.0 UST SYSTEM CLOSURE PROCESS

Task 1.1 Over-excavation

1.1.a Cost for excavating soil, either stockpiling or hauling and disposal, and backfilling during UST Closure

This task will include all necessary personnel and labor, equipment and supplies/portable field instruments to excavate, screen, collect samples, and backfill during an UST system closure as per [section VII](#) Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the current guidelines. The task for loading, hauling, and disposal of contaminated stockpiled soils can be found in Task 1.1.c.

If the extent of contamination is known and disposal permitting has also been obtained (i.e. a second mobilization is not required), cost for hauling and disposal is also included in this task. **Disposal of excavated material with contamination levels below the Division's applicable cleanup levels may not be reimbursed.** The disposal method, permitted landfill or permitted landfarm, shall be the most cost-effective. Transportation shall be by the most cost-effective method including trucks loaded to, or just below, their maximum legal capacity. **Reimbursement will be limited to actual costs plus a maximum 5% markup.**

This task includes personnel time to coordinate this task and to manage laboratory services (i.e., Chain of Custody, sample preparation, sample quality assurance/quality control (QA/QC), and invoice managing). Reimbursement is limited to excavation and stockpiling, or hauling and disposal if applicable, of contaminated soil. **Soil contamination as defined by [section VII](#) Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the current guidelines must be documented by an approved State of Tennessee laboratory method.** Backfill material equivalent to the volume of the tanks is not a reimbursable expense. Routine over-excavation activities shall not exceed five (5) workdays (10-hour workday) without prior approval from the Division project manager.

For equipment utilized 3 or more consecutive days, the weekly rate is applicable. For equipment utilized 2 or more consecutive weeks, 3 bids or quotes for monthly rate should be submitted for prior Division approval.

Personnel cost is hourly, not to exceed \$3,079.00 per day and is dependent on personnel conducting the work.

Maximum equipment cost is \$3,150.00 per day.

1.1.b Cost for mobilization and demobilization of heavy equipment

This task will include mobilization and demobilization of the necessary equipment.

Category 1 equipment is at cost not to exceed \$500.00. If the cost is over \$500.00 then submission of 3 bids and prior Division approval is required.

Category 2 equipment is at cost not to exceed \$1,000.00. If the cost is over \$1,000.00 then submission of 3 bids and prior Division approval is required.

Category 3 equipment mobilization requires submission of 3 bids and prior Division approval.

No markup will be reimbursed.

1.1.c Cost for loading stockpiled contaminated soil for disposal

This task will include all necessary personnel and labor, equipment, and supplies for loading petroleum contaminated soil, hauling and proper disposal at a permitted facility. Routine loading, hauling and disposal shall not exceed one (1) workday (10-hour workday). For equipment utilized 3 or more consecutive days, the weekly rate is applicable. For equipment utilized 2 or more consecutive weeks, 3 bids or quotes for monthly rate should be submitted for prior Division approval.

The disposal method, permitted landfill or permitted landfarm, shall be the most cost-effective. Transportation shall be by the most cost effective method including trucks loaded to, or just below, their maximum legal capacity. **Reimbursement of disposal will be limited to actual costs plus a maximum 5% markup. Disposal of soil with contamination levels below the Division's applicable cleanup levels will not be reimbursed.**

Project management time is limited to \$417.00 per event/scope of work and is dependent on personnel overseeing the work.

Onsite personnel cost is hourly not to exceed \$2,940.00 per day and is dependent on personnel conducting the work.

Maximum equipment cost is \$3,050.00 per day.

1.1.d Cost for laboratory services

This task will include any soil laboratory analysis not associated with a boring or monitoring well installation. These samples may include, but are not necessarily limited to, samples from a tank pit, samples of a stockpile for disposal or treatment, interceptor trench, or samples that are obtained by hand augering. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Maximum costs shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method, established in [Table 1-1 Chemicals of Concern](#).

- 1.1.e RESCINDED, included in task 1.1.a Cost for replacement backfill material during any type of over-excavation

- 1.1.f RESCINDED, included in task 1.1.a Cost for backfilling the tank pit and/or associated piping trench(s) during over-excavation

Task 1.2 Groundwater/Free Product Removal (UST System Closure Process)

1.2.a Cost for removing contaminated groundwater and/or free product using a vacuum/pump truck

This task will include all necessary equipment (such as a vacuum or pump truck) and personnel time (such as truck driver, or technician and CAC), to monitor the removal of contaminated groundwater and/or free product from a tank excavation, pit, trench, vault, etc. **Groundwater contamination as defined by the applicable Closure Guidelines must be documented by an approved state of Tennessee laboratory method.** This task does not include the cost of laboratory analyses of samples collected. Routine groundwater/free product removal shall not exceed ten (10) hours without prior Division approval. Hourly rates for vacuum or pump truck should not be billed during mobilization and demobilization, the hourly rate is only applicable during vacuuming time plus one (1) hour to assemble/disassemble hoses and other components.

Personnel cost is hourly not to exceed \$1,179.00 per day and is dependent on personnel conducting the work.

Maximum equipment cost is \$200.00 per hour, not to exceed \$2,000.00 per day.

1.2.b Cost for mobilization and demobilization of vacuum/pump truck

This task will include mobilization and demobilization of the vacuum truck or pump truck to and from site for groundwater/free product removal. Hourly rates for vacuum or pump truck should not be billed during mobilization and demobilization.

Maximum roundtrip is 500 miles, mileage rate is 4 x IRS Business Standard Mileage Rate at the time the work is conducted.

1.2.c Cost for inspecting/sampling tank pit for groundwater recharge

This task will include any personnel time and the applicable equipment/supplies/portable field instruments to inspect and/or collect a groundwater sample for laboratory analysis from a tank pit, utility trench, or interceptor trench. This task includes personnel time to coordinate this task and to manage laboratory services (i.e., Chain of Custody, sample preparation, sample QA/QC, and invoice managing). Maximum on-site personnel time limited to two (2) hours.

Maximum number of samples is two (2) per tank pit and/or two (2) per installation.

Maximum cost is \$210.00 per event.

1.2.d Cost for laboratory services

This task will include any groundwater laboratory analysis not associated with a boring or monitoring well installation. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Maximum costs shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

1.2.e Cost for disposal of free product and/or groundwater contaminated with petroleum product

This task consists of disposal of free product and/or groundwater contaminated with petroleum product removed from a tank pit, trench, etc. **The volume of free product and/or groundwater contaminated with petroleum product requested for reimbursement must agree with the volume documented in the Permanent Closure Report and manifest(s).** Groundwater contamination as defined by the [section VII Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the current guidelines](#) must be documented by an approved state of Tennessee laboratory method. The Fund will not pay a per gallon rate for water treated on site.

Reimbursement will be limited to actual costs plus a maximum of 5% markup not to exceed \$0.94 per gallon. If free product disposal cost exceeds \$0.94 per gallon, three bids or quotes and prior Division approval are required.

Task 1.3 RESCINDED Soil Treatment/Disposal (UST System Closure Process)

Task 1.3.a RESCINDED Soil Treatment by Aeration (UST System Closure Process)

Task 1.3.b RESCINDED, included in either 1.1.a or 1.1.c Hauling and Soil Disposal by Landfilling (UST System Closure Process)

Task 1.3.c RESCINDED, included in either task 1.1.a or 1.1.c Soil Treatment by Landfarming (UST System Closure Process)

Task 1.4 TRBCA Closure Process (UST System Closure Process)

1.4.a Cost for scheduling drilling event

This task will include all necessary contracting and scheduling for a driller to perform all phases of drilling (i.e., soil borings, installation of monitoring wells, perform well development, boring abandonment, and various other drilling tasks as needed). This task shall include the scheduling of field activities associated with the drilling event, including

locating all underground utilities. This task shall also include all personnel cost necessary to acquire all well permits from the appropriate agency.

Maximum cost is \$417.00 and is dependent on personnel conducting the work.

1.4.b Cost for supervision of field work

This task shall include oversight of field activities as well as office support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*), and the necessary equipment to supervise and manage drilling activities. Cost includes all personnel time and equipment/supplies/portable field instruments. Included in the task, the CAC is required to complete all boring logs, well construction records, and collect all necessary soil samples including samples for soil disposal. Supervisory time should not exceed drilling time.

Maximum cost (personnel and equipment) per day is \$1,279.00 and is dependent on personnel conducting the work.

1.4.c Cost for mobilization/demobilization of drill rig

This task will include mobilization and demobilization of the drill rig, support vehicles, steam cleaner, grout plant, trailers, and crew to and from the site. Limited to a single mobilization/demobilization per scope of work/event.

A minimum of 100 miles roundtrip is allowed for each event/scope of work. **Maximum roundtrip mileage is 500 miles and cost is limited to 9 x IRS Business Standard Mileage Rate.**

1.4.d Cost for drilling

This task reasonable rate is all inclusive, no additional time, material, equipment, lodging, or per diem will be approved. The CAC must submit the drilling invoice with the reimbursement application. All monitoring wells shall be installed and abandoned by a TN licensed well driller . The cost of drilling will be reimbursed at cost plus **10% markup** not to exceed the reasonable rate schedule. A markup will not be allowed if the CAC uses their own driller.

Maximum cost is \$83.00 per foot and is all inclusive (i.e. no additional time, material, or equipment).

1.4.e Cost for well development

This task will include all necessary personnel (TN licensed geologist, TN licensed engineer, senior environmental specialist, environmental specialist, or senior technician), labor, equipment and supplies to properly develop wells in accordance with the applicable guidance(twenty-four (24) hours after installation). This task does not include drum costs. All wells are required to be properly developed prior to sampling. This includes surge blocking where needed.

Maximum cost (personnel and equipment) for one well is \$318.00 and is dependent on personnel conducting the work.

1.4.f Cost for groundwater sampling

This task is no longer lump sum, the current rate structure includes all personnel time to collect static water level measurement(s), calculate purge volume(s), purge well(s) of any depth or diameter, sample well(s), and sampling of purge water for disposal. This task also includes personnel time to coordinate this task and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. Does not include drum costs.

Project management time is limited to \$417.00 per event/scope of work and is dependent on personnel overseeing the work.

Maximum cost for sampling one well is \$220.00 plus the cost of the 0.45-micron filter, if applicable.

1.4.g Cost for laboratory services

This task includes laboratory costs associated with all sampling of soil and/or water. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **Only analytical test(s) required by [section VII Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the current guidelines](#) will be reimbursed.** The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.

Maximum cost shall not exceed the reasonable reimbursable rates for the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

1.4.h Cost for water use and Karst survey

This task includes preparation of a water use and Karst survey in accordance with the current guidelines. This task includes all field work, telephone contacts and records search. This task includes the completion of the Water Use Survey Sheets. **This task is not repeatable unless requested/approved by the Division.**

Maximum cost is \$1,308.00 and is dependent on personnel conducting the work.

- 1.4.i RESCINDED, included in task 8.1.a Cost for disposal of free product and/or groundwater contaminated with petroleum product

1.4.j Cost for disposal of stockpiled soil from well installation

This task will include all costs necessary for disposal of stockpiled soil from monitoring well installation at a permitted landfill or permitted landfarm.

Reimbursement will be limited to actual costs plus a maximum 5% markup.

1.4.k RESCINDED, included in task 8.1.a Cost for disposal of petroleum contaminated soil in drums

2.0 HAZARD MANAGEMENT PROCESS

Task 2.1 Interceptor/Recovery Trench Installation (with Division approval only)

2.1.a Cost for interceptor/recovery trench design and approval

This task will include all personnel time to prepare a map for the proposed interceptor/recovery trench layout, cross-sections and details as needed for proper construction. This task will include any project coordination time including cost estimates, equipment procurement/rental, and meeting with the responsible party and Division/Department staff.

Maximum cost is \$949.00 and is dependent on personnel conducting the work.

2.1.b RESCINDED, included in task 2.1.c Cost for mobilization and demobilization of heavy equipment

2.1.c Cost for interceptor/recovery trench installation

This task will include all necessary personnel and labor, equipment mobilization and demobilization, equipment, and supplies to excavate, properly install and collect samples

from a passive interceptor/recovery trench. Cost includes location of utilities, removal of any concrete, asphalt and/or soil during installation, loading and hauling soil for proper disposal, backfill, and restoration (i.e. repair of asphalt, concrete and/or landscaping. Cost also includes all sampling supplies, equipment and trench supplies such as a trackhoe or backhoe, well screens, piping, and sumps.

Soil shall be disposed of at a permitted facility. The weight (in tons) of the contaminated material requested for reimbursement should correlate with the volume of the contaminated area during the installation as reported in the applicable report. Disposal cost is at cost plus 5%.

The weight (in tons) of the backfill material requested for reimbursement should correlate with the volume of the trench. Backfill must be acquired/purchased locally whenever possible and at cost plus 10%, which includes transportation.

Routine installation shall not exceed one (1) workday (maximum 10-hour workday) without prior approval from the Division project manager.

Maximum cost is equal to the proposed cost and any change orders that is approved by the Division prior to completing the work.

- 2.1.d RESCINDED, included in 2.1.c Cost for loading stockpiled contaminated soil for disposal
- 2.1.e RESCINDED, included in 2.1.c Cost for replacement backfill material during any type of excavation
- 2.1.f RESCINDED, included in 2.1.c Cost for repair/replacement of asphalt after interceptor/recovery trench installation
- 2.1.g RESCINDED, included in 2.1.c Cost for repair/replacement of concrete after interceptor/recovery trench installation

2.1.h RESCINDED, included in 2.1.c Cost for repair/replacement of landscaping after interceptor/recovery trench installation

2.1.i RESCINDED, included in 2.1.c Cost for backfilling the void and/or associated trench(s) during excavation

Task 2.2 Groundwater/Free Product Removal from an Interceptor/Recovery Trench (with Division approval only)

2.2.a Cost for removing contaminated groundwater and/or free product using a vacuum/pump truck from an interceptor/recovery trench

This task will include all necessary equipment (such as a vacuum or pump truck) and personnel (such as truck driver, CAC, or technician), to monitor the removal of contaminated groundwater and/or free product from an interceptor/recovery trench installation. **Groundwater contamination must be documented by an approved state of Tennessee laboratory method.** This task does not include the cost of laboratory analyses of samples collected. The vacuum or pump truck and driver hourly rate should only be for vacuum time plus one (1) hour to assemble/disassemble hoses and other components, the hourly rate should not be charged during mobilization and demobilization.

Maximum cost is \$275.00 per hour (or \$2,750.00 per day).

2.2.b Cost for mobilization and demobilization of vacuum/pump truck

This task will include mobilization and demobilization of the vacuum truck or pump truck to and from site. The hourly vacuum or pump truck and driver rate should not be charged during mobilization and demobilization.

Maximum cost is limited to 4 x IRS Business Standard Mileage Rate.

2.2.c Cost for groundwater sample collected for laboratory analysis and supplies (not associated with a boring/monitoring well)

This task will include any personnel time and sampling supplies to collect a groundwater sample for laboratory analysis during interceptor/recovery trench installation. This task includes personnel time to coordinate this task and to manage laboratory services (i.e., Chain of Custody, sample preparation, sample QA/QC, and invoice managing). Maximum on-site personnel time limited to two (2) hours.

**Maximum number of samples is two (2) per trench and/or two (2) per installation.
Maximum cost is \$220.00 per event.**

2.2.d Cost for laboratory services

This task will include any groundwater laboratory analysis collected during interceptor/recovery trench installation. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab. **Maximum number of samples is two (2) per trench and/or two (2) per installation.**

Maximum costs shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

2.2.e Cost for disposal of free product and/or groundwater contaminated with petroleum product

This task consists of disposal of free product and/or groundwater contaminated with petroleum product removed from a tank pit, trench, etc. **The volume of free product and/or groundwater contaminated as defined by [section VII](#) Guidance Related to Rule 0400-18-01-.07 Out-of-Service UST Systems and Closure of the current guidelines, the**

amount requested for reimbursement must agree with the volume documented in the Initial Response and Hazard Management Report and manifest(s). Groundwater contamination must be documented by an approved state of Tennessee laboratory method. The Fund will not pay a per gallon rate for water treated on site.

Reimbursement will be limited to actual costs plus a maximum of 5% markup not to exceed \$0.94 per gallon. If the free product disposal cost exceeds \$0.94 per gallon, three bids or quotes and prior Division approval are required.

2.2.f RESCINDED Cost for obtaining a temporary permit to POTW

2.2.g RESCINDED Cost for obtaining a groundwater sample collected to meet POTW discharge requirements

2.2.h RESCINDED Cost for discharge to POTW

Task 2.3 Free Product Removal by Hand Bailing (with Division approval only)

2.3.a Cost for removing free product by hand bailing

This task will include all necessary personnel and equipment/supplies/portable field instruments to remove free product from a monitoring well or observation well and properly store when encountered. This task includes measurement and recording of groundwater depths and product thickness in each well. **Task is not intended to be a viable method for short or long term free product recovery. Justification and approval must be obtained prior to conducting this task.**

Maximum cost (personnel and equipment) is \$949.00 per event and is dependent on personnel conducting the work and the number of wells.

2.3.b RESCINDED, included in task 8.1.a Cost for disposal of free product

Task 2.4 Mobile Enhanced Multi-phase Extraction (MEME)

2.4.a Cost for scheduling MEME event

This task will consist of coordinating and scheduling the MEME event.

Maximum cost is \$278.00 per event and is dependent on personnel conducting the work.

2.4.b Cost for mobilization and demobilization of vacuum truck

This task will include mobilization and demobilization of the MEME truck to and from site. A trailer mounted dual-phase extraction unit may be deemed comparable to a MEME Truck based on site specifications. Recovered fluids shall be temporarily placed in appropriate containers and removed immediately upon completion of the MEME event. Recovered fluids shall be disposed of and transported in accordance with all federal, state, and local regulations.

Maximum roundtrip is limited to 500 miles and cost is limited to 4 x IRS Business Standard Mileage Rate.

2.4.c Cost for supervision of 8-hour MEME event field work

This task will include all personnel time for the supervision of one (1) complete 8-hour MEME event. This task includes one (1) field person to oversee MEME activities. This task includes, if not conducted by the MEME contractor, tabulating results (free product and groundwater measurements before and after the event plus vacuum pressure on affected wells during the event), recording the amount of product and water recovered, vacuum radius of influence, ensuring all readings by the MEME contractor is obtained, etc.

Maximum cost (personnel and equipment) is \$1,279.00 and is dependent on personnel conducting the work.

2.4.d Cost for performing an 8-hour MEME event

This task will include the setup and performance of one (1) 8-hour MEME event according to the approved application. This task will include personnel and equipment to perform one (1) eight (8) hour MEME event. Required equipment also includes instrumentation for measuring temperature, velocity, vacuum, relative humidity, the concentration of emissions, the amount of product and water recovered. A trailer mounted dual-phase extraction unit may be deemed comparable to a MEME Truck based on site specifications. Recovered fluids shall be temporarily placed in appropriate containers and removed immediately upon completion of the MEME event. and shall be disposed of and transported in accordance with all federal, state, and local regulations. A trailer mounted dual-phase extraction unit may be deemed comparable to a MEME Truck based on site specifications. Recovered fluids shall be temporarily placed in appropriate containers and removed immediately upon completion of the MEME event. Recovered fluids shall be disposed of and transported in accordance with all federal, state, and local regulations. Cost includes two (2) hours allowed for set-up and shut down and eight (8) hours for the actual MEME event.

Maximum cost is bid plus 10% markup. Submit as a lump sum bid and applicable change orders to the Division and obtain approval in writing.

2.4.e Cost for performing a 24-hour MEME event

This task will include the setup and performance of one (1) 24-hour MEME event according to the approved application. This task will include personnel and equipment to perform one (1) twenty-four hour MEME event. Required equipment also includes instrumentation for measuring temperature, velocity, vacuum, relative humidity, and the concentration of emissions. A trailer mounted dual-phase extraction unit may be deemed comparable to a MEME Truck based on site specifications. Recovered fluids shall be temporarily placed in

appropriate containers and removed immediately upon completion of the MEME event. and shall be disposed of and transported in accordance with all federal, state, and local regulations. Cost includes two (2) hours allowed for set-up and shut down and 24 hours for the actual MEME event.

Maximum cost is bid plus 10% markup. Submit as a lump sum bid and applicable change orders to the Division and obtain approval in writing

2.4.f Cost for disposal of free product and/or groundwater contaminated with petroleum product

This task consists of disposal of free product and/or groundwater contaminated with petroleum product removed during a MEME event. **The volume of free product and/or groundwater contaminated with petroleum product requested for reimbursement must agree with the volume documented in the MEME Report and disposal manifest(s).**

Reimbursement will be limited to actual costs plus a maximum of 5% markup not to exceed \$0.94 per gallon. If the free product disposal cost exceeds \$0.94 per gallon, three bids or quotes and prior Division approval are required.

2.4.g Cost for free product assessment after an 8-hour or 24-hour MEME event

This task includes measurement and recording of groundwater depth and product thickness of each well after a free product recovery event. The intent of this task is to determine if the free product recovery method should be continued. A recommendation shall be provided as to the status of free product in the wells and the most appropriate course of further action. This task should only be proposed if site conditions, number of wells, and thickness of free product warrant more time than allowed for the MEME event oversight. This task can be conducted on a different date following completion of the MEME event. Cost includes personnel and labor, equipment, and supplies.

Maximum cost (personnel and equipment) is \$457.00 per event and is dependent on personnel conducting the work.

2.4.h Cost for laboratory services

This task includes laboratory costs associated with all sampling of influent groundwater. CAC must submit the laboratory invoice and chain of custody with the reimbursement application. The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.

Maximum cost shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

2.4.i Cost for supervision of 24-hour MEME event field work

This task will include all personnel time for the supervision of one (1) complete MEME event. This task includes field personnel to oversee 24-hour MEME activities, assemble the sample train and collect the influent water sample. The preferred personnel are CAS Specialists.

Maximum cost (personnel and equipment) is \$2,588.00 per event and is dependent on personnel conducting the work.

Task 2.5 Free Product Recovery on Surface Water

2.5.a Cost for installation of absorbent pads and/or booms on surface water, inspection and replacement.

This task will include all personnel time to install/lay booms or absorbent pads to recover free-floating product from impacted surface waters. This task includes all field materials used including absorbent booms, absorbent pads, polypropylene rope, steel fence posts,

and field supplies initially and during subsequent inspection and replacement. All personnel time, frequency of inspections, and durations shall be included in the proposal/bid.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

2.5.b RESCINDED, included in task 2.5.a Cost for boom inspection and replacement

2.5.c RESCINDED, included in task 8.1.a Cost of drums for spent booms and/or absorbent pads

2.5.d RESCINDED, included in task 8.1.a Cost for disposal of drums filled with spent booms and/or absorbent pads

2.5.e Cost for specifying and purchasing a passive skimmer for surface water

This task will include all necessary personnel time to properly specify and purchase a passive skimmer system to remove free product from surface water, installation, and servicing. All personnel time, frequency of inspections, and durations shall be included in the proposal/bid.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

2.5.f RESCINDED, included in task 2.5.e Cost for installation of a passive skimmer

2.5.g RESCINDED, included in task 2.5.e Cost for servicing a passive skimmer

Task 2.6 Continuous Free Product Removal (with Division approval only)

2.6.a Cost for specifying and purchasing a passive skimmer or absorbent sock for monitoring well(s)

This task will include all necessary personnel time to properly specify and purchase a passive skimmer system to remove free product from a monitoring well as well as inspections, servicing passive skimmers, or replacing absorbent socks. All personnel time, equipment, frequency of inspections, and durations shall be included in the proposal/bid.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

2.6.b RESCINDED, included in 2.6.a Cost for installation of a passive skimmer or absorbent pad/sock

2.6.c RESCINDED, included in 2.6.a Cost for servicing a passive skimmer

Task 2.7 Impacted Drinking Water Management

2.7.a Cost for temporary response activities

This task will consist of notifying the groundwater user of impact to their water supply and delivery of bottled water or installation of a temporary purification system.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

2.7.b Cost for permanent response activities

This task will include the cost to implement the Division approved Impacted Drinking Water Supply Permanent Response – Proposal (Task 6.5.c) and change order(s) if applicable, approved in writing by the Division.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

Task 2.8 Petroleum Vapor Impact Management

2.8.a Cost for temporary response activities

This task will consist of notifying the affected occupants and/or property owners of impacted buildings or utility districts of impacted utilities concerning the vapor hazard and proposed temporary actions. This task also includes implementation of temporary response actions.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

2.8.b Cost for permanent response activities

This task will include the cost to implement the Division approved Petroleum Vapor Impact Response - Proposal (Task 6.6.b) and change order(s) if applicable, approved in writing by the Division.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

2.8.c Cost for permit and/or utility service

This task includes all personnel time necessary to secure permits and/or utility connections with federal, state, and/or local government agency requirements.

Maximum cost is \$347.00 and is dependent on personnel conducting the work

3.0 RELEASE INVESTIGATION PROCESS

Task 3.1 Project Management

3.1.a Cost for initial project setup and review

This task will include all personnel time to review existing site data, including incident information, past site history, agency requirements (NOD, NOV, etc.), previous assessments and remediation (closure reports, IRHMR, ISCR, etc.). This task assumes client will provide CAC with all available information plus all reimbursement documentation. **This task is not repeatable per release.**

Maximum cost is \$823.00 and is dependent on personnel conducting the work.

3.1.b Cost for site reconnaissance

This task will include all personnel time to locate and identify potential receptors such as water wells, surface waters, basements, public utilities, and to locate and identify all potentially affected parties, including names and addresses. This task will also consist of gathering information about the site so that a detailed site map and site vicinity map can be later generated from field observation (i.e., location of discharge and extent, identification of all receptors, monitoring wells, and other site features). This task includes project manager oversight and staff level persons (or equal) to perform field work, telephone coordination with property owners and local city and state government agencies. This task includes data review, evaluation, and reporting (client, property owners, Division's files, etc.). If a previous CAC has already completed this task, then it should not be duplicated unless requested by the Division.

Maximum cost is \$1,222.00 and is dependent on personnel conducting the work.

3.1.c Cost for offsite access (grant of access)

This task will include all personnel time to acquire a grant-of-access from adjacent and nearby property owners. Access purposes may include, but are not limited to borings and

soil sampling, monitoring, and recovery well installation, city or county waterline hookup, easements, etc.

Maximum cost is \$555.00 per agreement and is dependent on personnel conducting the work.

3.1.d Cost for pre-Corrective Action Plan meeting

This task will include the meeting held between Division personnel, the CAC and/or the responsible party, as deemed necessary by the Division prior to submission of a CAP. Topics for discussion shall include but not limited to measured drawdown and radius of influence during the 24 hour MEME event, extraction rates for soil vapor and groundwater, advanced site characterization if applicable, number of proposed soil vapor extraction or recovery wells, current wells with free product and thickness, permit requirements (treated water, air, construction, etc.), electrical supply availability and local requirements, and site obstructions (hindrances to CAS delivery and/or placement). This may include any time for a meeting that may be conducted onsite, at a local field office, or virtually. Maximum cost includes the time required for oversight by the Project Manager and a staff level person to schedule and compile aforementioned information in a suitable format to present/review during the meeting. Time includes the meeting itself.

Maximum cost is \$1,944.00 per meeting and is dependent on personnel conducting the work.

Task 3.2 System Test

3.2.a Cost for system test

The UST system tightness testing is reimbursable for release investigations only. An approved tightness test for a release investigation will follow Rule 0400-18-01-.05(3)(a). All tightness test methods must be third party certified. **System tightness testing for system compliance is not reimbursable.**

Maximum cost is actual invoice cost from tightness tester.

3.2.b Cost for Fund Deductible Compliance Inspection

This task shall include field activities as well as office support and coordination in assisting the Division in conducting compliance inspections resulting from a reported suspected or confirmed release. This includes opening of tank tops, sumps, dispensers, and obtaining necessary release detection and operational compliance paperwork. Maximum on-site personnel time limited to four (4) hours and one (1) hour offsite.

Compliance inspections conducted to establish a fund deductible of a suspected/confirmed release as required under rule 0400-18-01-.09(6) are reimbursable. This applies only to inspections scheduled from a suspected release reported to the Division. **Routine three-year compliance inspections including those in which a suspected release is discovered, or any follow up visits to address non-compliance issues discovered during a reimbursable compliance inspection are non-reimbursable.**

Task 3.3 Drilling

3.3.a Cost for scheduling drilling event

This task will include all necessary contracting and scheduling for a driller to perform all phases of drilling (i.e., soil borings, installation of monitoring wells, remedial wells, perform well development, boring abandonment, and various other drilling tasks as needed). This task shall include the scheduling of field activities associated with the drilling event. This task shall include scheduling and coordinating of underground utility location services. This task shall also include all personnel time necessary to acquire all well permits from the appropriate agency.

Maximum allowable cost is \$417.00 per event/scope of work and is dependent on personnel conducting the work.

3.3.b Cost for mobilization/demobilization of drill rig

This task will include mobilization and demobilization of the drill rig, support vehicles, steam cleaner, grout plant, trailers, and crew to and from the site. Mobilization/demobilization is not to exceed 500 miles round trip.

Direct push unit: A minimum of 100 miles roundtrip is allowed for each event/scope or work. **Maximum roundtrip mileage is 500 miles and cost is limited to 4.5 x IRS Business Standard Mileage Rate .**

Auger and air rotary type drilling rig: A minimum of 100 miles roundtrip is allowed for each event/scope of work. **Maximum roundtrip mileage is 500 miles and cost is limited to 9 x IRS Business Standard Mileage Rate.**

3.3.c Cost for supervision of field work

This task will include oversight of field activities as well as office support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. Cost includes all personnel time and equipment/supplies/portable field instruments. Included in the task, the CAC is required to complete all boring logs, well construction records, and collect all necessary soil samples including samples for soil disposal. Supervisory time should not exceed drilling time.

Maximum allowable cost (personnel and equipment) per day is \$1,279.00 and is dependent on personnel conducting the work.

3.3.d Cost for drilling

This reasonable rate for this task is all inclusive, no additional time, material, equipment, lodging, or per diem will be approved. All monitoring wells shall be installed by a TN licensed well driller. The CAC must submit the drilling invoice with the reimbursement application. The cost of drilling will be reimbursed at cost plus 10% markup not to exceed the reasonable rate schedule. A markup will not be allowed if the CAC uses their own driller.

3.3.e Cost for well development

This task will include all necessary personnel equipment/supplies/portable field instruments to properly develop wells in accordance with the guidelines no sooner than twenty-four (24) hours after installation. A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. **All development records shall be included in an attachment in the applicable report.** All wells are required to be properly developed prior to sampling. This includes surge blocking where needed.

Maximum cost (personnel and equipment) per day is \$1,150.00 and is dependent on personnel conducting the work.

3.3.f RESCINDED, included in task 8.1.a Cost for disposal of petroleum contaminated soil in drums (includes cost of drums)

Task 3.4 Sampling

3.4.a Cost for groundwater sampling

This task is no longer lump sum, the current rate structure includes all personnel time to collect static fluid level measurements, calculate purge volumes, purge wells of any depth or diameter, sample wells, and sampling of purge water for disposal. This task also includes personnel time to coordinate this task and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum

of 2 hours per well is allowed unless justification is provided and approved prior to field activities. Does not include drum costs. Note: all field gauging, purging, and sample collection records shall be included in an attachment in the applicable report.

Project management time is limited to \$417.00 per event/scope of work and is dependent on personnel overseeing the work.

Maximum cost of field activities per day is limited to \$820.00 plus the cost of the 0.45-micron filter, if applicable.

3.4.b Cost for water supply well sampling

This task is no longer lump sum, the current rate structure includes all personnel and equipment/supplies/portable field instruments to purge and sample a water supply well (i.e., indoor or outdoor spigot). This task includes well purging by letting spigot run for an adequate time followed by water supply sampling and purge water sampling for disposal. This task includes the time to coordinate this work and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. All field sample collection records shall be included in an attachment in the applicable report.

Maximum cost of \$200.00 for one (1) well, each additional well sampled includes time only.

3.4.c Cost for surface water sampling

This task is no longer lump sum, the current rate structure includes sampling of various types of surface waters (i.e., includes ponds, streams, creeks, etc.) to verify contamination. This task includes all necessary personnel and equipment/supplies/portable field instruments to perform sampling. This task includes personnel time to coordinate this task and to manage

the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum of 2 hours per sample point is allowed unless justification is provided and approved prior to field activities. All field sample collection records shall be included in an attachment in the applicable report.

Maximum cost of \$200.00 for one (1) sample point, each additional sample point is time only.

3.4.d Cost for soil sampling (not associated with drilling activities)

This task is no longer lump sum, the current rate structure includes various types of soil sampling not associated with drilling activities, closure activities, stockpile sampling or over-excavation sampling. (i.e., includes surface sampling, etc.) to verify contamination. This task includes all necessary personnel and equipment/supplies/portable field instruments to perform sampling. This task includes personnel time to coordinate this work and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing).

Maximum cost (personnel and equipment) of \$989.00 per day.

3.4.e Cost for laboratory services

This task includes laboratory costs associated with all sampling of soil and/or water. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Maximum cost shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

- 3.4.f RESCINDED, included in task 8.1.a Cost for disposal of free product and/or groundwater contaminated with petroleum product (includes cost of drum)

3.4.g Cost for collection of thirty (30) day static groundwater levels

This task includes all personnel and equipment/supplies/portable field instruments to properly collect thirty (30) day static groundwater level measurements in accordance with the current guidance. In the event more than 12 wells will be gauged, then 15 minutes per well can be added to the three hours.

Maximum cost (personnel and equipment) is \$275.00.

Task 3.5 Receptor and Water Use Survey

3.5.a Cost for receptor survey

This task includes preparation of a receptor survey in accordance with the guidelines. This task includes all field work, telephone contacts and records search. This task includes the completion of the Water Use Survey Sheets. **This task is not repeatable unless requested/approved by the Division.**

Maximum cost is \$441.00 and is dependent on personnel conducting the work.

3.5.b Cost for water use and Karst survey

This task includes preparation of a water use and Karst survey in accordance with the guidelines. This task includes all field work, telephone contacts and record searches. This task includes the completion of the Water Use Survey Sheets. **This task is not repeatable unless requested/approved by the Division.**

Maximum cost is \$1,169.00 and is dependent on personnel conducting the work.

Task 3.6 Site Survey

3.6.a Cost for site survey by a licensed professional surveyor

This task will include all personnel time to coordinate and schedule field activities associated with the survey event, and equipment to collect, and record all data required to complete an acceptable monitoring well location map. This task shall include surveying the elevation of the established and documented point on the top of each well casing correlated with a mean sea level datum.

This is a lump sum task with a maximum cost (personnel and equipment) of \$1,246.00 for the initial four (4) wells and \$212.00 for each additional well.

Task 3.7 Vapor Monitoring

3.7.a Cost for vapor monitoring

This task includes monitoring of various types of aboveground and subsurface structures (i.e. buildings, basements, crawl spaces, utility vaults, etc.) for petroleum vapors. This task includes personnel and equipment/supplies/portable field instruments to coordinate and conduct this work. This task should be performed in conjunction with any monitoring or sampling task when personnel are already onsite and not performed as a separate event, unless otherwise directed by the Division.

Maximum cost (personnel and equipment) is \$200.00 per day.

Task 3.8 Soil Gas Survey

Task 3.8.a Soil Gas Survey Using Direct Push Technology

3.8.a.1 Cost for scheduling soil gas survey event

This task will include all necessary contracting and scheduling to perform all phases of the soil gas survey (i.e., soil borings and various other drilling tasks as needed). This task will include the scheduling of field activities associated with the soil gas survey event. This task shall include scheduling and coordinating of underground utility location services.

Maximum allowable cost is \$417.00 and is dependent on personnel conducting the work.

3.8.a.2 Cost for mobilization/demobilization of direct push technology

This task will include mobilization and demobilization of the drill rig, support vehicles, steam cleaner, grout plant, trailers, and crew to and from the site. Mobilization/demobilization is not to exceed 500 miles round trip.

A minimum of 100 miles roundtrip is allowed for each event/scope or work. **Maximum cost is limited to 4.5 x IRS Business Standard Mileage Rate.**

3.8.a.3 Cost for supervision of field work using a direct push technology $\leq$ 4 sample points

This task will include oversight of field activities as well as office support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. Included in the task the CAC is required to complete all field forms and collect all necessary samples. Supervisory time should not exceed drilling time. Use of direct push technology for soil gas survey should be limited to points at a depth of 10 ft, unless justified.

Maximum allowable cost (personnel and equipment) is \$1,916.00.

3.8.a.4 Cost for supervision of field work using a direct push technology for 5-8 sample points

This task will include oversight of field activities as well as office support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. Cost includes all personnel time, sample train, assembly and testing of sample train and sample supplies. Included in the task the CAC is required to complete all field forms and collect all necessary samples. Supervisory time should not exceed drilling time. Use of direct push technology for soil gas survey should be limited to points at a depth of 10 ft, unless justified.

Maximum allowable cost (personnel and equipment) for eight (8) sample points is \$2,540.00

3.8.a.5 Cost for drilling using direct push technology $\leq$ 4 sample points

This task will include support vehicles, steam cleaner, trailers, bentonite, and a two (2) person crew. The CAC must submit the drilling invoice with the reimbursement application.

The cost of drilling will be reimbursed at cost plus 10% markup not to exceed the reasonable rate schedule. A markup will not be allowed if the CAC uses their own driller. Use of direct push technology for soil gas survey should be limited to points at a depth of 10 ft, unless justified.

***Minimum cost for Direct Push Rig and associated drilling equipment is \$3,110.00.**

3.8.a.6 Cost for drilling using direct push technology 5-8 sample points

This task will include support vehicles, steam cleaner, trailers, bentonite, and a two (2) person crew. The CAC must submit the drilling invoice with the reimbursement application.

The cost of drilling will be reimbursed at cost plus 10% markup not to exceed the reasonable rate schedule. A markup will not be allowed if the CAC uses their own driller. Use of direct push technology for soil gas survey should be limited to points at a depth of 10 ft, unless justified.

***Minimum cost for Direct Push Rig and associated drilling equipment is \$3,220.00.**

3.8.a.7 Cost for laboratory services

This task includes laboratory costs associated with all air or soil gas sampling. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Task 3.8 Soil Gas Survey

Task 3.8.b Soil Gas Survey Using Hammer Drill or Slide Hammer

3.8.b.1 Cost for scheduling soil gas survey event

This task will include all necessary contracting and scheduling to perform all phases of the soil gas survey (i.e., soil borings and various other drilling tasks as needed). This task will include the scheduling of field activities associated with the soil gas survey event. This task will include locating all underground utilities.

Maximum allowable cost is \$417.00 and is dependent on personnel conducting the work.

3.8.b.2 Cost for field work using a hammer drill or slide hammer ≤ 4 sample points

This task will include oversight of field activities as well as office and field support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. Cost includes all personnel time, sample train, assembly and testing of sample train and sample supplies. Included in the task, the CAC is required to complete all field forms and collect all necessary samples.

Maximum Allowable cost (personnel and equipment) is \$2,938.00 and is dependent on personnel conducting the work.

3.8.b.3 Cost for field work using a hammer drill or slide hammer 5-8 sample points

This task will include oversight of field activities as well as office and field support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. Cost includes all personnel time, sample train, assembly and testing of sample train and sample supplies. Included in the task, the CAC is required to complete all field forms and collect all necessary samples.

Maximum Allowable cost is \$4,959.00 and is dependent on personnel conducting the work.

3.8.b.4 Cost for laboratory services

This task includes laboratory costs associated with all air or soil gas sampling. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Task 3.9 Advanced Site Characterization

Task 3.9.a Advanced Site Characterization Technologies

3.9.a.1 Cost for scheduling approved site characterization technologies

This task will include all necessary contracting and scheduling to perform all phases of approved site characterization technologies. This task shall include the scheduling of field activities associated with the approved site characterization technologies. This task includes having the Tennessee 811 Call (TN One Call) locate all underground utilities. This task shall also include all personnel time necessary to acquire any required permits from the appropriate agency.

Maximum allowable cost is \$417.00 and is dependent on personnel conducting the work.

3.9.a.2 Cost for private utility location

This task will include the cost equal to the cost of the approved bid and change orders if applicable, submitted to the Division and approved in writing. Three bids are required, and the lowest bid is to be chosen unless approved by the Division in writing. Only one private utility location is allowed for each release unless approved by the Division in writing.

Maximum cost is equal to the cost of the bid, and change orders if applicable, plus a 10% markup, submitted to the Division and approved in writing.

3.9.a.3 RESCINDED, included in task 3.9.a.5 Cost for mobilization / demobilization of drill rig

3.9.a.4 RESCINDED, included in task 3.9.a.6 Cost for drilling

3.9.a.5 Cost for mobilization/demobilization of approved advanced site characterization technologies equipment

This task will include mobilization and demobilization of advanced site characterization technologies equipment to and from the site. The cost is equal to the cost of the approved bid and change orders if applicable, submitted to the Division and approved in writing.

Maximum cost is equal to the cost of the bid, and change orders if applicable, submitted to the Division and approved in writing. No markup will be reimbursed.

3.9.a.6 Cost to conduct advanced site characterization technologies

This task will include the cost to conduct approved advanced site characterization technologies.

Maximum cost is equal to the cost of the bid, and change orders if applicable, plus a 5% markup, submitted to the Division and approved in writing.

3.9.a.7 Cost for supervision of advanced site characterization technologies

This task will include oversight of field activities as well as office support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic

experience, and the necessary equipment to supervise and manage drilling activities. Supervisory time should not exceed drilling time.

Maximum allowable cost per day is \$1,179.00 and is dependent on personnel conducting the work.

3.9.a.8 Cost of supervision of drilling/sampling

This task will include oversight of field activities as well as office support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. Cost includes all personnel time, equipment, and supplies. Included in the task, the CAC is required to complete all boring logs, well construction records, and collect all necessary soil samples including samples for soil disposal. Supervisory time should not exceed drilling time.

Maximum allowable cost (personnel and equipment) per day is \$1,279.00 and is dependent on personnel conducting the work.

3.9.a.9 Cost for well development

This task will include all necessary personnel (TN licensed geologist, TN licensed engineer, senior environmental specialist, environmental specialist, or senior technician), labor, equipment and supplies to properly develop wells in accordance with the guidelines twenty-four (24) hours after installation. A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. All development records shall be included in an attachment in the applicable report. All wells are required to be properly developed prior to sampling. This includes surge blocking where needed.

Maximum cost (personnel and equipment) per day is \$1,150.00 and is dependent on personnel conducting the work.

3.9.a.10 Cost for groundwater sampling

This task is no longer lump sum, the current rate structure includes all personnel time to collect static water level measurements, calculate purge volumes, purge wells of any depth or diameter, sample wells and sample of purge water for disposal. This task also includes personnel time to coordinate this task and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. Does not include drum costs. All field sample collection records shall be included in an attachment in the applicable report.

Project management time is limited to \$417.00 per event/scope of work and is dependent on personnel overseeing the work.

Maximum cost (personnel and equipment) of field activities per day is limited to \$820.00 plus the cost of the 0.45-micron filter, if applicable.

3.9.a.11 Cost of soil/groundwater sampling laboratory services

This task includes laboratory costs associated with soil/groundwater sampling. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Maximum cost shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

3.9.a.12 RESCINDED, included in task 8.1.a Cost for disposal of petroleum contaminated soil/water in drums

4.0 RISK MANAGEMENT AND CORRECTIVE ACTION PROCESS

Task 4.1 Risk Reduction

4.1.a Cost for risk reduction implementation

This task will include the cost of the bid, and change order(s) if applicable, approved in writing by the Division.

Maximum cost is equal to the cost of the bid, and change orders if applicable, submitted to the Division and approved in writing.

4.1.b Cost for disconnection of private water supply well

This task will include all necessary personnel and labor, equipment, and materials to properly disconnect a private water supply well. Required activities include, but are not limited to, termination and disconnection of the power supply and disconnection and capping of any associated piping from the well to the building.

Maximum cost is equal to the cost of the bid, plus 10% markup and change orders if applicable, submitted to the Division and approved in writing.

4.1.c Cost for supervision of private water supply well abandonment

This task includes all necessary personnel time to properly abandon a private water supply well in accordance with the Water Well Licensing Regulations and Well Construction Standards Rule 400-45-09-.16. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-*

101 et seq.), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (T.C.A. §62-2-101 et seq.) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. This task includes field activities and supervision, project scheduling and oversight.

Maximum cost is \$1,040.00 per day and is dependent on personnel conducting the work.

4.1.d Cost for private water supply well abandonment

This task includes the proper abandonment of a private water supply well performed by a licensed well driller in accordance with the Water Well Licensing Regulations and Well Construction Standards Rule 400-45-09-.16. All private water supply wells shall be installed and abandoned by a licensed well driller. The CAC must submit the drilling invoice with the reimbursement application.

The cost of well abandonment will be reimbursed at cost plus 10% markup not to exceed the reasonable rate schedule. A markup will not be allowed if the CAC uses their own driller.

Maximum cost is equal to the cost of the bid, and change orders if applicable, submitted to the Division and approved in writing.

Task 4.2 Institutional Controls

4.2.a Cost for institutional control implementation

Maximum cost is equal to the cost of the bid, and change orders if applicable, submitted to the Division and approved in writing.

Task 4.3 Engineering Controls

4.3.a Cost for engineering control implementation

Maximum cost is equal to the cost of the bid, plus 5% markup, and change orders if applicable, submitted to the Division and approved in writing.

4.0 RISK MANAGEMENT AND CORRECTIVE ACTION PROCESS

Task 4.4 Corrective Action

Task 4.4.a Corrective Action System Installation

4.4.a.1 Cost for public notice advertisement

This task includes all personnel time and charges associated with placing public notice of impending corrective action in the newspaper, the state register, sending certified letters to property owners, and/or personal contacts.

Personnel time is limited to \$147.00 and is dependent on personnel conducting the work. Maximum cost is limited to the actual amount of advertisement or postage cost plus personnel time.

4.4.a.2 Cost for permit and/or utility service

This task includes all personnel time necessary to secure permits and/or utility connections with federal, state, and/or local government agency requirements.

Maximum cost is \$251.00 and is dependent on personnel conducting the work.

4.4.a.3 Cost for oversight of corrective action system delivery

This task includes all personnel time to coordinate, schedule and oversee delivery of the corrective action system. Cost includes crane rental with operator or forklift for off-loading.

A crane is preferred, but if not feasible, a forklift is permitted (either/or, but not both, only one can be claimed for reimbursement).

Maximum cost (personnel and equipment) is \$1,846.00 and is dependent on personnel conducting the work.

4.4.a.4 Cost for soil excavation and soil source removal

This task will include all personnel, equipment and supplies to complete soil excavation and source removal in accordance with an approved Corrective Action Plan.

Maximum cost is equal to the cost of the proposal and any modifications made by the Division, and change orders if applicable, submitted to the Division in the CAP and approved in writing.

4.4.a.5 Cost for recovery well trench installation

This task will include all personnel time, equipment, and supplies, to complete recovery well trenching in accordance with the [section VI.N](#) Corrective Action Plan of the Guidance Manual and applicable TDEC CAS Figure Package, on a per foot basis.

Maximum cost for recovery well trench installation, including piping and fittings, is \$90.00 or \$100.00 / linear foot depending on the number of lines in the recovery trench.

4.4.a.6 Cost for recovery wellhead manifold, extraction vault and tubing installation

This task will include all personnel, equipment and supplies to construct and install recovery well heads and vaults for each recovery well in accordance with an approved Corrective Action Plan.

This is a lump sum task with a maximum cost of \$1,626.00/wellhead.

4.4.a.7 Cost for corrective action system inlet piping manifold

This task will include all personnel, equipment and supplies to construct and install the corrective action system inlet piping manifold in accordance with an approved Corrective Action Plan. This includes any personnel time (not travel time or mileage) required to purchase necessary supplies.

This is a lump sum task with a maximum cost for the first extraction well connection of \$463.00. and a maximum cost for each additional extraction well/contingent line connection of \$140.00.

4.4.a.8 Cost for concrete pad and bollard installation

This task includes all personnel, equipment and supplies to properly construct and pour the below applicable concrete pad dimensions in accordance with the current Corrective Action Plan Guidelines CAS Figure Packages:

- a. 40 hp CAS concrete pad dimensions - ten (10) feet wide by fourteen (14) feet long by four (4) inches thick. Maximum allowed total cost is \$2,700.00.
- b. 50 hp CAS concrete pad dimensions - ten (10) feet wide by eighteen (18) feet long by four (4) inches thick. Maximum allowed total cost is \$3,275.00.

This task includes 4500 PSI concrete. It also includes personnel, equipment and supplies to construct and install the bollards for the corrective action system (up to 12 bollards maximum). This should be performed in conjunction with concrete pad installation or any corrective action installation task when personnel are already on site and not performed as a separate event, unless otherwise directed by the Division.

This is a lump sum task with a maximum cost of \$2,700.00 or \$3,275.00 (dependent on pad size) per pad installation. Maximum cost for bollard installations is \$253.00 each up to \$3,036.00 for 12.

4.4.a.9 Cost for mobilization/demobilization of heavy equipment

This task will include mobilization and demobilization of any heavy equipment to and from the site for excavation and corrective action system off-loading from the delivery truck.

Category 1 equipment is at cost not to exceed \$500.00, if over \$500.00 then requires submission of 3 bids and prior Division approval.

Category 2 equipment is at cost not to exceed \$1,000.00, if over \$1,000.00 then requires submission of 3 bids and prior Division approval.

No markup will be reimbursed.

4.4.a.10 Cost for corrective action system discharge trench installation

This task will include all personnel time, equipment, and supplies, to complete CAS discharge piping and trenching in accordance with an approved Corrective Action Plan, on a per foot basis.

Maximum cost for discharge trench installation, including piping and fittings, is either \$26 or \$33 / linear foot.

4.4.a.11 Cost for wet test of system

This task will include personnel and level 2 equipment to ensure that 500 gallons of potable water are at the site so that the corrective action system may be properly wet tested after delivery and prior to start-up. These activities include, but are not limited to pre-diagnostic

testing, electrical connections, hydrating the carbon filters, and CAS troubleshooting. This is a one-time cost unless otherwise approved by the Division and includes completing the manufacturer pre-startup checklist.

Maximum cost (personnel and equipment) is \$1,828.00 per wet test and is dependent on personnel conducting the work.

4.4.a.12 Cost for electrical service installation

This task will include the cost of the bid by the electric service provider, for a licensed electrician to make final connections, and change order(s) if applicable, approved in writing by the Division.

This task will include the cost of the bid, and change order(s) if applicable, approved in writing by the Division.

4.4.a.13 Cost for disposal of CAS site debris

This task will include the cost for the proper disposal of non-contaminated materials that must be removed from the site during installation of the CAS and associated trenching (4.4.a.5 through 4.4.a.8 and 4.4.a.10). This includes asphalt, concrete/rebar, scrap trench piping but does not include disposal of petroleum contaminated soils or gravel. This task should also be used for disposal costs associated with 4.4.d.9.

Maximum cost is equal to the cost of the bid, and change orders if applicable, submitted to the Division and approved in writing.

4.0 RISK MANAGEMENT AND CORRECTIVE ACTION PROCESS

Task 4.4 Corrective Action

Task 4.4.b Corrective Action System Operation and Maintenance**4.4.b.1 Cost for routine operation and maintenance**

This task will include routine, scheduled site visits. This is limited to one (1) visit per month. If additional visits are required, a request in advance must be made and approved by the Division project manager. Onsite personnel shall perform routine and scheduled repairs during the site visit. Onsite personnel shall inspect and document system performance on Division provided field forms (CASFL) including, but not limited to, tabulating gauge and meter readings, inspecting for and repairing leaks (including removing any standing water/product/oil), noting excessive equipment heat and noise, and equipment wear. Other routine activities may include but are not necessarily limited to: adjusting the system for summer or winter operation, checking extraction wells, depth to water and/or adjusting stinger well depths to maximize free product/contaminant recovery; checking all wells (extraction and monitoring) not connected to or in use by the CAS that have contained free product in the past and removing any free product; checking down-hole pumps or air assist lines, if applicable; checking/changing filters, hoses, oil; cleaning the stripper and oil/water separator inside utilizing Rydlyme to remove sludge/fouling/mineral build-up; inspecting and cleaning the stripper aeration tubes/lid seal (gasket roll)/packing media and replacing if necessary and cleaning the stripper exterior; cleaning the AWS inside to remove sludge/fouling/mineral build-up and cleaning the exterior; cleaning the exterior of the heat exchanger; checking all transfer pumps for signs of mineral deposits and cleaning if needed; checking and cleaning the conductivity level probe rods in the AWS and sump; checking the oil sight gauge for water or cloudiness, draining if necessary, and throttling the oil to raise the temperature; cleaning the bag filter housings inside and out to remove sludge/fouling/mineral build-up; backwashing GAC vessels to remove sludge/fouling/mineral build-up and cleaning the exterior; repairing/replacing gauges; and applying lubricants as needed. All components and equipment shall be operated, maintained, and cleaned in accordance with the manufacturers' O&M manual and Division requirements, which include quarterly O&M requirements, when applicable. The maximum cost includes all personnel and equipment/supplies/portable field instruments

to service and maintain the system equipment. Price does not include major repairs or extensive troubleshooting which may be covered by the manufacturer. Office coordination and scheduling time is included in the daily rate. Routine operation and maintenance shall not exceed one (1) workday (maximum 10-hour workday) without prior approval from the Division project manager. In the month that Annual O&M is performed, monthly O&M should not be performed. **Level 2 equipment is applicable when only backflushing carbons and changing bag filters (i.e. other major components are not cleaned). Level 3 equipment is applicable when major components are cleaned. To receive reimbursement for Level 3, photographic documentation with date and time stamp of before and after of major components cleaned are required in both the reimbursement application and associated monitoring report. Level 1 through Level 3 equipment, supplies, and portable field instruments are on a per day basis and not per task. Justification and approval shall be obtained prior to field activities for variance and/or more than one level per day (i.e. this will be an exception and not routinely necessary).**

Maximum cost (personnel and equipment) is \$1,517.00 per day and is dependent on personnel conducting the work. All routine O&M conducted on a state-owned system shall be performed by a CAS Specialist.

4.4.b.2 Cost for non-scheduled maintenance

This task will include a nonscheduled site visit as a result of a system shutdown or failure that cannot be restarted remotely. This task includes all personnel and equipment to perform the tasks, troubleshooting, and repairing of the system and completing the Division provided field forms (CASRL and/or CASDR). A Corrective Active System Field Log (CASFL) should also be completed for each site visit if the system is operating before departure from the site. Office coordination and scheduling time is included in the daily price rate. Only the actual time spent onsite for the CAS Specialist is to be reimbursed. This task will only be reimbursed if the Division project manager is notified no later than one (1) working day after any non-routine field activity after the system shutdown or failure. **Level**

2 equipment is applicable when only backflushing carbons and changing bag filters (i.e. other major components are not cleaned). Level 1 through Level 3 equipment are on a per day basis and not per task. Justification and approval shall be obtained prior to field activities for variance and/or more than one level per day (i.e. this will be an exception and not routinely necessary).

Maximum cost (personnel and equipment) is \$1,321.00 per day and is dependent on personnel conducting the work. All non-scheduled O&M conducted on a state-owned system shall be performed by a CAS Specialist.

4.4.b.3 Cost for evaluation of performance meeting

This task will include the meeting held between Division personnel, the CAC and/or the responsible party, as deemed necessary by the Division to evaluate the performance of the CAS. Topics for discussion shall include but not be limited to COC concentration reduction, plume dynamics, system operational performance, system repair history, and recommendations for system and/or CAP modifications to increase system performance. This may include any time for a meeting that may be conducted onsite, at a local field office, or virtually. Maximum cost includes the time required for oversight by the Project Manager and a staff level person to schedule and compile aforementioned information in a suitable format to present/review during the meeting. Time includes the meeting itself.

Maximum cost is \$2,152.00 per meeting and is dependent on personnel conducting the work.

4.4.b.4 Cost for utilities and payment of bills

This task includes all personnel time necessary to process and pay bills associated with utility connection and CAS usage including electric, natural gas, , sanitary sewer (POTW), and water. This task shall be billed in conjunction with 4.4.b.5.

Maximum cost is \$86.00 per month.

4.4.b.5 Cost for charges for utility service

This task includes all costs for utility service necessary to operate an approved CAS including electric, natural gas, sanitary sewer (POTW), and water usage. This task shall be billed in conjunction with 4.4.b.4.

Maximum cost is limited to the actual amount of the utility bill.

4.4.b.6 Cost for additional technician during operation and/or maintenance

This task will include all personnel time necessary for an additional technician to assist with operation and/or maintenance as described in tasks 4.4.b.1 and 4.4.b.2. **This task must be requested in advance and approved by the Division project manager.** Operation and/or maintenance shall not exceed one (1) workday (maximum 10-hour workday) without prior approval from the Division project manager. This is limited to one (1) visit per month. If additional visits are required, then they must be requested in advance and approved by the Division project manager.

Maximum cost is \$600.00 per day.

4.4.b.7 Cost for review of telemetry report

This task includes all personnel time necessary to review and interpret all telemetry alarms, data and reports associated with the CAS. This includes remotely starting the CAS, when necessary.

Maximum cost is \$278.00 per month and is dependent on personnel conducting the work.

4.4.b.8 Cost for annual routine operation and maintenance

This task will include a routine scheduled site visit for annual operation and maintenance as outlined in the manufacturers' operating manual. This task is limited to one (1) workday per twelve (12) month period and shall not exceed one (1) workday (maximum 10-hour workday) without prior approval from the Division project manager. The maximum cost includes all personnel and equipment to service and maintain the system equipment and completion of all tasks and paperwork required by the Division's CASFL. Price does not include major repairs or extensive troubleshooting which may be covered by the manufacturer. Office coordination and scheduling time is included in the daily rate. All annual routine O&M conducted on a state owned system shall be performed by a CAS Specialist and technician. A separate routine O&M event during the same month will not be reimbursed. **Level 2 equipment is applicable when only backflushing carbons and changing bag filters (i.e. other major components are not cleaned). Level 3 equipment is applicable when major components are cleaned. To receive reimbursement for Level 3, photographic documentation with date and time stamp of before and after of major components cleaned are required in both the reimbursement application and associated monitoring report. Level 1 through Level 3 equipment are on a per day basis and not per task. Justification and approval shall be obtained prior to field activities for variance and/or more than one level per day (i.e. this will be an exception and not routinely necessary)**

Maximum cost (personnel and equipment) is \$2,181.00 per day and is dependent on personnel conducting the work. The cost of the annual O&M kit from the system manufacturer is at cost plus a 10% markup and shipping.

4.0 RISK MANAGEMENT AND CORRECTIVE ACTION PROCESS

Task 4.4 Corrective Action

Task 4.4.c Corrective Action Sampling

4.4.c.1 Cost for groundwater sampling

This task is no longer lump sum, the rate structure includes all personnel time to collect static water level measurements, calculate purge volumes, purge wells of any depth or diameter, sample wells, and sample purge water for disposal. This task also includes personnel time to coordinate this task and to manage the laboratory services (i.e., chain of custody, sample preparation, sample QA/QC, and invoice managing). The schedule for groundwater monitoring shall be performed in accordance with the schedule in the approved CAP. Wells to be sampled shall be in accordance with the approved CAP. A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. Does not include drum costs. Note: all gauging, purging, and field sample collection records shall be included in an attachment in the applicable report.

Project management time is limited to \$417.00 per event/scope of work and is dependent on personnel overseeing the work.

Maximum cost (personnel and equipment) of field activities per day is limited to \$820.00 plus the cost of the 0.45-micron filter, if applicable.

4.4.c.2 Cost for water supply well sampling

This task is no longer lump sum, the current rate structure includes all personnel and equipment to purge and sample a water supply well and sample purge water for disposal. The water supply well is to be purged by running water through a spigot for an adequate time prior to sampling. This task also includes personnel time to coordinate this work and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. Note: all field sample

collection records shall be included in an attachment in the applicable report.

Maximum cost of \$200.00 for one (1) well, each additional well sampled includes time only.

4.4.c.3 Cost for surface water sampling

This task is no longer lump sum, the current rate structure includes sampling of various types of surface waters (i.e., includes ponds, streams, creeks, etc.) to verify contamination. This task includes all necessary personnel and equipment to perform sampling. This task also includes personnel time to coordinate this work and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum of 2 hours per sample point is allowed unless justification is provided and approved prior to field activities. Note: all field sample collection records shall be included in an attachment in the applicable report.

Maximum cost of \$200.00 for one (1) sample point, each additional sample point is time only.

4.4.c.4 Cost for soil sampling (not associated with drilling activities)

This task is no longer lump sum, the current rate structure includes various types of soil sampling not associated with drilling activities, closure activities, stockpile sampling or over-excavation sampling (i.e., includes surface sampling, etc.) to verify contamination. This task includes all necessary personnel and equipment to perform sampling. This task also includes personnel time to coordinate this work and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing).

Maximum cost (personnel and equipment) of \$989.00 per day.

4.4.c.5 Cost for laboratory services

This task will include any soil laboratory analysis performed for corrective action monitoring. The CAC must submit the laboratory invoice and completed chain of custody form with the reimbursement application. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Maximum costs shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

4.4.c.6 Cost for monitored natural attenuation

This task includes the collection of geochemical and/or biological samples and evaluation of parameters that support intrinsic remediation including, but not limited to, dissolved oxygen, nitrate, sulfate, total dissolved iron, methane, and total organic carbon. Sampling and laboratory analysis for the appropriate COCs shall also be a part of this task. This task also includes personnel time to coordinate this work and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing).

Maximum cost is equal to the cost of the bid, and change orders if applicable, submitted to the Division and approved in writing.

4.4.c.7 Cost for land and receptor monitoring

This task shall consist of monitoring for changes in land, surface, and/or groundwater use surrounding the site. Compare receptors used during preparation of the approved RAR to any changes observed on site or surrounding the site. This task should be performed in conjunction with any monitoring or sampling task when applicable personnel are already on site. **Limited to the frequency approved in the CAP, Division's preference is once**

per year.

Maximum cost is \$347.00 and is dependent on personnel conducting the work.

4.4.c.8 (RESCINDED should be conducted during 4.4.b.1 activities, no additional time will be added) Cost for Publicly Owned Treatment Works (POTW) sampling

4.4.c.9 (RESCINDED should be conducted during 4.4.b.1 activities, no additional time will be added) Cost for National Pollutant Discharge Elimination System (NPDES) sampling

4.4.c.10 Cost for effluent toxicity sampling (NPDES)

This task includes all personnel time and equipment required to conduct whole effluent toxicity sampling over a five (5) day period. Personnel are allotted a maximum of two (2) hours onsite time per day on days one (1), three (3) and five (5) to collect grab samples from the CAS effluent. Level 1 equipment for this task is on a per task basis, and not per day.

Also includes personnel time to schedule and coordinate task. Maximum cost (personnel and equipment) is \$567.00 for each sample collection event, total of 3.

4.4.c.11 RESCINDED, included in task 4.4.b.1 (no additional time added) Cost for corrective action system air monitoring

4.4.c.12 RESCINDED, included in task 8.1.a Cost for disposal of drums filled with free product or groundwater contaminated with petroleum product

4.4.c.13 RESCINDED, included in task 8.1.a Cost for disposal of drums filled with petroleum contaminated soil

4.4.c.14 Cost for vacuum monitoring of CAS

This task includes all personnel time and equipment required to obtain and document vacuum measurements collected during each monitoring event as specified in the CAP. All vacuum measurements shall be documented in the CASFL as well as the applicable table(s) in the associated report. This task should be performed in conjunction with any monitoring task when personnel are already on site. Note: all field notes shall be included in an attachment in the applicable report.

Maximum cost is \$150.00.

4.0 RISK MANAGEMENT AND CORRECTIVE ACTION PROCESS**Task 4.4 Corrective Action****Task 4.4.d Corrective Action System Closure****4.4.d.1 Cost for deactivation of corrective action system**

This task includes all personnel time and equipment required to properly deactivate a CAS in accordance with the current Division Corrective Action System Deactivation Checklist, manufacturer's recommendations, and/or local, state, and federal laws and guidelines. Office coordination and scheduling time is included in the daily rate. **To receive reimbursement for Level 3 equipment, photographic documentation with date and time stamp of before and after of major components cleaned are required in both the reimbursement application and associated monitoring report. Level 3 equipment for this task is on a per task basis, and not per day.**

Maximum cost (personnel and equipment) is \$3,439.00 and is dependent on personnel conducting the work.

4.4.d.2 RESCINDED, included in task 8.1.a Cost for disposal of drums filled with free product and/or groundwater

4.4.d.3 Cost for permit and/or utility connection termination

This task includes all personnel time necessary to terminate permits and/or utility connections with federal, state, and/or local government agency requirements.

Maximum cost is \$208.00 for oversight and is dependent on personnel conducting the work.

Maximum cost for subcontracted electrician (if required by utility district) not to exceed the cost of the bid submitted to the Division and approved in writing, plus 5% markup, and change order(s) if applicable.

4.4.d.4 Cost for preparation of the corrective action system for removal from the site

This task includes all personnel time and equipment required to properly sever tie downs, piping, and electrical wiring from the corrective action system, and to remove unusable power poles, exposed piping, fencing and enclosures in accordance with the current local, state, and federal laws and guidelines. This cost also includes oversight during the loading of the corrective action system and associated equipment for transport.

Maximum cost not to exceed \$510.00.

4.4.d.5 Cost for decommissioning a corrective action system

This task includes the personnel time and equipment required to properly decommission a CAS including dismantling any associated ancillary equipment, removing unusable power poles, exposed piping, fencing and enclosures in accordance with the current Division Corrective Action System Decommission Checklist and local, state, and federal laws and

guidelines. This includes properly preparing the system for removal from the site. Office coordination and scheduling time is included in the daily rate. All state-owned equipment pick-up will be scheduled by the Division.

Maximum cost is (personnel and equipment) not to exceed \$1,539.00. This task must be approved in writing from the Division project manager.

4.4.d.6 Cost for mobilization and demobilization of heavy equipment

This task will include mobilization and demobilization of the backhoe and/or skid-steer loader and concrete breaker to and from the site for decommissioning or following removal of CAS.

Category 1 equipment is at cost not to exceed \$500.00, if over \$500.00 then requires submission of 3 bids and prior Division approval.

Category 2 equipment is at cost not to exceed \$1,000.00, if over \$1,000.00 then requires submission of 3 bids and prior Division approval.

No markup will be reimbursed.

4.4.d.7 Cost for oversight of the corrective action system pick-up by the state contractor

This task includes all personnel for oversight by the state contractor of pick-up and loading of the corrective action system for transport. This cost also includes inspection to determine that all tie downs have been properly severed and piping and wiring have been properly disconnected and capped from the CAS. **This task will only be reimbursed if requested/approved by the Division.**

Maximum cost is not to exceed \$450.00.

4.4.d.8 Cost for reactivation of the corrective action system and oversight of performance (with Division approval)

This task includes all personnel time and equipment required to properly reactivate the CAS after Division approval and in accordance with the current Division Corrective Action System Reactivation Checklist. This task includes maximum on-site allowable personnel time up to 10 hours to make any necessary system adjustments. Office coordination and scheduling time is included in this task.

Maximum cost (personnel and equipment) is \$1,639.00.

4.4.d.9 Cost for removal of the concrete pad for a state owned corrective action system (if required by property owner)

This task is to be conducted at the request of the property owner (written documentation required) and in conjunction with Tasks 4.4.d.7 or 5.2.c (travel time, mileage, lodging and per diem costs will not be reimbursed for this task). This task includes all personnel time and equipment required to break up and remove the concrete pad after the corrective action system has been removed from the site for refurbishment. Office coordination and scheduling time is included. This task includes hauling debris to a disposal or recycling facility. This cost does not include the disposal costs. Disposal costs should be requested in task 4.4.a.13.

Maximum cost (personnel and equipment) is not to exceed \$1,799.00.

NOTE: The Division will not reimburse for the hauling and/or disposal of a non-state owned CAS.

4.0 RISK MANAGEMENT AND CORRECTIVE ACTION PROCESS**Task 4.4 Corrective Action**

Task 4.4.e Corrective Action Material Injection/Application**4.4.e.1 Cost for scheduling corrective action material injection/application**

This task will include all necessary contracting and scheduling of a corrective action material injection/application event. This task shall include the scheduling of field activities. This task includes having the Tennessee 811 Call (TN One Call) locate all underground utilities. This task shall also include all personnel time necessary to acquire any required permits from the appropriate agency.

Maximum allowable cost is \$417.00 and is dependent on personnel conducting the work.

4.4.e.2 Cost for private utility location

This task will include the cost equal to the cost of the approved bid and change orders if applicable, submitted to the Division and approved in writing. Three bids are required, and the lowest bid is to be chosen unless approved by the Division in writing. Only one private utility location is allowed for each release unless approved by the Division in writing.

Maximum cost is equal to the cost of the bid, and change orders if applicable, plus a 10% markup, submitted to the Division and approved in writing.

4.4.e.3 (RESINDED included in 4.4.e.5) Cost for mobilization/demobilization of drill rig

4.4.e.4 (RESINDED, included in 4.4.e.6) Cost for drilling

4.4.e.5 Cost for mobilization/demobilization of corrective action materials injection/application equipment.

This task will include mobilization and demobilization of corrective action materials injection/application equipment to and from the site. The cost is equal to the cost of the approved bid and change orders if applicable, submitted to the Division and approved in writing.

Maximum cost is equal to the cost of the bid, and change orders if applicable, submitted to the Division and approved in writing. No markup will be reimbursed.

4.4.e.6 Cost to conduct corrective action materials injection/application

This task will include the cost to conduct corrective action materials injection/application.

Maximum cost is equal to the cost of the bid, and change orders if applicable, plus a 5% markup, submitted to the Division and approved in writing.

4.4.e.7 Cost for supervision of corrective action materials injection/application

This task will include oversight of field activities as well as office support and coordination. This task includes one (1) field person, either a licensed professional geologist under the Tennessee Geologist Licensure Act of 2007 (*T.C.A. §62-36-101 et seq.*), or registered professional engineer under the Tennessee Architects, Engineers, Landscape Architects, and Interior Designers Law and Rules (*T.C.A. §62-2-101 et seq.*) with appropriate geologic experience, and the necessary equipment to supervise and manage drilling activities. Supervisory time should not exceed drilling time.

Maximum allowable cost per day is 1,109.50 and is dependent on personnel conducting the work.

4.4.e.8 Cost for groundwater sampling

This task is no longer lump sum, the current rate structure includes all personnel time to collect static water level measurements, calculate purge volumes, purge wells of any depth or diameter, sample wells, and sample purge water for disposal. This task also includes personnel time to coordinate this work and to manage the laboratory services (i.e., Chain of custody, sample preparation, sample QA/QC, and invoice managing). A maximum of 2 hours per well is allowed unless justification is provided and approved prior to field activities. Does not include drum costs. Note: all gauging, purging, and field sample collection records shall be included in an appendix in the applicable report.

Project management time is limited to \$417.00 per event/scope of work and is dependent on personnel overseeing the work.

Maximum cost of field activities per day is limited to \$820.00, plus the cost of the 0.45-micron filter, if applicable.

4.4.e.9 Cost for laboratory services

This task includes laboratory costs associated with groundwater sampling. CAC must submit the laboratory invoice and completed chain-of-custody form with the reimbursement request. **The cost of laboratory analyses will be reimbursed at cost plus 10% not to exceed the rates listed. A markup will not be allowed if the CAC uses their own lab.**

Maximum cost shall not exceed the reasonable reimbursable rates as determined by the applicable laboratory method established in [Table 1-1 Chemicals of Concern](#).

The cost of shipping samples to/from the supplier/manufacturer is reimbursable.

4.4.e.10 RESCINDED, included in task 8.1.a Cost for disposal of petroleum contaminated soil and/or water in drums

4.0 RISK MANAGEMENT AND CORRECTIVE ACTION PROCESS

Task 4.4 Corrective Action Task

Task 4.4.f Corrective Action Training

4.4.f.1 Cost for Annual CAS Specialist Training

This task will include Annual CAS Specialist Training conducted by the Division's Contracted Corrective Action System Manufacturer. This training shall include but not limited to CAS system O&M, trouble shooting, startup and deactivation, CAS system optimization and system performance. CACs contracted to an open fund covered release are eligible for reimbursement. Maximum cost includes the attendee's maximum hourly rate, travel and per diem costs required to complete the training. Attendees must meet all pre-requisites for CAS Specialist Certification, be present for the entire training course and pass any required testing with a satisfactory result to be eligible for reimbursement.

No markup will be reimbursed.

5.0 FINAL SITE CLOSURE PROCESS

Task 5.1 Well Abandonment

5.1.a Cost for supervision of well abandonment

This task includes all necessary personnel time to properly abandon wells in accordance with the current guidance. This task includes field activities and supervision, project scheduling and oversight.

Maximum cost is \$508.00 per event and is dependent on personnel conducting the work.

5.1.b Cost for well abandonment

This task includes the proper abandonment in accordance with the current guidance and performed by a licensed well driller, including completion of the Division's monitoring well abandonment checklist and taking pictures prior to abandonment and of the final well abandonment. All monitoring wells shall be abandoned by a TN licensed well driller. The CAC must submit the drilling invoice with the reimbursement application. **The cost of well abandonment will be reimbursed at cost plus 10% markup not to exceed the reasonable rate schedule. A markup will not be allowed if the CAC uses their own driller.**

Maximum cost for 2" well abandonment is not to exceed \$16.00 per foot. Maximum cost for 4" well abandonment is not to exceed \$18.00 per foot. Maximum cost for recovery well vault removal is \$400.00 per vault. Maximum cost for manhole covers and well pad removal is \$175.00 per well.

5.1.c Cost for mobilization/demobilization of support truck

This task will include mobilization and demobilization of a support truck (equipped to properly abandon monitoring wells) to and from the site. Mobilization/demobilization is not to exceed 500 miles round trip.

Maximum roundtrip mileage is 500 miles and cost is limited to 2 x IRS Business Standard Mileage Rate.

NOTE: If a drill rig is thought to be required to properly abandon the monitoring wells, then **prior written approval** must be obtained from the Division. Otherwise, the cost will not be considered to be reasonable and will not be reimbursed

5.0 FINAL SITE CLOSURE PROCESS

Task 5.2 Site Restoration

5.2.a Cost for scheduling for site restoration activities

This task will include all necessary contracting and scheduling for site restoration activities.

Maximum cost is \$278.00 per event.

5.2.b Cost for supervision of site restoration

This task will include oversight of field activities as well as office support and coordination.

Maximum cost is \$208.00 per event

5.2.c Site restoration

This task will include all personnel and labor, equipment and supplies to properly restore the site to a condition comparable to the original condition utilizing seed, mulch, and straw by hand. This task does not include tank(s), line(s), asphalt and/or concrete replacement.

Grass seed, straw bales, and/or mulch at cost + 10%, receipts are required.

Maximum cost is equal to the proposed cost and any change orders that are approved by the Division prior to completing the work.

6.0 SUBMITTED DOCUMENTS MAXIMUM COST TABLE

The following application, proposal, report, and submittal costs are limited to these maximum reimbursable amounts. These are lump sum costs.

Task Code	Submitted Documents (Applications/Proposals/Reports/Submittals)	Lump Sum Cost
6.1	UST Closure	
	6.1.a TRBCA Closure Report	\$665.00
	6.1.b Soil Stockpile Sampling Report	\$455.00
	6.1.c Over-excavation Report	\$1,455.00
	6.1.d Application to Treat Petroleum Contaminated Soil	\$455.00
	6.1.e Soil Treatment and Disposal Report	\$455.00
6.2	Hazard Notification Report	\$245.00
6.3	Site Check Report	\$1,140.00
6.4	Initial Response and Hazard Management Report (IRHMR)	\$2,900.00
	6.4.a Hazard Management Report	\$560.00
	6.4.b Health and Safety Plan (if not included with IRHMR)	\$495.00
6.5	Impacted Drinking Water Management	
	6.5.a Impacted Drinking Water - Hazard Management Report	\$560.00
	6.5.b Impacted Drinking Water Supply Temporary Response – Proposal (if costs anticipated to exceed \$2500.00)	\$495.00
	6.5.c Impacted Drinking Water Supply Permanent Response – Proposal	\$975.00
6.6	Petroleum Vapor Impact Management	
	6.6.a Petroleum Vapor Impact - Hazard Management Report	\$560.00
	6.6.b Petroleum Vapor Impact Temporary Response – Proposal (if costs anticipated to exceed \$2,500.00)	\$495.00
	6.6.c Petroleum Vapor Impact Permanent Response – Proposal	\$975.00
6.7	Mobile Enhanced Multi-phase Extraction (MEME)	
	6.7.a Application to Perform MEME	\$765.00
	6.7.b 8-hour MEME Report	\$560.00
	6.7.c 24-hour MEME Report	\$765.00
Task Code	Submitted Documents (Applications/Proposals/Reports/Submittals)	Lump Sum Cost
6.8	Free Product Removal	
	6.8.a Free Product - Hazard Management Report	\$665.00

	6.8.b	Free Product Investigation Proposal	\$975.00
	6.8.c	Free Product Investigation Report	\$2,900.00
	6.8.d	Free Product Removal Plan	\$8,565.00
6.9	Initial Site Characterization Report (ISCR) - (Risk Analysis Report is integrated into Report requirements - no additional cost allowed)		\$6,075.00
	6.9.a	Additional Monitoring Well Installation Proposal	\$410.00
	6.9.b	Additional Monitoring Well Installation Report	\$560.00
6.10	Exposure Assessment Report		\$1,600.00
	6.10.a	Additional Remediation and/or Risk Management Response Submittal	\$105.00
	6.10.b	Additional Remediation and/or Risk Management Evaluation - with Division approval	\$975.00
	6.10.c	Risk Analysis Report only	\$195.00
6.11	Soil Gas Survey		
	6.11.a	Soil Gas Survey Application	\$590.00
	6.11.b	Soil Gas Survey Report	\$870.00
6.12	Source Removal (Over-excavation)		
	6.12.a	Source Removal Proposal	\$660.00
	6.12.b	Source Removal Report	\$1,455.00
6.13	Risk Reduction		
	6.13.a	Risk Reduction Proposal	\$455.00
	6.13.b	Risk Reduction Report	\$840.00
6.14	Institutional Controls		
	6.14.a	Institutional Control Proposal	\$455.00
	6.14.b	Institutional Control Report	\$140.00
6.15	Engineering Controls		
	6.15.a	Engineering Control Proposal (estimate must be submitted and approved prior to proposal)	
	6.15.b	Engineering Control Report (cost as proposed and approved)	
6.17	Corrective Action Plan (CAP)		
	6.17.a	CAP - Soil Contamination Only	\$4,950.00
	6.17.b	CAP with Groundwater Contamination	\$8,565.00
6.18	Monitoring Reports		
	6.18.a	Risk Monitoring Report (RMR)	\$1,455.00
	6.18.b	Closure Monitoring Report (CMR)	\$1,455.00
	6.18.g	Corrective Action Baseline Monitoring Report (CABMR)	\$2,265.00
Task Code	Submitted Documents (Applications/Proposals/Reports/Submittals)		Lump Sum Cost

	6.18.h	Corrective Action Monitoring Report with as-built diagrams (CAMR-ab)	\$4,430.00
	6.18.i	Corrective Action Monitoring Report (CAMR)	\$3,165.00
	6.18.j	Corrective Action Closure Monitoring Report (CACMR)	\$1,725.00
6.19	Permit Applications and Discharge Monitoring Reports		
	6.19.a	NPDES Permit Application (submit copy to the Division)	\$600.00
	6.19.b	Discharge Monitoring Report (DMR)	\$350.00
	6.19.c	POTW Application	\$600.00
	6.19.d	POTW Report	\$195.00
	6.19.f	Air Exceedance Report	\$280.00
	6.19.g	Annual Air Emissions Report	\$430.00
	6.19.h	Monitoring Well Maintenance Fee – no markup (Shelby County)	\$50.00
	6.19.i	Class V Underground Injection Well Application (submit copy to the Division)	\$600.00
	6.19.j	Monitoring Well Permit – no markup (Shelby County)	\$600.00
	6.19.k	Right-of-way Bond – no markup	actual cost
	6.19.x	Other Required Permits/Renewals – no markup	actual cost
6.20	Miscellaneous Application/Proposals/Reports/Submittals		
	6.20.a	Field Work Notification	\$45.00
	6.20.b	Boring Log Installation submittal	\$245.00
	6.20.c	Public Notice of Corrective Action	\$130.00
	6.20.d	Water Use and Receptor Survey Report (other than IRHMR/ISCR)	\$1,040.00
	6.20.z	Other report as required by the Division (actual cost as approved by Division project manager in writing). Report name must be listed in the comment section of the reimbursement application.	actual cost
6.21	Corrective Action System Deactivation or Decommission Report		\$245.00
6.22	Monitoring Well Abandonment Report (<6 wells)		\$245.00
6.23	Monitoring Well Abandonment Report (>6 wells)		\$350.00
6.24	Advanced Site Characterization		
	6.24.a	4.4.e.8 Proposal	\$1,010.00
	6.24.b	Advanced Site Characterization Report from the Sub-contractor (includes a CAC site map, cover letter, and summary)	\$2,080.00

	6.24.c	Confirmatory Soil Sampling Report (includes tables, maps, and boring logs)	\$560.00

7.0 PER DIEM AND LODGING PRICE

Task 7.1 Per Diem

7.1.a Cost for per diem charges

This task will include the cost of all per diem charges accrued performing site remediation tasks as requested by the Division. Date(s) and time(s) must not exceed time for being onsite plus travel. Meals will not be reimbursed without a corresponding hotel invoice. No markup allowed. **Maximum cost** shall be reimbursed in accordance with the state of Tennessee travel regulations at the time that work was performed. Current TN travel regulations can be found at:

[Tennessee Travel Regulations](#)

Current CONUS rates can be found at the following link:

[Current CONUS Rates](#)

Task 7.2 Lodging

7.2.a Cost for lodging charges

This task will include the cost of all lodging charges accrued performing site remediation tasks as requested by the Division. Date(s) must not exceed time for being onsite. Hotel invoice must be submitted with reimbursement application. No markup allowed. **Maximum cost** shall be reimbursed in accordance with the state of Tennessee travel regulations at the time that work was performed. Current TN travel regulations can be found at the following link:

[Tennessee Travel Regulations](#)

Current CONUS rates can be found at the following link:

[Current CONUS Rates](#)

8.0 DRUM DISPOSAL PROCESS

Task 8.1 Drum Disposal

8.1.a Cost for drum disposal

This task will include all necessary personnel time, equipment and supplies required to properly dispose of drums filled with soil or water/free product generated from investigation or corrective action activities. This cost is for drum, disposal, and transportation to a permitted disposal facility. Disposal invoice/manifest must be included with the reimbursement application.

If a drum contains free product, three bids for disposal are required for Division review and approval if it cannot be disposed of at the standard rate.

Maximum cost is \$300.00 per drum.

10.0 STATE CONTRACTOR USE ONLY

Task 10.1 Tank Closure and Overexcavation

10.1.a Tank Closure and Overexcavation

Per Notice to Proceed. Refer to tasks 1.1.a (overexcavation), 1.1.d (laboratory), 1.2.a (GW-FP removal with vac truck), 1.2.b (mobilization/demobilization vac truck), and 1.2.e (groundwater-free product disposal).

Any funds received for recycling, salvaging, or resale of the removed tanks and product lines shall be submitted to the Division.

10.1.b Mobilization and Demobilization of heavy equipment

Per Notice to Proceed. Refer to task 1.1.b. (mobilization/demobilization of heavy equipment).

10.1.c Stockpile Loading, Hauling, and Disposal

Per Notice to Proceed. Refer to task 1.1.c. (stockpiling, hauling, and disposal of contaminated soil).

10.1.d QAPP Checklist

Per Notice to Proceed. To be submitted with the required report at a lump sum cost of \$105.

9. Task Cost Sheets

To view the Task Cost Sheets, open the Task Cost Sheets PDF file in the Attachments Panel of the Guidance Manual. Click on the paperclip located on the sidebar panel and select the appropriate file.

10. Instructions for Completing Reimbursement Applications in the Cost Database

The Division of Underground Storage Tanks (Division) has a process for reimbursement involving electronic applications. This process consists of three (3) parts: cost task descriptions, cost task spreadsheets and a cost database. The cost task descriptions provide details of commonly performed tasks at contaminated UST sites (see [section F.8. Task Descriptions](#)). The cost spreadsheets provide the breakdown of routine maximum cost for performing each task. The cost database is a Microsoft Access® program and requires you to use version Access® 2007 or higher. Different versions of Access (32 vs. 64 bit) are available. If you upgrade or change computers, you may need a different version of the cost database. Please contact the Division if you begin encountering problems after a change.

An Access® database has been developed to prepare and submit electronic applications. The database is available for download from the Division's website under Fund and Reimbursement:

<https://www.tn.gov/environment/ust/forms-guidance.html>.

Applications, appeals, questions, comments, etc. should be submitted to: ust.reimbursement@tn.gov.

A. UST Cost Database Instructions

Before beginning any electronic invoice, it is a good idea to become familiar with the task description and associated cost spreadsheet to determine: 1) what job titles are allowed to be billed, 2) what type of equipment is reimbursable for each task and 3) whether the task is an office/field task or travel time to/from task. At first, it may not be obvious where certain tasks should be entered. It may be useful to scan through several sheets before beginning any data entry.

Always use the tab key to exit data boxes and always tab out to save information.

Once information has been entered into a field, it will automatically be saved when you exit that field.

B. To Begin The Invoice

The terms on the first page of the application database must be agreed to by clicking the box. Click on the "Start UST database" button to begin. On the next page, click on the map of the state of Tennessee in any location to open the database.

C. Cost Database Main Page

Click on the "ENTER NEW FACILITY ID/INVOICE NUMBER" button to begin. A pop-up box will appear for the entry of the seven-digit UST facility ID number not including dash. After entry of the UST facility ID number, click ok. Another pop-up box will appear for entry of the invoice number. After entry of the invoice number, click ok. The program is set up with an automatic clock and calendar function. If you do not want to use this feature, then click on the "Pop-up and Other Options" button to disable it. Also, in the "Pop-up and Other Options" button you may turn on/off the auto-complete function and also set the mileage, lodging and per diem rates for the database. Additionally, there are buttons to remove duplicate records from the tblGeneralInformation table and to remove a zero numbered task in the tblReimbursement table.

D. Invoice Entry Page

It is important that all information on this page be correct. The facility ID number will appear as a default on the next page. Enter the appropriate information in all fields. If any field is left blank, a pop-up box will identify the field that needs to be completed. If the case number is not known, enter "Unk". It is recommended that you contact the Division project manager to obtain this number. All work that is to be entered for this invoice must be within the time period entered in "Work Start Date" to "Work End Date" or an error message will occur.

NA or Unk is acceptable in phone number box for the facility phone number only. If the site does not have a corrective action system, then leave the start-up date field blank and click "No" in the "SAVE" pop up box. If you accidentally enter a date, hit the delete key. After all fields are completed, click the "Save/Close" button. This will store all background information that can be used for any future applications for this facility.

E. General Information Page

To begin entering task information/cost, go to the UST cost database main page and click enter/edit task information after selecting a Facility ID and invoice number on the Main page.

1. Entering or deleting employee names

Click the “Enter/Delete CAC Employee Names” button. Enter all employee names and titles. After entering all employees click the “Close Employee” button. Note: employee names on the reimbursement application are to match the employee names exactly as submitted with the annual CAC update or subsequent revisions.

2. Entering or editing detail task information

Click the “Enter/Edit Detail Task Information” button.

F. Process And Tasks Page

Click the “Enter New Task” button. Enter a process, task, sub task, and sub sub task by using the drop down boxes provided. The appropriate buttons applicable to the task will be enabled for data entry.

G. Buttons

Only the buttons applicable to each process/task/sub task/sub sub task will be enabled for data entry. At this time, it is encouraged that you familiarize yourself with each task description and cost spreadsheet before beginning database entry.

Comment fields have been provided throughout the database. These fields should be used to supplement your application submittal and offer explanation when needed.

TRENCHING - Enter costs associated with recovery well trenching or discharge trenching approved by the Division.

PERSONNEL – Personnel hours can be billed as on-site, office, travel to or travel from time. Refer to each task cost description. **NOTE:** Travel time is a separate, billable expense and is **NOT** included in any task description.

RENTALS – A drop down menu is available of the most commonly encountered rental equipment and items. If a piece of equipment does not appear that accompanies the application, then it must be entered on the “Miscellaneous” button and an explanation attached why the piece of equipment was necessary. It is required that you obtain prior approval from the Division project manager for any rental equipment not listed in the drop down menu.

SUPPLIES – A drop down menu is available of the most commonly encountered supplies and items. If a supply does not appear that accompanies the application, then it must be entered on the “Miscellaneous” button. It is required that you obtain prior approval from the Division project manager for any supplies not listed in the drop down menu.

MILEAGE - The starting location should include, at a minimum, the name of the city and the ending location should be the name of the city where the site is located. On the return trip, the ending location should either be the CAC office or another UST site where work has been approved by the Division. If the destination is another UST site, then please enter the seven digit facility ID # and city. **NOTE:** Mileage is a separate, billable expense and is **NOT** included in any task description. .

GROUNDWATER SAMPLING - Reimbursed costs include all personnel and equipment/supplies/portable field instruments.

WELL SURVEYING – Reimbursed costs include all necessary equipment, personnel, and sampling supplies. **DO NOT** itemize separately for personnel time on site. **This task is all an inclusive, lump sum task.** The first four (4) wells must be entered together (i.e., MW-1 – MW-4 @ \$1,246.00). Any additional wells surveyed may be entered on the same page (i.e., MW-5 and MW-6; 2 wells @ \$212.00/each).

ANALYSIS – Reimbursed at cost plus 10% markup not to exceed the rates listed in the FRG.

MEME – Enter costs associated with any mobile enhanced multi-phase extraction event that has been approved by the Division.

CAS INSTALL - Enter costs associated with wellhead vault installation, manifold installation or concrete pad installation approved by the Division not to exceed the approved rates.

WELL INSTALLATION - Enter costs associated with any drilling activity such as direct push, slide hammer, or hammer drill (soil gas survey), augering or air rotary (monitoring well installation) event that has been approved by the Division.

WELL ABANDONMENT - Enter costs associated with any monitoring well abandonment event that has been approved by the Division.

MISCELLANEOUS – This button should be used sparingly and **only** as an exception. It cannot be used for reports. Costs entered on this tab will require justification and may be grounds for a detailed audit.

HAULING/DISPOSAL – Costs for properly disposing of contaminated soil and/or groundwater as approved by the Division not to exceed the reasonable rates in THE FRG.

REPORTS – After selection of the appropriate report, enter the date the report was submitted to the Division and the cost requested.

UTILITIES – Enter costs associated with payment of utilities when a corrective action system has been approved by the Division and is installed.

LODGING/PER DIEM – Enter costs associated with lodging and per diem for Division approved work.

H. Previewing the Information (General Information Page)

The “Print Preview and Printing” button may be used any time prior to creating a file for submittal to the state for review purposes as needed. This is a useful tool, and it is recommended that you review the information entered prior to creating a file for submittal to the state. In this manner, you can determine if the costs will be reimbursed as entered or if there are any disallowable costs.

I. Create File for Submittal to State of Tennessee (Use Only After the Application is Complete)

After all entries have been completed and the file is ready to be created, go to the General Information page and click on the button labeled “3. Create File for State Submittal”. A Browse for Folder box will appear to provide a choice of where the file is to be stored. Click on the appropriate folder for the file to be stored. After the file has been successfully saved, the message “The export file was successfully created” will appear. Click “Ok”.

J. Back-up Documentation to Application

Back-up documentation including invoices, receipts, time sheets, etc. should be scanned and submitted as a pdf file.

K. Suggested Practices

Always make a back-up copy after each session of data entry in a secure and separate file location for problem situations that may arise. Database maintenance should be performed occasionally as needed using the Microsoft Access® manage tool, compact and repair.

L. Certification Affidavit Pages

Applications for reimbursement must be signed by both the Responsible Party and the CAC to verify the costs submitted represent actual costs accrued during the cost of cleanup. The preferred method is for the preparer completing the application to provide a copy of the application to the Responsible Party and attach the certification affidavit pages. After the Responsible Party has reviewed the application, the Certification Affidavit-Responsible Part page must be signed. The CAC should also complete the applicable certification affidavit page in the same manner. Both original, certification affidavit pages must be submitted as the first two pages of the electronic submittal. Applications will not be forwarded to the fiscal office for payment without both completed certification affidavit pages. Copies of these pages are found under Forms and can be downloaded at: <https://www.tn.gov/environment/ust/forms-guidance.html>. (click FUND AND REIMBURSEMENT > click Certification Affidavits for Electronic Reimbursement Applications click CN-0923).

Any item/cost that is not listed in the FRG must be pre-approved by the Division in writing. All back-up documents (emails, letters, etc.) for approval shall be submitted with the application. Failure to obtain Division approval and/or furnish the back-up documentation will result in denial of the requested costs for that item/cost.

M. Appeals

Appeals should be entered as a reimbursement application with the appeal letter included. The appeal submittal process to follow is outlined in the receipt acknowledgement email

REVISION HISTORY TABLE

Revision Number	Date	Brief Summary of Change
0		Issuance of Guidance for Comment Period

DRAFT