DRAFT FOR USE AND PUBLIC COMMENT

Proposed Templates for Multi-part

Corrective Action Plans

*(Feasibility Study – Design and Specification – Record of Decision)*

at Commercial Leaking Petroleum UST

Cleanup Fund-Eligible Sites

*(as described in the 2017 Reasonable Rate Document)*

*Notes:*

1. *Sites that are not eligible for UST Trust Fund coverage, or eligible sites where CAP reimbursement is not being sought, should complete the full Corrective Action Plan scope described in the existing Assessment & Corrective Action guidance, Report Template #7.*
2. *During the multi-step CAP process, each stage of the CAP provides an opportunity to update the written ‘CAP’ with any new information that has been obtained following the submittal of a previous part. Where no new information is available, it is not necessary to repeat the same information that has already been provided in those previous part(s).*
3. *Additionally, if a technology is proposed that would benefit from additional information beyond what is provided in the following templates, please incorporate the additional documentation into the most appropriate step and section below.*

7A. Corrective Action Plan – Feasibility Study

*This template outlines the typical information**that should be provided in a Feasibility Study submitted in lieu of a full Corrective Action Plan (CAP) at an eligible site operating under the 2017 Reasonable Rate Document to maintain access to the Commercial Leaking Petroleum Underground Storage Tank Trust Fund (Trust Fund).*

*The objective of the standalone Feasibility Study (CA Study) portion of this multi-part CAP process at Trust Fund-eligible sites is to provide a robust evaluation of the remedial strategy that was provided in the ‘Conclusion and Recommendations’ section of the preceding Comprehensive Site Assessment (CSA) Report. It should include a very brief summary of any previous abatement efforts (for example, soil excavations or free product recovery events, etc.) and site conditions, along with a more thorough description of any work performed since the completion of the CSA that may help verify the applicability of the recommended remedial alternative.*

*The core of the CA Study is built using the results of pilot studies and ‘rough’ cost estimates (within about ±15% of the actual designed and bid costs) to verify and validate the effectiveness and cost efficiency of a proposed strategy or remedial technology. As described in the June 1, 2016 UST Section Memo entitled “*[North Carolina Petroleum UST Release Corrective Action Phase Project Management: A Calibrated Risk-Based Corrective Action Decision & Implementation Guide](https://files.nc.gov/ncdeq/Waste%20Management/DWM/UST/Corrective%20Action/Corrective%20Action%20Selection_6_1_16.docx)*” the evaluated strategy should incorporate no more than two to three years of active remediation to stabilize the contaminant plume and protect nearby at-risk receptors, while also addressing the bulk of the secondary source and/or high dissolved-phase contamination plumes such that monitored natural attenuation (MNA) may be projected to achieve risk-based closure standards for a site reclassified as ‘low’ risk within approximately ten years following the completion of active remediation. [Note: For some sites with existing impacted receptors within the plume footprint, additional measures may be required beyond that typically applicable at most other sites.] The CA Study should be used to further document those needs where the remedial strategy must vary from the June 2016 guidance.*

1. Site Information
2. Site Identification

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Date of Report: |  | | | | Site Risk/Ranking: | | |  |
| Facility I.D.: |  | | UST Incident Number (if known): | | | | |  |
| Site Name: |  | | | | | | | |
| Street Address: |  | | | | | | | |
| City/Town: |  | | Zip Code: |  | | County: | |  |
| Description of Geographical Data Point (e.g., diesel fill port): | | | |  | | | | |
| Location Method (GPS, topographical map, online map, other): | | | |  | | | | |
| Latitude (***decimal degrees***): | |  | Longitude (***decimal degrees***): | | | |  | |

1. Information about Contacts Associated with the Leaking UST System *(Addresses must include street, city, state, zip code and mailing address, if different.)*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| UST/AST Owner: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| UST/AST Operator: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Property Owner: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Property Occupant: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Consultant/Contractor: | | |  | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Analytical Laboratory: | | |  | | State Certification No: | | | | |  |
| Address: |  | | | | | | Tel: | |  | |

1. Information about Release

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date Discovered: |  | | | |
| Estimated Quantity of Release: | |  | | |
| Cause of Release: |  | | | |
| Source of Release (e.g., Dispenser/Piping/UST): | | |  | |
| Sizes and Contents of Tanks or Other Containment from which the Release Occurred: | | | |  |

1. Executive Summary

Summarize the most pertinent information about the site and the release and indicate the recommended remedy for contamination, using the following outline:

1. Briefly summarize key information about -
   1. The release (such as the source(s), date of discovery, quantity, and type(s) of contaminant released;
   2. Prior remedial actions, including initial abatement, system closure, soil removal, free product recovery, and provision of alternate water;
2. Briefly summarize the conceptual site model based on any previous hydrogeological investigation(s), including key information about:
   1. Soil, groundwater, surface water impacts, and any measured free product (if applicable),
   2. The nature and known extent of contamination, and estimated rate and direction of contaminant migration
   3. The risk classification and ranking and the criteria driving that classification, and likelihood that nearby receptors will be impacted;
3. Briefly summarize the proposed remedial strategy and the basis for this selection, describing in general terms:
   1. The proposed means of accommodating site risk to reduce the risk classification over time,
   2. The target cleanup levels for soil and/or groundwater based on that projected site risk,
   3. The projected timeline for implementation of the remedial strategy, including the schedule for active remediation (typically ~2-3 years), monitored natural attenuation (typically <10 years),
   4. The methods that will be used to evaluate the effectiveness and efficiency of the strategy over time, and
   5. A general estimate of the anticipated cost for implementation and operation of the strategy over the projected lifetime of the site.
4. **Table of Contents**

Provide a table of contents, as follows:

1. List sections, indicating page numbers;
2. List figures, identifying each by number;
3. List tables; identifying each by number; and
4. List appendices, identifying each by letter
5. Update of Site History and Characterization

Any site characterization information provided in the CSA (or any other report) that has been found to be erroneous or otherwise requires updating should be included here. This includes information that would be provided in Sections D through F from the CSA template from the *Guidelines* (Template #6,) covering the site history and characterization, receptor information, and land use. Updates should follow the outlines provided in those sections and include the relevant tables referenced in the CSA template. At a minimum, the receptor survey and land use information must be resurveyed if the existing data have not been updated within the last five years. *Please note: Any deficiencies from the CSA (or other reports) that are not corrected in this section could result in the rejection of the CA Study as incomplete and denial of any claimed costs associated with the Corrective Action Plan presented within this report.*

1. Update of Site Assessment Information

Any plume assessment information provided in the CSA (or any other report) that has been found to be erroneous or otherwise requires updating should be included here. This includes information that would be provided in Sections G through M from the CSA template from the *Guidelines* (Template #6,) covering soil or groundwater assessment, free product assessment and recovery, hydrogeological testing, regional or site-specific geology and hydrogeology, and groundwater plume modeling. Updates should follow the outlines provided in those sections and include the relevant tables referenced in the CSA template. *Please note: Any deficiencies from the CSA (or other reports) that are not corrected in this section could result in the rejection of the CA Study as incomplete and denial of any claimed costs associated with the Corrective Action Plan presented within this report.*

1. Objectives for Corrective Action at the Site

1. Refer to the Notice of Regulatory Requirements (NORR) directing the preparation and submittal of the CAP and any Notices of Violation (NOV) and/or enforcement documents related to CAP submittal, including the date the Notices were made (include copies within Appendix D.);

2. State the purpose and objectives of the CAP (e.g., free product recovery, containment or retardation of plume migration, reduction of contaminant concentrations, protection of nearby water supplies, etc); and

3. Examine and evaluate the cleanup goals of the CAP:

* Discuss the extent of contamination, based upon the findings of prior site assessment activities.
* Indicate the maximum contaminant concentration levels.
* Discuss the potential for contaminant migration and the likelihood of impact to any receptors.
* Describe steps that could result in the removal, replacement, or confirmed protection of any receptors, allowing for lowering or the risk classification and/or rank.
* Discuss the applicable active cleanup levels for soil, groundwater, surface water, and free product (and the basis for their determination) that will provide for plume stability and the protection of at-risk receptors, including references to any proposed modeling techniques.
* Discuss the applicable natural attenuation target levels for soil and groundwater that are predicted to all the site to reach risk-based cleanup levels over time (and the basis for their determination).

1. Comprehensive Evaluation of Remedial Actions

1. Present and comprehensively evaluate the proposed remedial strategy. Discuss the basis for selection of the remedial option, and indicate why it was determined to be the most effective and cost efficient option for remediating contamination at the site.

1. **In validating the selected remedial strategy**, discuss the following, as applicable:
2. Consideration of the nature and source of the contamination, the geology and hydrogeology, and the land use and surface structures present at the site, to include:
   1. Pilot test results;
   2. Aquifer test results;
   3. Other geological/hydrogeological information (geophysical logs, hydrogeologic profiles, etc.);
   4. Horizontal and vertical extent of soil contamination in unsaturated zone;
   5. Thickness and extent of free product;
   6. Horizontal and vertical extent of individual contaminants dissolved in groundwater;
   7. Natural attenuation parameter sampling results;
   8. Mobility or stability of free product and/or the dissolved-phase groundwater plume;
   9. Water supply well user information;
   10. Likelihood of impact to, and replacement/protection alternatives for, all at-risk receptors;
   11. Accessibility of contamination in the unsaturated zone and/or groundwater; and
   12. Estimated volume of contamination / total contaminant mass in soil and/or groundwater to be removed/treated to achieve plume stability and/or risk reduction, or equivalent;
   13. Other groundwater modeling results; and
   14. Any other relevant parameters.
3. Description of the active remedial technology, mechanism, or process. Present the proposed active remediation system design concept based on pilot study and aquifer testing data, to include (as applicable):
   1. Predicted system process cycle;
   2. Proposed system layout/footprint onsite;
   3. Radius of influence for system components, excavation footprint, or location of engineered controls;
   4. Anticipated recovery volumes/rates and pressures/vacuum for soil vapor extraction, dual phase extraction, or groundwater recovery,
   5. Anticipated injection volumes/rate, concentrations, and pressures for air sparging or other injection processes;
   6. Anticipated effluent/emission concentration after each unit of treatment;
   7. Estimated rates of contaminant removal or augmented in situ remediation above natural attenuation;
   8. Estimated schedule for selected technology to achieve plume stability and/or risk reduction (with a target of two (2) years of active operation);
   9. Anticipated milestones for evaluating system operation effectiveness and efficiency over time;
   10. Plan for waste disposal/discharge/exhaust;
   11. Determination of permits necessary for implementation of the remedial option and assessment of feasibility/schedule for permit approval;
   12. Other limitations of the remedial technology, mechanism, or process (including access issues, technological feasibility, etc.) and proposed measures for dealing with limitations;
   13. Figures and tables for pilot study results and to illustrate system plan (Refer to Sections I, J, and K.).
4. Description of the process of natural attenuation. Present the proposed monitored natural attenuation schedule following risk reduction through active remediation, to include (as applicable):
   1. Predicted residual contaminant volume/mass following completion of active remediation;
   2. Predicted natural attenuation risk-based cleanup goals based on site risk reclassification following completion of active remediation; and
   3. Anticipated schedule of the residual contaminant degradation process to achieve risk-based cleanup within ten (10) years of completing active remediation.
5. **For the selected remedial strategy,** explain the proposed plan in further detail, to include:
6. Remedial system operation and maintenance plan (with schedule and discussion of measures to reduce operation and maintenance activities /costs, such as use of automated controls and remote telemetry).
7. Waste treatment/disposal plan (for soil and/or groundwater, free product, used filters, etc.):
8. Estimated volume to be treated/discharged/disposed of,
9. Treatment/discharge/disposal method,
10. Name and address of treatment/disposal facility,
11. Analytical methodology required for any pre-treatment/discharge/disposal samples, and
12. Examples of permit requirements necessary for implementation of the remedial option.
13. Monitoring plan for soil, groundwater, and free product for both the active remediation and natural attenuation cycles (with proposed sampling locations, analytical methods, sampling frequency, and reporting frequency, with predicted changes over time as the contaminant plume is remediated).
14. Comprehensive, well-substantiated proposed schedule describing the anticipated progression from the date of approval for the CA Study, through the remedial system Design and Specification, Record of Decision, installation/implementation of remedial action, transition to monitored natural attenuation, and final attainment of cleanup goals. The schedule should include, but not be limited to, the performance or occurrence of the following actions and processes:
15. risk reduction mechanism implementation (e.g. connecting water supply well users to alternate water sources, modeling plume stability, etc.);
16. soil excavation,
17. treatment system installation and activation,
18. operation and maintenance (~ 2 years, typ.),
19. **active remediation progress milestones** (typically a quarterly schedule for evaluating the efficiency and effectiveness of the remedial strategy through monitoring contaminant mass throughput or in situ cleanup in excess of anticipated natural attenuation processes, etc.),
20. natural attenuation (up to 10 years),
21. **monitored natural attenuation progress milestones** (a quarterly, semiannual, annual, or variable schedule for evaluating the efficiency and effectiveness of natural attenuation to achieve the applicable risk-based cleanup goals for soil and groundwater at this site),
22. risk-based closure mechanisms (institutional or engineering controls, including any projected future monitoring of the maintenance of those controls over time), and
23. project completion.
24. Rough cost estimate for implementation of the proposed active remedial option and monitored natural attenuation cycles, from Record of Decision approval to attainment of cleanup goals, including the costs to purchase any active remedial option, costs for implementation/installation, soil and groundwater monitoring, operation and maintenance, periodic reporting, waste disposal, etc.
25. Public Notice

If public notice is required under 15A NCAC 2L .0114(b) or .0409(a) for the remedial action alternative selected, provide a plan to ensure that the public notice will be properly completed and records of the notice maintained. Refer to Appendix H and provide therein the following: a list of names and addresses of the local authorities and property owners/occupants to whom the public notice will be sent (and reference property owners/occupants table provided using Table B-6, if applicable), an example copy of the proposed public notice, and a copy of any notice that will be posted publicly and the proposed mechanism for that public posting. ***The final CAP Record of Decision (CA Decision) will not be approved until any and all required public notice is complete, and documentary proof is provided, as described above.***

1. Statements and Certification

**The following statements must be included at the closing of the document text, and must display the seal and signature of the certifying P.E. or L.G. in addition to the name and certification number of the company or corporation [See 15A NCAC 2L .0103(e).]**

|  |  |  |  |
| --- | --- | --- | --- |
| **1** | **Enter the date the Corrective Action Plan was due.** Click or tap to enter a date. **Will this Corrective Action Plan Feasibility Study be submitted after the established due date?** | **YES** | **NO** |
| **2** | **Was any recommended information from the above template missing from this report?** | **YES** | **NO** |
| (IF the answer to question #1 or# 2 is “YES”, please replace this note with additional information in this cell to explain what was missing and why.) | | | |
| **3** | **Are there any known or suspected factors that could prohibit risk reclassification and the use of monitored natural attenuation to risk-based cleanup standards following the completion of two years of active remediation under the proposed strategy?** | **YES** | **NO** |
| (IF the answer to question #3 is “YES”, please replace this note with a short description of the possible reason(s), and outline proposed remedies. Greater detail should be provided in the report text above.) | | | |
| **4** | **Does any potential continuing source for the known contamination onsite remain (e.g., an existing, operating system onsite where a leaking component directly responsible for the discovered release has not been found and repaired/replaced, etc.)?** | **YES** | **NO** |
| **5** | **Does any known or suspected source zone soil contamination or free product remain outside of the assessed area that could inhibit the effectiveness of the proposed strategy?** | **YES** | **NO** |
| **6** | **Since release discovery, has there been any unexpected increase in contaminant mass sufficient to suggest a potential new release from a separate onsite or offsite source?** | **YES** | **NO** |
| (IF the answer to any question from #4 - #6 is “YES”, replace this note with a short description of any recommended actions to address, assess, or clean up any other known, suspected, or potential source. Greater detail should be provided in the report text above.) | | | |
| **6** | **Certification:**  I, [Name of Licensed Professional], a [Select License Type] for [Name of Firm or Company of Employment], do certify that the information contained in this report is correct and accurate to the best of my knowledge.  *(Affix Seal and Signature)*  [Name of Firm or Company of Employment] is licensed to practice [Select Corporate Licensure] in North Carolina*.* The certification number of the company or corporation is [Certification Number]. | | |

##### J. Figures

Provide the following:

1. A topographic map illustrating the area within 1500-foot radius of the UST system, showing:

* Topographic contours;
* Site location;
* Buildings;
* Adjacent streets, roads, highways (identified by street names and numbers);
* Surface water bodies;
* Groundwater flow direction(s); and
* North arrow and scale.

2. A site map\* and cross-sections illustrating the UST/AST system(s) and any spills, drawn to scale, showing:

 Buildings and property boundaries;

* Streets, roads, highways;
* Underground utilities, such as sewer lines and other conduits; basements; and vaults;
* Water supply wells, surface water bodies;
* Location and orientation of current and former UST(s), pumps, product lines, sumps, etc.;
* Length, diameter and volume of current and former UST(s);
* Type of material(s) stored in UST(s) (currently and formerly); and

 North arrow and scale.

3. Map(s)\* and geological cross-sections, drawn to scale, depicting all soil analytical results obtained to date, to include:

* Description of soil and bedrock lithology (as determined by investigation to date);
* Location and orientation of any current or former UST(s), AST(s), pumps, piping, sumps, etc., and any known spills;
* Soil sample identification (unique letter and/or numerical code), location, depth, and date collected;
* Soil sample analytical results;
* Final limits of each stage of excavation for each excavation on site (if applicable); and
* Two geological cross-sections, drawn across the contaminated area and intersecting at right angles, showing the vertical distribution of the contaminants in the unsaturated zone. (Indicate vertical and horizontal scale, orientation of each section, location of water table, soil types and lithology, all borings and sample locations represented by the sections, and soil analytical results for each represented sample, and show sections as labeled lines on the map.)

4. Map(s)\* depicting groundwater elevations, to include:

* Groundwater elevations (relative to MSL and corrected for presence of free product);
* Groundwater elevation data points (identified by monitoring well);
* Date of measurement (each map should represent a single water level measurement event);
* Potentiometric contour lines; and
* Groundwater flow direction.

5. Map\*, drawn to scale, depicting the groundwater and surface water analytical results,\*\* to include:

* Location and orientation of any current or former UST(s), AST(s), pumps, piping, sumps, etc., and any known spills;
* Groundwater sample identification (unique letter and/or numerical code referencing monitoring or water supply well), location, and date of sampling;
* Surface water sample identification (unique letter and/or numerical code), location, and date of sampling; and
* Groundwater and surface water sample analytical results.

6. Individual groundwater contaminant isoconcentration contour maps\* for every contaminant present in concentrations which exceed the 2L standard limits,\*\* including:

* Contaminant concentrations (in µg/L) with concentrations in exceedance of MSCCs indicated);
* Contaminant concentration data points (identified by monitoring well);
* Date of measurement (each map should represent a single sampling event;
* Isoconcentration contour lines (solid, if determined from adequate data points; dotted, if estimated);
* A bold isoconcentration contour line representing the 2L standard limit, or CAP cleanup goal, if different, for the contaminant;
* A general plan depicting the footprint of any groundwater remediation system installed on site; and
* Two geological cross-sections, one drawn along the long axis of the plume and the second, across it at right angles, showing the vertical distribution of the contaminants in the saturated zone. (Indicate vertical and horizontal scale, orientation of each section; location of water table; and all monitoring wells represented by the sections, and show sections as labeled lines on the map.)

7. A free product map\* depicting thickness and extent of free product and date of measurement, with a general plan of the footprint of any free product recovery system installed on site\*\*.

8. A potential receptor map that clearly identifies water supply wells (municipal or public/private wells, etc.) and other potential receptors (surface water bodies, basements, utilities, wellhead protection areas, etc.) within 1500’ of the source of the release.

9. A land use map that identifies the following items within 1500’ of the source of the release:

* Features sensitive to impact from the release (schools, daycare centers, nursing homes, hospitals, playgrounds, parks and recreation areas, churches, camps and other places of assembly);
* Properties within or contiguous to the area containing contamination or within and contiguous to the area where the contamination is expected to migrate; and
* Zoning status.

10. A map\* and cross-sections, to be used in conjunction with soil contamination map/cross-sections in item #3, illustrating 3-dimensional extent of proposed excavation area to scale.\*\*

11. Maps\* and cross-sections, to be used in conjunction with soil contamination map/cross-sections in item #3, illustrating, to scale, the proposed remedial technology for soil contamination (present the anticipated system design and layout, to include all major components of the system).\*\*

12. Maps\* and cross-sections, to be used in conjunction with groundwater elevation map, groundwater contamination map/cross-sections, groundwater isoconcentration maps/cross-sections in items #4-6, illustrating, to scale, the proposed remedial technology for groundwater contamination and/or free product recovery (present the anticipated system design and layout, to include all major components of the system).\*\*

***\*Note:*** *Use a single base map to prepare site plans using a map scale of 1 in. = 40 ft.; use a smaller scale for large sites. Maps and figures should include conventional symbols, notations, labeling, legends, scales, and north arrows and should conform to accepted practices of map presentation described in the USGS Geological Survey publication "Topographic Map Symbols”,* [http://store.usgs.gov](http://store.usgs.gov/). *Scale should be expressed as a graphic scale and a verbal statement (e.g., 1 in.= 40 ft) or ratio. Refer to* <http://geokov.com/Education/map-scale.aspx>.

\*\* *If applicable*

##### K. Tables

Provide the following:

1. Site History (Complete Tables B-1 and B-2 from *Guidelines*, Appendix B);

2. Public and Private Water Supply Well and Other Receptor Information (Complete Table B-5 from *Guidelines*, Appendix B)\*;

3. Field Screening Results\*;

4. Summary of Soil Sampling Results (Complete Table B-3 from *Guidelines*, Appendix B)\*;

5. Summary of Groundwater and Surface Water Sampling Results (Complete Table B-4 from *Guidelines*, Appendix B)\*;

6. Monitoring, Pilot, and Remediation Well Construction Information (Complete Table B-7 from *Guidelines*, Appendix B)\*;

7. Free Product Recovery Information (Complete Table B-8A from *Guidelines*, Appendix B)\*;

8. Cumulative Volume of Free Product Recovered from Site (Complete Table B-8B from *Guidelines*, Appendix B)\*;

9. Current and Historical Groundwater Elevations and Free Product Thickness (Complete Table B-9 from *Guidelines*, Appendix B)\*;

10. Land Use (Complete Table B-10 from *Guidelines*, Appendix B);

11. Remediation Schedules and Cleanup Progress Milestones for the Active Remedial Option and Monitored Natural Attenuation Phase;

12. Cost Estimates for the Active Remedial Option and Monitored Natural Attenuation Phase.

*\* If applicable*

***Provide additional tables as necessary to compile information critical to evaluating the proposed remedial technology or procedure (e.g., SVE pilot test data, water supply users to be connected to municipal water supply, etc.) and to validate the proposed schedules and costs for the active remedial option and monitored natural attenuation phase.***

##### L. Appendices

Provide the following:

Appendix A Site Specific Health and Safety Plan (HASP)

Appendix B Copies of permits (soil treatment, wastewater treatment, etc.)\*

Appendix C Geologic logs for borings (related to CAP investigation / pilot studies only)\*

Appendix D Copies of the NORR, NOV, etc. requiring the CAP

Appendix E Rough cost estimate information for the selected remediation technology, including any rough bids received or existing bids for approximately equivalent systems at other sites.

Appendix F General plan for remedial system design and layout, based on pilot study calculations to verify the location and orientation of the proposed system footprint.

Appendix G Logs and calculations documenting the actual pilot test data and results

Appendix H List of local authorities and property owners/occupants to whom public notice of corrective action is to be sent, an example copy of the public notice and a copy of any notice to be publicly posted (if different).

*\* If applicable*

*Provide additional appendices as needed to better validate the proposed remedial strategy.*

7B. Corrective Action Plan – Corrective Action Design

*This template outlines the typical information**to be provided in a Corrective Action (CA) Design submitted in lieu of a full Corrective Action Plan (CAP) at an eligible site operating under the 2017 Reasonable Rate Document (RRD) to maintain access to the Commercial Leaking Petroleum Underground Storage Tank Trust Fund (Trust Fund).*

*The objective of the standalone CA Design portion of this multi-part CAP process at Trust Fund-eligible sites is to provide a formal design for the remedial strategy in the preceding CA Study, as approved by the Department. Please note that any CA Design incorporating engineering practices must be sealed by the professional engineer who developed the remediation system design.*

*The CA Design should include a full remedial system design specification, incorporating pilot test results from the CA Study and all necessary calculations and design drawings, as well as formal individual bid request responses for the fabrication of a turnkey system and installation of that system (and any other standalone Trust Fund RRD task within the scope of system implementation, such as the installation of an infiltration gallery, etc.), and an estimated schedule for fabrication and installation. Remedial strategies that include relocated or rented systems should include any existing design specifications and supplemental designs and/or bids for the additional efforts associated with incorporating the existing system into the remedial strategy for the site (e.g., modifications, enhancements, transit, etc.). For further information on the CA Design task, see the Trust Fund RRD guidance available at:* <https://deq.nc.gov/about/divisions/waste-management/ust/trust-fund/reasonable-rate-documents> *.*

1. Site Information
2. Site Identification

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Date of Report: |  | | | | Site Risk/Ranking: | | |  |
| Facility I.D.: |  | | UST Incident Number (if known): | | | | |  |
| Site Name: |  | | | | | | | |
| Street Address: |  | | | | | | | |
| City/Town: |  | | Zip Code: |  | | County: | |  |
| Description of Geographical Data Point (e.g., diesel fill port): | | | |  | | | | |
| Location Method (GPS, topographical map, online map, other): | | | |  | | | | |
| Latitude (***decimal degrees***): | |  | Longitude (***decimal degrees***): | | | |  | |

1. Information about Contacts Associated with the Leaking UST System (Addresses must include street, city, state, zip code and mailing address, if different.)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| UST/AST Owner: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| UST/AST Operator: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Property Owner: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Property Occupant: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Consultant/Contractor: | | |  | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Analytical Laboratory: | | |  | | State Certification No: | | | | |  |
| Address: |  | | | | | | Tel: | |  | |

1. Information about Release

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date Discovered: |  | | | |
| Estimated Quantity of Release: | |  | | |
| Cause of Release: |  | | | |
| Source of Release (e.g., Dispenser/Piping/UST): | | |  | |
| Sizes and Contents of Tanks or Other Containment from which the Release Occurred: | | | |  |

1. Executive Summary

Summarize the most pertinent information about the site and the release and indicate the recommended remedy for contamination, using the following outline:

1. Briefly summarize key information about -
   1. The release (such as the source(s), date of discovery, quantity, and type(s) of contaminant released);
   2. Prior remedial actions, including initial abatement, system closure, soil removal, free product recovery, and provision of alternate water;
2. Briefly summarize the conceptual site model based on any previous hydrogeological investigation(s), including key information about:
   1. Soil, groundwater, surface water impacts, and any measured free product (if applicable),
   2. The nature and known extent of contamination, and estimated rate and direction of contaminant migration
   3. The risk classification and ranking and the criteria driving that classification, and likelihood that nearby receptors will be impacted;
3. Briefly summarize the proposed remedial strategy and the basis for this selection, describing in general terms:
   1. The proposed means of accommodating site risk to reduce the risk classification over time,
   2. The target cleanup levels for soil and/or groundwater based on that projected site risk,
   3. The projected timeline for implementation of the remedial strategy, including the schedule for active remediation (typically ~2-3 years), monitored natural attenuation (typically <10 years),
   4. The methods that will be used to evaluate the effectiveness and efficiency of the strategy over time, and
   5. A general estimate of the anticipated cost for implementation and operation of the strategy over the projected lifetime of the site.
4. Briefly summarize the proposed remediation system design, describing in general terms:
   1. Projected operating capacities of the primary remedial system components, as applicable (such as recovery or injection volumes and rates, areas of influence or remediation zones, etc.),
   2. The proposed orientation of the system with respect to the site (e.g., projected system structure placement, general trenching orientation, general location of remediation points/wells, discharge outfalls, general excavation footprint orientation, etc.),
   3. General name and location for vendors contacted for bids related to fabrication and/or installation (and any other applicable task) and the total costs represented in the winning bids, and
   4. Estimated schedule for fabrication and installation or injection once the CAP has been approved in full.
5. **Table of Contents**

Provide a table of contents, as follows:

1. List sections, indicating page numbers;
2. List figures, identifying each by number;
3. List tables; identifying each by number; and
4. List appendices, identifying each by letter
5. Update of Site History and Characterization

Any site characterization information provided in the CSA, CA Study, or any other report that has been found to be erroneous or otherwise requires updating should be included here. This includes information that would be provided in Sections D through F from the CSA template from the *Guidelines* (Template #6,) covering the site history and characterization, receptor information, and land use. Updates should follow the outlines provided in those sections and include the relevant tables referenced in the CSA template. At a minimum, the receptor survey and land use information must be resurveyed if the existing data have not been updated within the last five years. *Please note: Any deficiencies from the CSA, CA Study, or any other report that are not corrected in this section could result in the rejection of the CA Design as incomplete and denial of any claimed costs associated with the Corrective Action Plan presented within this report.*

1. Update of Site Assessment Information

Any plume assessment information provided in the CSA, CA Study, or any other report that has been found to be erroneous or otherwise requires updating should be included here. This includes information that would be provided in Sections G through M from the CSA template from the *Guidelines* (Template #6,) covering soil or groundwater assessment, free product assessment and recovery, hydrogeological testing, regional or site-specific geology and hydrogeology, and groundwater plume modeling. This also includes updating or otherwise describing any information provided within the earlier CA Study that is found to no longer be accurate or representative, in whole or in part, related to any aspect of the proposed remedial strategy, including any changes that could affect site risk or available remedial strategies (such as plans for site redevelopment, installation of public water in the area, etc.) Updates should follow the outlines provided in the applicable CSA or CA Study sections and include the relevant tables referenced in the CSA or CA Study templates. *Please note: Any deficiencies from the CSA, CA Study, or any other report that are not corrected in this section could result in the rejection of the CA Design as incomplete and denial of any claimed costs associated with the Corrective Action Plan presented within this report.*

1. Objectives for Corrective Action at the Site

1. Refer to the Notice of Regulatory Requirements (NORR) directing the preparation and submittal of the CAP and any Notices of Violation (NOV) and/or enforcement documents related to CAP submittal, including the date the Notices were made (include copies within Appendix D.);

2. State the purpose and objectives of the CAP (e.g., free product recovery, containment or retardation of plume migration, reduction of contaminant concentrations, protection of nearby water supplies, etc); and

3. Examine and evaluate the cleanup goals of the CAP:

* Discuss the extent of contamination.
* Indicate the maximum contaminant concentration levels.
* Discuss the potential for contaminant migration and the likelihood of impact to any receptors.
* Describe steps that could result in the removal, replacement, or confirmed protection of any receptors, allowing for lowering or the risk classification and/or rank.
* Discuss the applicable active cleanup levels for soil, groundwater, surface water, and free product (and the basis for their determination) that will provide for plume stability and the protection of at-risk receptors.
* Discuss the applicable natural attenuation target levels for soil and groundwater that are predicted to all the site to reach risk-based cleanup levels over time (and the basis for their determination).

1. Remedial Action Implementation

1. Present any information related to the remediation system design for the approved remedial strategy from the CA Study. Discuss the basis for selection of the specific design, the bid responses from vendors and/or service providers for fabrication and installation (and any other applicable task) and indicate why this design and the selected winning bidders were determined to represent the most effective and cost efficient option for remediating contamination at the site.

1. **Describe the remedial system design and specification in detail**, discussing the following, with reference to the attached engineered design and/or manufacturer literature (as applicable):
2. Discuss details about the primary system components, to include:
   1. Make and model for primary mechanical system components (blowers, compressors, etc.);
   2. Anticipated operating loads (volumes, flow rates, pressures, vacuum, etc.) for the primary system components, in comparison with the recommended operation range for the component;
   3. System component lifetime/replacement cycles;
   4. Manufacturer and trade name for chemical injectates (chemical oxidizers, electron acceptors, bioaugmentation slurries, etc.);
   5. Injectate mixing and delivery system design, and any special management procedures associated with the selected chemistry;
   6. Total cost for the fabricated system/injectate supply;
   7. A description of the winning vendor (including qualifications); and
   8. Any other items related to the fabrication of a remedial system or purchase and handling of a chemical injectate.
3. Discuss the system installation strategy, to include:
   1. Formal proposed system layout/footprint onsite, including system structures, pipe trenching, and discharge outfalls, with references to the actual design specifications, where applicable;
   2. Orientation of remediation points/wells (including radius of influence and construction specifications), excavation footprint (including any required shoring or benching), and/or location and construction details for engineered controls;
   3. Chemical injection mixing and delivery system operations, including injection point advancement, point design, injection network orientation, and delivery procedures;
   4. Total cost for the system installation or chemical injection process;
   5. A description of the winning vendor/service provider (including qualifications);
   6. A description of the proposed installation schedule (including details related to staffing and the installation timeline); and
   7. Any other items related to the installation of a remedial system or chemical injection process.
4. **Describe the remediation schedule in detail for both the active remediation and monitored natural attenuation cycles,** discussing the following, with reference to the attached engineered design and/or manufacturer literature (as applicable):
5. Discuss the predicted system operation and maintenance requirements, to include:
   1. Proposed schedule for selected technology to achieve plume stability and/or risk reduction (with a target of two (2) years of active operation);
   2. Proposed active remediation progress milestones (typically a quarterly schedule for evaluating the efficiency and effectiveness of the remedial strategy through monitoring contaminant mass throughput or in situ cleanup in excess of anticipated natural attenuation processes, etc.);
   3. Event frequency and estimated costs for labor and materials related to the maintenance of the remedial system (based upon the specific maintenance schedule for key components within the selected design and/or site-specific conditions) over the estimated active remediation cycle;
   4. Estimated utility/other operating costs related to system operation over the estimated active remediation cycle;
   5. Predicted treatment efficiency and target effluent/emission concentration at discharge;
   6. Status of any applicable permits necessary for system operation or waste disposal/discharge/exhaust (*Note: A CAP Record of Decision may not be approved if necessary permits for operation of a selected technology are not obtained*);
   7. Other limitations of the remedial technology, mechanism, or process (including access issues, technological feasibility, etc.) and proposed measures for dealing with limitations; and
   8. Figures and tables to illustrate system plan (Refer to the actual attached design where applicable.).
6. Description of the process of natural attenuation. Present the proposed monitored natural attenuation schedule following risk reduction through active remediation, to include (as applicable):
   1. Predicted residual contaminant volume/mass following completion of active remediation;
   2. Predicted natural attenuation risk-based cleanup goals based on site risk reclassification following completion of active remediation;
   3. Proposed schedule of the residual contaminant degradation process to achieve risk-based cleanup within ten (10) years of completing active remediation;
   4. Proposed monitored natural attenuation progress milestones (a quarterly, semiannual, annual, or variable schedule for evaluating the efficiency and effectiveness of natural attenuation to achieve the applicable risk-based cleanup goals for soil and groundwater at this site),
   5. Estimated costs for monitoring over the MNA cycle; and
   6. Anticipated costs for risk-based closure mechanisms (institutional or engineering controls, including any projected future monitoring of the maintenance of those controls over time, if applicable).
7. **Provide a full and accurate cost estimate** documenting the turnkey bids for the fabrication and installation of the remedial system (or excavation or chemical injection process), and total lifetime estimated costs for the implementation of the proposed active remedial option and the subsequent monitored natural attenuation cycles over time, from system startup to attainment of cleanup goals, including the costs for routine soil and groundwater monitoring, operation and maintenance, periodic reporting, waste disposal, engineering/institutional controls, etc.
8. Public Notice

If public notice is required under 15A NCAC 2L .0114(b) or .0409(a) for the remedial action alternative selected, provide any applicable modifications to the plan presented in the CA Study to ensure that the public notice will be properly completed and records of the notice maintained. If applicable, refer to Appendix H and provide updates to any of the following: a list of names and addresses of the local authorities and property owners/occupants to whom the public notice will be sent (and reference property owners/occupants table provided using Table B-6, if applicable), an example copy of the proposed public notice, and a copy of any notice that will be posted publicly and the proposed mechanism for that public posting. ***The final CAP Record of Decision (CA Decision) will not be approved until any and all required public notice is complete, and documentary proof is provided, as described above.***

1. Statements and Certification

**The following statements must be included at the closing of the document text, and must display the seal and signature of the certifying P.E. or L.G. in addition to the name and certification number of the company or corporation [See 15A NCAC 2L .0103(e).]**

|  |  |  |  |
| --- | --- | --- | --- |
| **1** | **Enter the date the Corrective Action Plan was due.** Click or tap to enter a date. **Will this Corrective Action Plan Design and Specification be submitted after the established due date?** | **YES** | **NO** |
| **2** | **Was any recommended information from the above template missing from this report?** | **YES** | **NO** |
| (IF the answer to question #1 or# 2 is “YES”, please replace this note with additional information in this cell to explain what was missing and why.) | | | |
| **3** | **Are there any known or suspected factors that could prohibit risk reclassification and the use of monitored natural attenuation to risk-based cleanup standards following the completion of two years of active remediation under the proposed strategy?** | **YES** | **NO** |
| (IF the answer to question #3 is “YES”, please replace this note with a short description of the possible reason(s), and outline proposed remedies. Greater detail should be provided in the report text above.) | | | |
| **4** | **Does any potential continuing source for the known contamination onsite remain (e.g., an existing, operating system onsite where a leaking component directly responsible for the discovered release has not been found and repaired/replaced, etc.)?** | **YES** | **NO** |
| **5** | **Does any known or suspected source zone soil contamination or free product remain outside of the assessed area that could inhibit the effectiveness of the proposed strategy?** | **YES** | **NO** |
| **6** | **Since release discovery, has there been any unexpected increase in contaminant mass sufficient to suggest a potential new release from a separate onsite or offsite source?** | **YES** | **NO** |
| (IF the answer to any question from #4 - #6 is “YES”, replace this note with a short description of any recommended actions to address, assess, or clean up any other known, suspected, or potential source. Greater detail should be provided in the report text above.) | | | |
| **6** | **Certification:**  I, [Name of Licensed Professional], a [Select License Type] for [Name of Firm or Company of Employment], do certify that the information contained in this report is correct and accurate to the best of my knowledge.  *(Affix Seal and Signature)*  [Name of Firm or Company of Employment] is licensed to practice [Select Corporate Licensure] in North Carolina*.* The certification number of the company or corporation is [Certification Number]. | | |

##### J. Figures

Provide the following:

1. A topographic map illustrating the area within 1500-foot radius of the UST system, showing:

* Topographic contours;
* Site location;
* Buildings;
* Adjacent streets, roads, highways (identified by street names and numbers);
* Surface water bodies;
* Groundwater flow direction(s); and
* North arrow and scale.

2. A site map\* and cross-sections illustrating the UST/AST system(s) and any spills, drawn to scale, showing:

 Buildings and property boundaries;

* Streets, roads, highways;
* Underground utilities, such as sewer lines and other conduits; basements; and vaults;
* Water supply wells, surface water bodies;
* Location and orientation of current and former UST(s), pumps, product lines, sumps, etc.;
* Length, diameter and volume of current and former UST(s);
* Type of material(s) stored in UST(s) (currently and formerly); and

 North arrow and scale.

3. Map(s)\* and geological cross-sections, drawn to scale, depicting all soil analytical results obtained to date, to include:

* Description of soil and bedrock lithology (as determined by investigation to date);
* Location and orientation of any current or former UST(s), AST(s), pumps, piping, sumps, etc., and any known spills;
* Soil sample identification (unique letter and/or numerical code), location, depth, and date collected;
* Soil sample analytical results;
* Final limits of each stage of excavation for each excavation on site (if applicable); and
* Two geological cross-sections, drawn across the contaminated area and intersecting at right angles, showing the vertical distribution of the contaminants in the unsaturated zone. (Indicate vertical and horizontal scale, orientation of each section, location of water table, soil types and lithology, all borings and sample locations represented by the sections, and soil analytical results for each represented sample, and show sections as labeled lines on the map.)

4. Map(s)\* depicting groundwater elevations, to include:

* Groundwater elevations (relative to MSL and corrected for presence of free product);
* Groundwater elevation data points (identified by monitoring well);
* Date of measurement (each map should represent a single water level measurement event);
* Potentiometric contour lines; and
* Groundwater flow direction.

5. Map\*, drawn to scale, depicting the groundwater and surface water analytical results,\*\* to include:

* Location and orientation of any current or former UST(s), AST(s), pumps, piping, sumps, etc., and any known spills;
* Groundwater sample identification (unique letter and/or numerical code referencing monitoring or water supply well), location, and date of sampling;
* Surface water sample identification (unique letter and/or numerical code), location, and date of sampling; and
* Groundwater and surface water sample analytical results.

6. Individual groundwater contaminant isoconcentration contour maps\* for every contaminant present in concentrations which exceed the 2L standard limits,\*\* including:

* Contaminant concentrations (in µg/L) with concentrations in exceedance of MSCCs indicated);
* Contaminant concentration data points (identified by monitoring well);
* Date of measurement (each map should represent a single sampling event;
* Isoconcentration contour lines (solid, if determined from adequate data points; dotted, if estimated);
* A bold isoconcentration contour line representing the 2L standard limit, or CAP cleanup goal, if different, for the contaminant;
* A general plan depicting the footprint of any groundwater remediation system installed on site; and
* Two geological cross-sections, one drawn along the long axis of the plume and the second, across it at right angles, showing the vertical distribution of the contaminants in the saturated zone. (Indicate vertical and horizontal scale, orientation of each section; location of water table; and all monitoring wells represented by the sections, and show sections as labeled lines on the map.)

7. A free product map\* depicting thickness and extent of free product and date of measurement, with a general plan of the footprint of any free product recovery system installed on site\*\*.

8. A potential receptor map that clearly identifies water supply wells (municipal or public/private wells, etc.) and other potential receptors (surface water bodies, basements, utilities, wellhead protection areas, etc.) within 1500’ of the source of the release.

9. A land use map that identifies the following items within 1500’ of the source of the release:

* Features sensitive to impact from the release (schools, daycare centers, nursing homes, hospitals, playgrounds, parks and recreation areas, churches, camps and other places of assembly);
* Properties within or contiguous to the area containing contamination or within and contiguous to the area where the contamination is expected to migrate; and
* Zoning status.

10. A map\* and cross-sections, to be used in conjunction with soil contamination map/cross-sections in item #3, illustrating 3-dimensional extent of proposed excavation area to scale.\*\*

11. Maps\* and cross-sections, to be used in conjunction with soil contamination map/cross-sections in item #3, illustrating, to scale, the proposed remedial technology for soil contamination (present the anticipated system design and layout, to include all major components of the system) or any proposed remedial excavation footprints.\*\*

12. Maps\* and cross-sections, to be used in conjunction with groundwater elevation map, groundwater contamination map/cross-sections, groundwater isoconcentration maps/cross-sections in items #4-6, illustrating, to scale, the orientation of the proposed remedial technology for groundwater contamination and/or free product recovery (present the anticipated system design and layout, to include all major components of the system), or the proposed chemical injection network (if applicable).\*\*

***\*Note:*** *Use a single base map to prepare site plans using a map scale of 1 in. = 40 ft.; use a smaller scale for large sites. Maps and figures should include conventional symbols, notations, labeling, legends, scales, and north arrows and should conform to accepted practices of map presentation described in the USGS Geological Survey publication "Topographic Map Symbols”,* [http://store.usgs.gov](http://store.usgs.gov/). *Scale should be expressed as a graphic scale and a verbal statement (e.g., 1 in.= 40 ft) or ratio. Refer to* <http://geokov.com/Education/map-scale.aspx>.

\*\* *If applicable*

##### K. Tables

Provide the following:

1. Site History (Complete Tables B-1 and B-2 from *Guidelines*, Appendix B);
2. Public and Private Water Supply Well and Other Receptor Information (Complete Table B-5 from *Guidelines*, Appendix B)\*;
3. Field Screening Results\*;
4. Summary of Soil Sampling Results (Complete Table B-3 from *Guidelines*, Appendix B)\*;
5. Summary of Groundwater and Surface Water Sampling Results (Complete Table B-4 from *Guidelines*, Appendix B)\*;
6. Monitoring, Pilot, and Remediation Well Construction Information (Complete Table B-7 from *Guidelines*, Appendix B)\*;
7. Free Product Recovery Information (Complete Table B-8A from *Guidelines*, Appendix B)\*;
8. Cumulative Volume of Free Product Recovered from Site (Complete Table B-8B from *Guidelines*, Appendix B)\*;
9. Current and Historical Groundwater Elevations and Free Product Thickness (Complete Table B-9 from *Guidelines*, Appendix B)\*;
10. Land Use (Complete Table B-10 from *Guidelines*, Appendix B);
11. Remediation Schedules and Cleanup Progress Milestones for the Active Remedial Option and Monitored Natural Attenuation Phase;
12. Lifecycle Cost Estimates for the Active Remedial Option and Monitored Natural Attenuation Phase.

*\* If applicable*

***Provide additional tables as necessary to compile information critical to evaluating the proposed remedial technology or procedure (e.g., SVE pilot test data, water supply users to be connected to municipal water supply, etc.) and to validate the proposed schedules and costs for the active remedial option and monitored natural attenuation phase.***

##### L. Appendices

Provide the following:

Appendix A Site Specific Health and Safety Plan (HASP)\*

Appendix B Copies of permits (soil treatment, wastewater treatment, etc.)\*

Appendix C Geologic logs for borings (related to CAP investigation / pilot studies only)\*

Appendix D Copies of the NORR, NOV, etc. requiring the CAP\*

Appendix E All received bid packages (and bid rejections) related to system fabrication or installation.

Appendix F Full remediation system design and specifications, including any applicable diagrams or maps not included above and any calculations or models to validate the system design.

Appendix G Pilot test data/calculations\*.

Appendix H List of local authorities and property owners/occupants to whom public notice of corrective action is to be sent, an example copy of the public notice and a copy of any notice to be publicly posted (if different).

*\* If applicable (or if modified from any version provided with the CA Study)*

*Provide additional appendices as needed to better illustrate the remedial strategy design and specification.*

7C. Corrective Action Plan – Record of Decision

*This template outlines the* ***typical*** *structure of a Corrective Action Record of Decision (CA Decision) completing the Corrective Action Plan (CAP) at an eligible site operating under the 2017 Reasonable Rate Document (RRD) to maintain access to the Commercial Leaking Petroleum Underground Storage Tank Trust Fund (Trust Fund).*

*The objective of the standalone CA Decision portion of this multi-part CAP process at Trust Fund-eligible sites is to provide a formal statement of objectives, schedules, and milestones for the selected remedial strategy and the associated remedial system design that were provided in the preceding CAP CA Study and CA Design steps, as approved by the Department. The CA Decision should focus on clearly defining these objectives, schedules, and milestones to be used to track cleanup progress for both the active remediation and natural attenuation phases of the CAP, following the strategy described in the June 1, 2016 UST Section Memo entitled “*[North Carolina Petroleum UST Release Corrective Action Phase Project Management: A Calibrated Risk-Based Corrective Action Decision & Implementation Guide](https://files.nc.gov/ncdeq/Waste%20Management/DWM/UST/Corrective%20Action/Corrective%20Action%20Selection_6_1_16.docx)*.” The CA Decision should include any information necessary to validate the proposed cleanup objectives, schedule, and milestones, proof of proper completion of public notice, as required for risk-based cleanup goals, as well as a signature page for all parties to the agreement similar to that depicted below.*

*Please note that this CA Decision may differ from other programs with similar ‘Records of Decision’ as it does not formally bind all parties to the letter of the text under threat of penalties or fines. Instead, the CA Decision represents a statement of agreed-upon expectations for site cleanup that are acceptable to the Responsible Party, their primary environmental consultant, the remediation system design engineer, and the Department of Environmental Quality (as represented by the UST Section Corrective Action and Trust Fund Branches.) If, during the course of the implementation of this CAP, the proposed objectives, schedules, and milestones are not being met for any reason (other than negligence or fraud), or if there is any material change to the site or surrounding area that could alter the applicable risk classification for the site, any party to the agreement has the right to request an amendment to the CA Decision going forward, without penalty.*

1. Site Information
2. Site Identification

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Date of Report: |  | | | | Site Risk/Ranking: | | |  |
| Facility I.D.: |  | | UST Incident Number (if known): | | | | |  |
| Site Name: |  | | | | | | | |
| Street Address: |  | | | | | | | |
| City/Town: |  | | Zip Code: |  | | County: | |  |
| Description of Geographical Data Point (e.g., diesel fill port): | | | |  | | | | |
| Location Method (GPS, topographical map, online map, other): | | | |  | | | | |
| Latitude (***decimal degrees***): | |  | Longitude (***decimal degrees***): | | | |  | |

1. Information about Contacts Associated with the Leaking UST System (Addresses must include street, city, state, zip code and mailing address, if different.)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| UST/AST Owner: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| UST/AST Operator: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Property Owner: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Property Occupant: | |  | | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Consultant/Contractor: | | |  | Email: | |  | | | | |
| Address: |  | | | | | | Tel: |  | | |
| Analytical Laboratory: | | |  | | State Certification No: | | | | |  |
| Address: |  | | | | | | Tel: | |  | |

1. Information about Release

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date Discovered: |  | | | |
| Estimated Quantity of Release: | |  | | |
| Cause of Release: |  | | | |
| Source of Release (e.g., Dispenser/Piping/UST): | | |  | |
| Sizes and Contents of Tanks or Other Containment from which the Release Occurred: | | | |  |

1. Executive Summary

Summarize the most pertinent information about the site and the release and indicate the recommended remedy for contamination, using the following outline:

1. Briefly summarize key information about -
   1. The release (such as the source(s), date of discovery, quantity, and type(s) of contaminant released;
   2. Prior remedial actions, including initial abatement, system closure, soil removal, free product recovery, and provision of alternate water;
2. Briefly summarize the conceptual site model based on any previous hydrogeological investigation(s), including key information about:
   1. Soil, groundwater, surface water impacts, and any measured free product (if applicable),
   2. The nature and known extent of contamination, and estimated rate and direction of contaminant migration
   3. The risk classification and ranking and the criteria driving that classification, and likelihood that nearby receptors will be impacted;
3. Briefly summarize the proposed remedial strategy and the basis for this selection, describing in general terms:
   1. The proposed means of accommodating site risk to reduce the risk classification over time,
   2. The target cleanup levels for soil and/or groundwater based on that projected site risk,
   3. The projected timeline for implementation of the remedial strategy, including the schedule for active remediation (typically ~2-3 years), monitored natural attenuation (typically <10 years),
   4. The methods that will be used to evaluate the effectiveness and efficiency of the strategy over time, and
   5. A general total estimate of the anticipated cost for implementation and operation of the strategy over the projected lifetime of the site.
4. Briefly summarize the proposed remediation system design, describing in general terms:
   1. Projected operating capacities of the primary remedial system components, as applicable (such as recovery or injection volumes and rates, areas of influence or remediation zones, etc.),
   2. The proposed orientation of the system with respect to the site (e.g., projected system structure placement, general trenching orientation, general location of remediation points/wells, discharge outfalls, general excavation footprint orientation, etc.),
   3. General name and location for vendors contacted for bids related to fabrication and/or installation (and any other applicable task) and the total costs represented in the winning bids,
   4. Estimated schedule for fabrication and installation or injection once approval of the CAP is completed,
   5. The target active remediation milestones that have been modeled to represent plume stability and receptor protection, and
   6. An estimate of the anticipated cost for implementation and operation of the remediation system during the active remediation phase of cleanup.
5. Briefly summarize the proposed monitored natural attenuation phase, describing in general terms:
   1. Any receptor protection/relocation/replacement steps that will supplement the active remediation in providing for risk reclassification and monitored natural attenuation to a risk-based cleanup goal,
   2. The projected monitoring point count, sampling frequency, and analytical methodologies (and any projected reduction in count, frequency, or methodology changes with time),
   3. The milestones that will be used to evaluate the effectiveness and efficiency of the natural attenuation over time, and
   4. An estimate of the anticipated cost for monitoring the natural attenuation remediation phase of cleanup, and any required supplemental engineering or institutional controls projected to be included as part of a risk-based cleanup onsite.
6. **Table of Contents**

Provide a table of contents, as follows:

1. List sections, indicating page numbers;
2. List figures, identifying each by number;
3. List tables; identifying each by number; and
4. List appendices, identifying each by letter
5. Update of Site History and Characterization

Any site characterization information provided in the CSA, CA Study, CA Design, or any other report that has been found to be erroneous or otherwise requires updating should be included here. This includes information that would be provided in Sections D through F from the CSA template from the *Guidelines* (Template #6,) covering the site history and characterization, receptor information, and land use. Updates should follow the outlines provided in those sections and include the relevant tables referenced in the CSA template. At a minimum, the receptor survey and land use information must be resurveyed if the existing data have not been updated within the last five years. *Please note: Any deficiencies from the CSA, CA Study, CA Design, or any other report that are not corrected in this section could result in the rejection of the CA Decision by the Department and denial of any claimed costs associated with any preceding part of this multi-step Corrective Action Plan.*

1. Update of Site Assessment Information

Any plume assessment information provided in the CSA, CA Study, CA Design, or any other report that has been found to be erroneous or otherwise requires updating should be included here. This includes information that would be provided in Sections G through M from the CSA template from the *Guidelines* (Template #6,) covering soil or groundwater assessment, free product assessment and recovery, hydrogeological testing, regional or site-specific geology and hydrogeology, and groundwater plume modeling. This also includes updating or otherwise describing any information provided within the earlier CA Design that is found to no longer be accurate or representative, in whole or in part, related to any aspect of the proposed remedial strategy and remediation system design, including any changes that could affect site risk or available remedial strategies (such as unforeseen complications for system implementation, changes to any proposed permits, plans for site redevelopment, installation of public water in the area, etc.) Updates should follow the outlines provided in the applicable CSA, CA Study, or CA Design sections and include the relevant tables referenced in those report templates. *Please note: Any deficiencies from the CSA, CA Study, CA Design, or any other report that are not corrected in this section could result in the rejection of the CA Decision by the Department and denial of any claimed costs associated with any preceding part of this multi-step Corrective Action Plan.*

1. Objectives for Corrective Action at the Site

1. Refer to the Notice of Regulatory Requirements (NORR) directing the preparation and submittal of the CAP and any Notices of Violation (NOV) and/or enforcement documents related to CAP submittal, including the date the Notices were made (include copies within Appendix D.);

2. State the purpose and objectives of the CAP (e.g., free product recovery, containment or retardation of plume migration, reduction of contaminant concentrations, protection of nearby water supplies, etc); and

3. Examine and evaluate the cleanup goals of the CAP:

* Discuss the extent of contamination (both at the time of the CSA and recent sampling events, if applicable).
* Indicate the maximum contaminant concentration levels.
* Discuss the potential for contaminant migration and the likelihood of impact to any receptors.
* Describe steps that could result in the removal, replacement, or confirmed protection of any receptors, allowing for lowering or the risk classification and/or rank.
* Discuss the applicable active cleanup levels for soil, groundwater, surface water, and free product (and the basis for their determination) that will provide for plume stability and the protection of at-risk receptors.
* Discuss the applicable natural attenuation target levels for soil and groundwater that are predicted to all the site to reach risk-based cleanup levels over time (and the basis for their determination).

1. Remedial Action Implementation and Evaluation

Discuss in detail:

1. The remedial objectives and projected schedule for active remediation based upon the CA Study and CA Design:

* Discuss the baseline total contaminant mass (or other metric) that will be used to evaluate system effectiveness and efficiency (if applicable).
* For each applied recovery/extraction technology, discuss the predicted mass removal rates that will be measured over time.
* For each in situ/injection technology, discuss the remedial impact that is predicted above background natural attenuation that will be measured and modeled over time.
* For maintained engineering controls, barrier, or plume capture technologies, discuss the modeling used to validate this strategy in the CA study and describe how continued control will be maintained and measured over time.
* Provide discrete, measurable milestones against which each technology above will measured for efficiency and effectiveness on a quarterly basis, and where possible, provide metrics that might trigger the need for a reevaluation and/or modification of the active remedial strategy.
* Discuss the procedure for confirming that the active remediation cleanup goal and plume stability, or alternatively, the technological limitations of the remedial strategy, have been reached (e.g., threshold values, modeling, consecutive events with specific readings from the system or site, etc.).

1. The proposed schedule for any potential receptor protection/relocation/replacement strategies to supplement the active cleanup:

* Provide dates for any scheduled receptor replacement or relocation that is currently planned (such as well abandonments and connection to public water, etc.).
* Discuss the possibility for future opportunities to reevaluate receptor replacement (such as plans by public water supply providers to extend water lines into an unserved area, scheduled redevelopment or property transactions, etc.).
* Discuss limitations on receptor replacement (such as well owners who do not wish to connect to public water and/or abandon their wells) and the steps taken to resolve the issues.
* Provide a schedule for reevaluation of the receptor network status throughout the active remediation phase to determine if a change in ownership or use of a specific receptor may allow for a modification to the remedial strategy.

1. The projected schedule for natural attenuation based upon the expectation of remediation of the source area by the active remediation system to provide for plume stabilization and risk reclassification:

* Discuss the predicted natural attenuation rates that will be measured over time, using the projected contaminant concentrations remaining after active remediation is completed as a baseline.
* Provide discrete, measurable milestones against which natural attenuation will measured (quarterly, semi-annually, annually, or over a shifting cycle)
* Provide metrics, where applicable, that might trigger the need for a supplemental temporary active remediation (e.g., MMPE, or a short-term remediation system rental, etc.) or the reevaluation and/or modification of the natural attenuation strategy.
* Provide a schedule for reevaluation of the receptor network status throughout the natural attenuation phase to determine if any changes in the number, location, or use of any receptors could place a receptor at risk of becoming impacted, requiring a site risk reevaluation.
* Discuss the procedure for confirming that the risk-based cleanup goals have been reached, allowing for site closure (with any applicable engineering or institutional control as described below).

1. The proposed schedule and estimated costs for any engineering or institutional controls that are expected to be necessary for the completion of risk-based corrective action at this site, including any efforts associated with maintaining and/or providing proper notice with respect to the applied controls over time.
2. Where an active remediation schedule in excess of 3 years has been proposed as providing for a more cost effective remedial strategy due to offsets from a shortened natural attenuation schedule, provide additional details including cost justifications to validate the savings predicted for the increased active and decreased natural attenuation schedules in the sections.
3. Where additional ineligible cleanup expenses will be incurred above those representing the most cost effective alternative, at the discretion of the responsible party (e.g., to facilitate a property transaction, or as part of redevelopment, etc.), provide additional details to delineate any Trust Fund ineligible efforts that should be recorded within this CA Decision for tracking purposes from any eligible activities for which reimbursement is anticipated. *[Please note, additional documentation will also be required with any claim where ineligible and eligible activities overlap. Please contact the Trust Fund at (919) 707-8171 if you have any questions about necessary claim documentation.]*
4. Public Notice

If public notice is required under 15A NCAC 2L .0114(b) or .0409(a) for the remedial action alternative selected, provide documentation that the public notice was properly completed. Refer to Appendix H and provide therein the following: a list of names and addresses of the local authorities and property owners/occupants to whom the public notice was sent (and reference property owners/occupants table provided using Table B-6, if applicable), an example copy of the public notice, and a copy of any notice that was posted publicly along with a description of the mechanism for that public posting. ***The final CAP Record of Decision (CA Decision) will not be approved until any and all required public notice is complete, and documentary proof is provided, as described above.***

1. Statements and Certification

**The following statements must be included at the closing of the document text, and must display the seal and signature of the certifying P.E. or L.G. in addition to the name and certification number of the company or corporation [See 15A NCAC 2L .0103(e).]**

|  |  |  |  |
| --- | --- | --- | --- |
| **1** | **Enter the date the Corrective Action Plan was due.** Click or tap to enter a date. **Will this Corrective Action Plan Record of Decision be submitted after the established due date?** | **YES** | **NO** |
| **2** | **Was any recommended information from the above template missing from this report?** | **YES** | **NO** |
| (IF the answer to question #1 or# 2 is “YES”, please replace this note with additional information in this cell to explain what was missing and why.) | | | |
| **3** | **Are there any known or suspected factors that could prohibit risk reclassification and the use of monitored natural attenuation to risk-based cleanup standards following the completion of two years of active remediation under the proposed strategy?** | **YES** | **NO** |
| (IF the answer to question #3 is “YES”, please replace this note with a short description of the possible reason(s), and outline proposed remedies. Greater detail should be provided in the report text above.) | | | |
| **4** | **Does any potential continuing source for the known contamination onsite remain (e.g., an existing, operating system onsite where a leaking component directly responsible for the discovered release has not been found and repaired/replaced, etc.)?** | **YES** | **NO** |
| **5** | **Does any known or suspected source zone soil contamination or free product remain outside of the assessed area that could inhibit the effectiveness of the proposed strategy?** | **YES** | **NO** |
| **6** | **Since release discovery, has there been any unexpected increase in contaminant mass sufficient to suggest a potential new release from a separate onsite or offsite source?** | **YES** | **NO** |
| (IF the answer to any question from #4 - #6 is “YES”, replace this note with a short description of any recommended actions to address, assess, or clean up any other known, suspected, or potential source. Greater detail should be provided in the report text above.) | | | |
| **6** | **Primary Consultant Certification:**  I, [Name of Licensed Professional], a [Select License Type] for [Name of Firm or Company of Employment], do certify that the information contained in this report is correct and accurate to the best of my knowledge.  *(Affix Seal and Signature)*  [Name of Firm or Company of Employment] is licensed to practice [Select Corporate Licensure] in North Carolina*.* The certification number of the company or corporation is [Certification Number]. | | |

1. Record of Decision

|  |  |  |  |
| --- | --- | --- | --- |
| By signing the following Record of Decision, we the undersigned state that the Corrective Action Plan that has been presented in the Feasibility Study, Design and Specification, and Record of Decision documents represents, to the best of our individual understanding, the most cost-effective risk-based remediation strategy available for this site, within current technological and fiscal limitations, and under the guidance offered by the Department of Environmental Quality, Division of Waste Management, Underground Storage Tank Section. We acknowledge that this formal statement of agreement is not a legally-binding document, and that future changes to the remediation strategy may be recommended by any party without penalty, if site conditions change or if the schedule presented above is not being met (absent evidence of fraud, negligence, or willful and wanton misconduct.). | | | |
| **Responsible Party and Representatives** | | | |
| **Responsible Party (or Legal Agent)** |  |  |  |
|  | *(signature)* |  |
|  |  |  |
|  | *(printed name of responsible party - individual or corporate)* |  |
|  |  |  |
|  | *(printed name and title of agent signing on behalf of the responsible party, if applicable)* |  |
| **Primary Environmental Consultant Representative (Licensed Geologist, Licensed Soil Scientist, or Professional Engineer)** |  |  |  |
|  | *(signature and seal)* |  |
|  |  |  |
|  | *(printed name, license number, and title of agent signing for the primary consultant)* |  |
|  |  |  |
|  | *(name of primary environmental consulting firm)* |  |
| **Engineer of Record for Remediation System  Design and Specification** *(if applicable)* |  |  |  |
|  | *(signature and seal)* |  |
|  |  |  |
|  | *(printed name and license number)* |  |
|  |  |  |
|  | *(name of professional engineering firm, if applicable)* |  |
| **Department of Environmental Quality - Division of Waste Management  Underground Storage Tank Section Representatives** | | | |
| **Corrective Action Branch Incident Manager** |  |  |  |
|  | *(signature)* |  |
|  |  |  |
| *(printed name and title)* | | |
| **Corrective Action Branch Regional Supervisor  (or Branch Head)** |  |  |  |
|  | *(signature)* |  |
|  |  |  |
| *(printed name and title)* | | |
| **Trust Fund Branch Technical Auditor (or Branch Head)** |  |  |  |
|  | *(signature)* |  |
|  |  |  |
| *(printed name and title)* | | |
| **UST Section Reviewing Engineer** *(if applicable)* |  |  |  |
|  | *(signature)* |  |
|  |  |  |
| *(printed name and title)* | | |

1. Figures

Provide the following:

1. A topographic map illustrating the area within 1500-foot radius of the UST system, showing:

* North arrow and scale;
* Topographic contours;
* Site location;
* Buildings;
* Adjacent streets, roads, highways (identified by street names and numbers);
* Surface water bodies; and
* Groundwater flow direction(s).

1. A land use map that identifies the following items within 1500’ of the source of the release:

* Water supply wells (municipal or public/private wells, etc.) and other potential receptors (surface water bodies, basements, utilities, wellhead protection areas, etc.) within 1500’ of the source of the release;
* Features sensitive to impact from the release (schools, daycare centers, nursing homes, hospitals, playgrounds, parks and recreation areas, churches, camps and other places of assembly);
* Properties within or contiguous to the area containing contamination or within and contiguous to the area where the contamination is expected to migrate; and
* Zoning status.

1. A site map\*, drawn to scale, illustrating the UST/AST system(s), and depicting groundwater elevations, showing:

* North arrow and physical scale;
* Buildings and property boundaries;
* Streets, roads, highways;
* Underground utilities, such as sewer lines and other conduits; basements; and vaults;
* Water supply wells, surface water bodies;
* Location and orientation of current and former UST(s), pumps, product lines, sumps, etc.;
* Length, diameter and volume of current and former UST(s);
* Type of material(s) stored in UST(s) (currently and formerly);
* Groundwater elevations (relative to MSL and corrected for presence of free product);
* Groundwater elevation data points (identified by monitoring well);
* Date of measurement (each map should represent a single water level measurement event);
* Potentiometric contour lines; and
* Groundwater flow direction.

1. Map(s)\*, (and cross-sections, where applicable) drawn to scale, depicting any spills and/or the measured extent of soil and/or groundwater contamination to include:

* Location and orientation of any current or former UST(s), AST(s), pumps, piping, sumps, etc., and any known spills;
* Final limits of each stage of excavation for each previous excavation on site (if applicable);
* Soil sample identification (unique letter and/or numerical code) and location, sampling date, depth, and analytical results for primary constituent(s) of concern (in mg/kg);
* Groundwater and surface water sample identification (unique letter and/or numerical code) and location, sampling date, and analytical results for primary constituent(s) of concern (in µg/L).
* Free product measurements, including identification (unique letter and/or numerical code) and location, measurement date, and measured thickness.
* Projected footprint delineating the horizontal extent of secondary source contaminated soils / residual free product based on soil analytical results and/or free product measurement data;
* Isoconcentration contour lines for groundwater (solid, if determined from adequate data points; dotted, if estimated);
* A bold soil footprint and/or groundwater isoconcentration contour line representing the MSCC / 2L standard limit, or CAP cleanup goal, if different, for the primary contaminant(s) of concern;

1. Map(s)\* (and cross-sections, where applicable) to be used in conjunction with the contamination delineation map/cross-sections above, illustrating to scale:

* Location and orientation of any current or former UST(s), AST(s), pumps, piping, sumps, etc., and any known spills;
* A 3-dimensional projection of the extent of any proposed excavation area\*\*;
* The proposed remedial technology for soil contamination presenting the anticipated system design and layout, to include all major components of the system, and extent of system influence\*\*;
* The proposed remedial technology for groundwater contamination and/or free product recovery presenting the anticipated system design and layout, to include all major components of the system, extent of system influence, and point of discharge (if applicable)\*\*; and
* The proposed chemical injection network\*\*.

***\*Note:*** *Use a single base map to prepare site plans using a map scale of 1 in. = 40 ft.; use a smaller scale for large sites. Maps and figures should include conventional symbols, notations, labeling, legends, scales, and north arrows and should conform to accepted practices of map presentation described in the USGS Geological Survey publication "Topographic Map Symbols”,* [http://store.usgs.gov](http://store.usgs.gov/). *Scale should be expressed as a graphic scale and a verbal statement (e.g., 1 in.= 40 ft) or ratio. Refer to* <http://geokov.com/Education/map-scale.aspx>.

\*\* *If applicable*

##### K. Tables

Provide the following:

1. Remediation Schedules, including Applicable Baseline and Cleanup Progress Milestones for the Active Remedial Option and Monitored Natural Attenuation Phase;
2. Lifecycle Cost Estimates for the Active Remedial Option and Monitored Natural Attenuation Phase.

Where necessary, provide updated tables for each of the following to document any changes to data presented in the equivalent CA Study or CA Design tables:

1. Site History (Complete Tables B-1 and B-2 from *Guidelines*, Appendix B)\*;
2. Public and Private Water Supply Well and Other Receptor Information (Complete Table B-5 from *Guidelines*, Appendix B)\*;
3. Field Screening Results\*;
4. Summary of Soil Sampling Results (Complete Table B-3 from *Guidelines*, Appendix B)\*;
5. Summary of Groundwater and Surface Water Sampling Results (Complete Table B-4 from *Guidelines*, Appendix B)\*;
6. Monitoring, Pilot, and Remediation Well Construction Information (Complete Table B-7 from *Guidelines*, Appendix B)\*;
7. Free Product Recovery Information (Complete Table B-8A from *Guidelines*, Appendix B)\*;
8. Cumulative Volume of Free Product Recovered from Site (Complete Table B-8B from *Guidelines*, Appendix B)\*;
9. Current and Historical Groundwater Elevations and Free Product Thickness (Complete Table B-9 from *Guidelines*, Appendix B)\*;
10. Land Use (Complete Table B-10 from *Guidelines*, Appendix B)\*;

\* *If applicable*

***Provide additional tables as necessary to compile information critical to evaluating the proposed remedial technology or procedure (e.g., SVE pilot test data, water supply users to be connected to municipal water supply, etc.) and to validate the proposed schedules and costs for the active remedial option and monitored natural attenuation phase.***

##### L. Appendices

Provide the following:

1. Copies of the NORR, NOV, etc. requiring the CAP
2. List of local authorities and property owners/occupants to whom public notice of corrective action is to be sent, an example copy of the public notice and a copy of any notice to be publicly posted (if different).

*Where necessary, provide updated appendices for each of the following to document any changes to data presented in the equivalent CA Study or CA Design reports:*

1. Site Specific Health and Safety Plan (HASP)\*
2. Copies of permits (soil treatment, wastewater treatment, etc.)\*
3. Geologic logs for borings (related to CAP investigation / pilot studies only)\*
4. All received bid packages (and bid rejections) related to system fabrication or installation.\*
5. Full remediation system design and specifications, including any applicable diagrams or maps not included above and any calculations or models to validate the system design.\*
6. Pilot test data/calculations\*.

*\* If applicable*

*Provide additional appendices as needed to better illustrate the remedial strategy design and specification.*