Section 2537. Underground Tank System Removal and Petroleum Contaminated Soil Remediation

2537.01 SCOPE OF WORK.

Perform all work according to 567 IAC, Chapters 120 and 135, applicable OSHA regulations, and this specification.

A. Removal of Underground Tanks.

Complete the following:

1. Remove, collect, and dispose of contents of the tank system.

2. Vent, remove, transport, and destroy all components of the tank system.

3. Obtain and test soil and groundwater samples necessary to complete Iowa DNR's Tank Closure Report.

4. Furnish, install, maintain, and subsequently remove safety fence enclosure around excavated areas.

5. Remove non-contaminated soil and rubble.

6. Furnish, place, and compact suitable backfill soil to finish the excavation to grade.

7. Prepare and provide Tank Closure Reports to the Engineer.

B. Remediation of Petroleum Contaminated Soil.

1. Complete the following:

- **a.** Remove contamination by excavating a specified volume of soil.
- **b.** Transport, spread, and turn contaminated soil at remediation areas designated or approved by the Engineer, or transport and dispose of contaminated soil at an approved solid waste landfill.
- **c.** Obtain and test soil and groundwater samples necessary to complete Iowa DNR's requirements for removal of contaminated soil by excavation.
- **d.** Furnish, place, and compact suitable backfill soil to finish the excavation to grade.
- **e.** Prepare and provide an Over-Excavation of Contaminated Soil report to the Engineer.

2. In situations where suitable remediation sites are not available within the ROW, the contract documents will require delivery of petroleum contaminated soil to a solid waste landfill facility approved by the Engineer.

2537.02 DEFINITIONS.

For the purpose of this specification the following definitions will apply:

A. Contamination.

Contamination or contaminated means the presence of petroleum hydrocarbon constituents at concentration levels at or above those listed in Iowa DNR's Tier 1 Look-Up Table in 567 IAC, Chapter 135. Soils with constituent concentrations below these levels will be classified "non-contaminated."

B. Destroy.

Destroy means rendering a tank system unusable for any purpose other than scrap metal, or landfill material in the case of plastics or fiberglass. Cut up or crush, or both, all components of a system prior to being recycled as scrap or disposed of in a landfill.

C. Land Application.

Land application means the act or process of placing, leveling to a uniform thickness and application rate, incorporation, and remediation of petroleum contaminated soil to a level of constituent concentration less than those listed in the Tier 1 Look-Up Table in 567 IAC, Chapter 135. Land application and land farming are terms which are often used interchangeably.

D. Incorporation.

Incorporation means the process of mixing the contaminated soil after placement to provide a loose and divided soil texture, and leveling at the remediation site. Mixing operations such as disking or harrowing to approximately 2 inches (50 mm) greater than the depth of material placed are considered acceptable.

E. Remediation of Contaminated Soil.

Remediation of contaminated soil means the process of removing contaminated soil by excavation, surface applying the contaminated soil in a relatively thin layer, and allowing natural processes to reduce contamination levels below regulated action levels. Once contaminated soil has been land applied, it shall remain in place until the levels of contamination are below those listed in the Tier 1 Look-Up Table in 567 IAC, Chapter 135.

F. Tank System.

Tank System means underground storage tanks and all associated piping, auxiliary equipment, containment systems and leak detection equipment. A tank system includes, but is not limited to:

- Fill and vent piping,
- Product delivery piping,
- Product pumps,
- Product dispensers,
- Leak detection piping, and
- Leak detection wells.

2537.03 TANK REMOVAL AND SOIL REMEDIATION.

A. Notification.

Based on the Contractor's work schedule, the Engineer will complete necessary Iowa DNR regulatory notifications for tank removals and additional excavation for petroleum contaminated soil.

1. Removal of Underground Tanks.

Provide written notification to the Engineer 45 calendar days prior to removing underground tanks. The Engineer will provide the 30 calendar day Iowa DNR written pre-tank-removal notification.

2. Remediation of Petroleum Contaminated Soil.

a. Provide and submit the Iowa DNR's "Land Application Notification" form to the Iowa DNR with a copy sent to the Engineer at least 30 calendar days prior to beginning excavation activities.

b. The Engineer will waive this notification if:

1) Petroleum contaminated soil will be taken to an approved solid waste landfill.

2) The remediation notification was separately identified and included with the 45 calendar day notification for removal of underground tanks.

3) The excavated material will be stockpiled, pending further remediation activities. In this case, submission of the Iowa DNR notification will be required at least 30 calendar days prior to removing the soil from the stockpile for land application.

B. Location.

1. Removal of Underground Tanks.

The location of all known underground tanks will be identified in the contract documents. Should an underground tank system that is not identified in the contract documents be encountered:

a. Stop all activities in close proximity of the discovery,

b. Promptly notify the Engineer of the discovery, and

c. Do not resume work in the immediate area until authorized by the Engineer.

2. Remediation of Petroleum Contaminated Soil.

a. The location o fexcavation and Engineer-designated remediation area, or approved solid waste landfill will be designated in the contract documents. The Contractor may propose an alternate remediation area, subject to the requirements of 567 IAC, Chapter 120 and the Engineer's approval.

b. If a remediation area is located within a designated borrow or staged construction area, coordinate with the other project contractors and be prepared to stage land application operations so the remediation area remains available for construction project requirements.

c. The contract documents may contain other specific containment requirements.

C. Underground Tank Removal.

1. Removal of Tank Contents.
Prior to tank removal:

a. Remove all liquid, sludge, and/or sand from the tank system. Collect, and dispose of according to Federal, State, and local regulations.

b. Vent tanks and purge to reduce vapors below explosive levels.

2. Removal of Underground Tanks.
Remove and destroy the tank, all associated piping, and auxiliary equipment.

D. Excavation, Placing Backfill Material, and Safety Fence.

1. Removal of Underground Tanks.

a. Excavation required for underground tank removal includes:

- The excavation necessary to remove the tank including all original backfill material that was placed when the tank was installed, and
- The excavation necessary to remove piping associated with the underground tank system.

b. Immediately notify the Engineer if excavated material contains suspected contamination pursuant to 567 IAC 135.6. Remediate, in the manner described in this specification, excavated material that has petroleum contamination. All other sand fill, rubble, and materials associated with tank removal become the property of the Contractor. Remove these materials from the project according to Article 1104.08.

2. Remediation of Petroleum Contaminated Soil.

a. Approximate limits of excavation (horizontal and vertical) will be identified in the contract documents. Actual excavation limits will be determined in the field and based on the extent of contaminant migration. Continue excavation until:

- Organic Vapor Monitoring (OVM) readings and laboratory tests indicate remaining soil is at, or below, Iowa DNR's Tier 1 Look-Up Table levels published in 567 IAC, Chapter 135, or
- Directed by the Engineer to stop.

b. In situations where petroleum contaminated soil is below a layer of non-contaminated soil, remove and stockpile the non-contaminated soil before or during excavation of the contaminated area. Non-contaminated soil may be used for backfill material provided Type A compaction, according to Section 2107, can be achieved. If non-contaminated excavated soil does not meet the requirements of Article 2102.03, F or cannot achieve adequate compaction, it becomes the property of the Contractor. Remove it from the project according to Article 1104.08.

3. Placing Backfill in Excavations.

a. Furnish backfill material consisting of earth fill. Use material meeting the requirements of Article 2102.03, F.

b. Obtain the Engineer's authorization prior to placing backfill. Complete the backfill placement and compaction operation:

- According to the requirements of Section 2107 for Type A compaction, and
- Within ten working days after authorization is given.

c. Grade the site, shape to drain, and leave in a condition complying with Article 1104.08.

4. Safety Fence.

Furnish, place, and maintain safety fence meeting the requirements of Article 4188.03 around the site of work. Remove after completing backfill placement operations. Fencing material remains the property of the Contractor.

E. Sampling and Testing for Petroleum Contamination.

Ensure all sampling and environmental site work is supervised by a Groundwater Professional certified by the Iowa DNR in accordance with 567 IAC, 134. The Groundwater Professional shall obtain, prepare, and submit samples for laboratory analysis. Ensure this work is performed in a manner consistent with standard practices for sampling and testing of petroleum contamination and 567 IAC, 135. Ensure analysis of samples is performed by a laboratory certified by Iowa DNR pursuant to 567 IAC, 83.

1. Removal of Underground Tanks, Sampling and Testing.

a. After a tank has been removed, have the Groundwater Professional obtain soil and groundwater samples and submit them for laboratory analysis as required by 567 IAC, 135.

b. Submit all laboratory analysis reports and a copy of the Chain-of-Custody form to the Engineer as soon as available from the testing laboratory.

c. Dispose of all soil and water generated during the sampling, testing, and installation of ground water monitoring wells. Dispose of this material according to applicable Federal, State, and local regulations.

d. Sample and test as follows:

1) Soil Samples.

a) The locations for sampling in the areas where the tanks and the associated piping have been removed are as defined in the Iowa DNR guidance document for "Underground Storage Tank Closure Procedures for Tank and Piping Removal".

b) The presence of standing water in an excavation may cause bottom soil samples to be invalid. In this situation, take required bottom soil samples from the excavated sidewall immediately above the surface water and in the assumed down gradient direction when possible. Ensure the Tank Closure Report contains an explanation and justification for all alternate sampling locations.

2) Ground Water Sample.

a) Sampling locations are as outlined in 567 IAC, 135. Ensure groundwater sampling wells are:

(1) Installed and closed by a Certified Water Well contractor registered in the State of Iowa pursuant to 567 IAC, 82.

(2) Cased wells constructed according to 567 IAC 110.11.

b) Ensure water samples are obtained from cased, fully developed, purged, and stabilized wells. After use, close all sampling locations according to applicable Iowa DNR regulations. Provide a completed Iowa DNR "Abandoned Water Well Plugging Record," DNR Form 542-1226, to Iowa DNR for each well closed. Submit a copy of these forms to the Engineer at the conclusion of the project.

c) Obtain the Engineer's approval prior to closing a well.

2. Remediation of Petroleum Contaminated Soil, Sampling and Testing.

a. During excavation of contaminated soil, have the Groundwater Professional test a representative sample of soil from each truck load for VOCs, using appropriate confined head-space air sampling procedures and portable Organic Vapor Monitoring (OVM) equipment. Ensure OVM equipment is calibrated using a benzene standard and readings are approximately correlated to known Total Petroleum Hydrocarbon (TPH) concentrations in a soil matrix. Continue excavation until:

- In the judgment of the Groundwater Professional, remaining soil contamination is below Iowa DNR's Tier 1 Look-Up Table levels, or
- Excavation is stopped by the Engineer.

b. Upon completion of excavation, ensure the Groundwater Professional obtains soil samples for laboratory analysis from the excavated side walls and bottom according to 567 IAC, 135 unless directed otherwise by the Engineer. Have the Groundwater Professional develop a final site sampling plan and submit it to the Engineer for approval prior to final sampling. Ensure this plan, at a minimum, identifies the total number of samples to be collected and the distribution of sampling locations.

F. Documentation and Reports.

1. Removal of Underground Tanks.

a. Submit a completed Tank Closure Report to the Engineer within 30 calendar days of completing tank removal. Ensure this report complies with the requirements of 567 IAC, 135. In the report include the location of all tanks, piping, sampling locations, and excavation limits referenced to station and offset distance from mainline or side road survey center line on the tank closure site map. The use of a Professional Land Surveyor licensed in the State of Iowa is not required for the development of a tank closure site map.

b. Complete and return to the Engineer a written “Certificate of Destruction” for all tanks which have been removed. These forms are available from the Engineer.

2. Remediation of Petroleum Contaminated Soil.
Document all field activities. Make all field documentation available to the Engineer upon request. Prepare and submit an Over-Excavation Soil Report at the end of the project. In this report include, at a minimum:

a. Daily Diary.
A narrative record of daily site events relative to excavation, sampling, transporting, and spreading of soil as outlined in this specification.

b. Field OVM Testing.
A field log tabulating all OVM field testing, dates and approximate times for individual tests, the results of each OVM test, and site map designating approximate site location of removed soil being tested.

c. Laboratory Results and Site Map.
A copy of all laboratory analytical results, a scaled site map locating sampling locations, and a copy of all chain-of-custody forms. Ensure site maps are referenced to station and offset distance from mainline or side road survey center line. The use of a Professional Land Surveyor licensed in the State of Iowa is not required for the development of a sampling and soil excavation site map.

d. Abandoned Water Well Plugging Record.
Include in the report a copy of DNR Form 542-1226 for each ground water sampling well constructed and closed.

2537.04 METHOD OF MEASUREMENT.

Measurement will be as follows:

A. Removal of Underground Tanks.
By count for the number of underground tanks removed.

1. Sampling and Testing for Petroleum Contamination (Water and Soil Samples for Removal of Underground Tanks).
By count for the number of soil and water samples taken and tested by a laboratory as described in this specification.

2. Water Sampling Well.
By count for the number of water sampling wells constructed and closed. Payment for water sampling wells constructed, but which are required by the Engineer to remain available for later sampling, will be according to Article 1109.03, B.

B. Remediation of Petroleum Contaminated Soil.
Cubic yards (cubic meters) of excavated petroleum contaminated soil determined by cross-sectioning the excavated area before and after excavation. Quantities will be computed from cross section measurements by the average end area method.

1. **Sampling and Testing for Petroleum Contamination (Water and Soil Samples for Remediation of Petroleum Contaminated Soil).**
   By count for the number of samples taken and tested by a laboratory as described in this specification.

2. **Embankment-in-place.**
   Cubic yards (cubic meters) determined according to the provisions of Article 2102.04. Non-contaminated soil stockpiled during the excavation, and which is used for backfill material, will not be measured for payment.

2537.05 BASIS OF PAYMENT.

Payment for the items below will be at the contract unit price as follows:

A. Underground Tanks

1. **Removal of Underground Tanks.**
   - **a.** Each. Payment is full compensation for:
     - Removal of the tank and associated piping,
     - All labor, equipment, material, health and safety requirements, excavation, and backfill material and placement necessary for required removal,
     - Transporting and destruction of the tank system,
     - Removal, containment, transportation, and disposal of the tank system's contents,
     - Removal of non-contaminated excavated materials from the project,
     - Furnishing, placing, and removing safety fence,
     - Furnishing, placing, and compacting backfill material,
     - Final grading and seeding of the excavated area,
     - Providing the services of a Groundwater Professional, and
     - Preparing and submitting Certificate of Destruction forms.
   - **b.** If remediation of contaminated soil is required by the contract documents, the cost of remediation is included in the cost of Remediation of Petroleum Contaminated Soil.

2. **Sampling and Testing for Petroleum Contamination (Water and Soil Samples for Removal of Underground Tanks).**
   - **a.** Each for soil or water samples taken and tested by a laboratory as described in this specification.
   - **b.** Payment is full compensation for:
     - All labor, equipment, sample preparation, transportation, and testing to comply with applicable Iowa DNR regulations,
     - Disposal of all contaminated soil from sampling events, and
     - Preparation and submittal to the Engineer of Iowa DNR's Tank Closure Reports.

3. **Water Sampling Well.**
   - **a.** Each for water sampling wells constructed and closed.
   - **b.** Payment is full compensation for:
     - All labor, equipment, and materials to install each cased well,

- Purging prior to taking samples,
- Closing the well
- Disposal of all contaminated soil and water generated as a result of well installation,
- Purging and sampling events, and
- The preparation and submittal to the Engineer of Iowa DNR's Abandoned Water Well Plugging Records.

4. **Remediation of Petroleum Contaminated Excavation.**
Payment for remediation of contaminated excavation soil not identified in the contract documents, but associated with Removal of Underground Tanks, will be according to Article 1109.03, B.

B. Petroleum Contaminated Soil.

1. **Remediation of Petroleum Contaminated Soil.**
   a. Per cubic yard (cubic meter).
   b. Payment is full compensation for:
   - All labor, equipment, and materials required to excavate, transport, spread, incorporate, and turn petroleum contaminated soil in compliance with Federal, State, and local regulations,
   - Contractor's employee health and safety requirements,
   - Furnishing, placing, and removing safety fence,
   - Final grading and seeding of the excavated area, and
   - Providing the services of a Groundwater Professional.

   c. Payment includes:
   - Landfill costs if so designated in the contract documents. Stockpiling, covering the stockpile, and work associated with ultimate placement in a borrowed or staged construction area is incidental to this item.
   - Turning the petroleum contaminated soil once a month for the first three months during landfarm season as defined in 567 IAC, 120. Payment for additional turning directed by the Engineer will be according to Article 1109.03, B. Field sampling and testing using OVM equipment is incidental to this item.

2. **Sampling and Testing for Petroleum Contamination (Water and Soil Samples for Remediation of Petroleum Contaminated Soil).**
   a. Each for soil or water samples taken and tested by a laboratory as described in this specification.
   b. Payment is full compensation for:
   - All labor, equipment, materials, sample preparation, transportation, and testing to comply with Iowa DNR requirements for petroleum contaminated soil,
   - The preparation and submittal to the Engineer of site documentation including a Site Sampling Plan, if required, and
   - An Over-Excavation Report.

3. **Embankment-in-place.**
   a. Per cubic yard (cubic meter).

b. Payment is full compensation for furnishing, transporting, placing, compacting, and final grading of the backfill material.

c. Placement and compaction of non-contaminated backfill soil stockpiled as a result of the excavation is incidental to this item.