Montana Department of Environmental Quality
Waste and Underground Tank Management Bureau
Underground Storage Tank Section

Underground Storage Tank Inspector Reference Manual

Updated August 9, 2021

MDEQ/WUTMB
1520 East 6th Ave
PO Box 200901
Helena, Montana 59620-0901
406-444-5300
https://deq.mt.gov/twr/Programs/ust

Disclaimer

This manual is intended as guidance to aid underground storage tank compliance inspectors and UST owners and operators in understanding and implementing Montana Department of Environmental Quality (MDEQ) regulatory requirements. It is not intended to supplement or replace any statutory or regulatory requirements and does not create any enforceable rights at law or equity. In the event of any inadvertent conflict between this guidance and MDEQ's statutes and regulations, the statutes and regulations shall control.

Updates to this manual occur from time to time and current version is available at the UST website: https://deq.mt.gov/twr/Programs/ust

Table of Contents

1. Introduction 1

2. Compliance Inspection Background 2
   General Information 2
   Compliance Process Keys 3
   Egregious Non-compliance 5
   Recommended Tools 6
   Maintenance, Repairs and Upgrades: What's the Difference? 6
   Known or Suspected Releases 7-8
   Cathodic Protection Systems 8

3. Filling out the Inspection Forms 9
   Before the Inspection Begins 9
   General Information 9
   Page 1: UST Notice of Compliance Inspection 11
   Page 2: UST Inspection Checklist 12
   Page 3: Farm, Residential, Heating Oil & Emergency Generator Tanks 15
   Page 4: Manual Tank Gauging 16
   Page 5: Automatic Tank Gauging 19
   Page 6: Interstitial Monitoring for Double Walled Tanks 22
   Page 7: Leak Detection for Piping 23
   Page 8: Interstitial Monitoring for Double Walled Pipes 30
   Page 9: Vapor Monitoring 34
   Page 10: Groundwater Monitoring 35
   Page 11: Inventory Control/Tank Tightness Testing 36
   Page 12: Statistical Inventory Reconciliation 39
   Page 13: Corrosion Protection 41
   Page 14: General Site Plan 43
   Page 15: Field Inspection Report 44

4. General Information 45
   Miscellaneous 45
   Other Forms 46
   Licensed Compliance Inspector Qualifications 46
   General Duties…… 46
   Impartiality 47
   False Statements 47
   Internet Resources 47
   Resources and References 48
   Inspection Tools 48

Chapter 1: Introduction

Thorough review of cleanup and compliance information, the DEQ's Underground Storage Tank Section's personnel have observed numerous and repeated problems with the management of underground storage tank (UST) systems. These problems can be operational, such as improper performance of release detection, or equipment-related, such as mechanical or electronic failure or leakage. These problems are often the result of improper operation and maintenance, initial installation or upgrade errors, and general equipment failure.

In 1999, the Montana State legislature modified the Underground Storage Act to require the inspection of regulated UST systems every three years. It is believed that routine inspections will save UST owners/operators considerable costs over time by: 1) preventing leaks and spills; 2) discovering small problems before they become large ones; 3) promoting good operation and maintenance practices; and 4) extending the overall life of UST systems.

This manual serves a number of purposes. First, it is designed to help introduce interested persons to the overall inspection program. It highlights inspection requirements, as well as the compliance inspection itself.

Second, this manual is required reading for those persons interested in becoming a licensed compliance inspector.

Third, this manual is an excellent reference guide for use on the job site and should be brought to the job site as a resource to help ensure that inspections are done correctly.

Chapter 2: Compliance Inspection Background

This chapter outlines the key points of the licensed compliance inspection program. Further detail on these points is provided in other chapters of this manual.

General Information

- ✓ **Compliance Inspection Purpose.** A compliance inspection is defined to examine, assess and document release detection equipment, spill and overfill devices, and corrosion protection equipment, and examine related records and test reports and verify their functionality and validity.

- ✓ **Licensed Compliance Inspectors.** Only persons licensed by MDEQ/UST for UST compliance inspections may perform an UST compliance inspection and sign inspection forms. It is the responsibility of the Owner/Operator (O/O) to retain a licensed compliance inspector.

- ✓ **Operating Permits.** All UST system must have an Operating Permit (OP) to RECEIVE or DISPENSE fuel. **OP status is found at https://deq.mt.gov/files/Land/UST/Documents/MonthlyReportsPDF/USTFacilityOperatingPermitStatus.pdf.** Compliance inspections are required every three years for regulated underground storage tank (UST) systems to receive an OP. The inspection date is determined by the O/O of the UST facility.
- ✓ **Form Review.** Within 90 days of receiving the inspection report showing the facility is in compliance with UST regulations, MDEQ/UST will review the inspection forms and mail the O/O an OP issued to the facility with each tanks' compliance status noted on the OP.

- ✓ **Tanks Requiring Inspection.** Inspection is required for UST systems currently in service or inactive tank systems. Inactive systems must be inspected and in compliance with all inactive requirements. The compliance inspector must inspect each UST system and document compliance status identical to active UST systems. Some UST systems do not require a compliance inspection as defined by ARM 17.56.102(https://rules.mt.gov/gateway/RuleNo.asp?RN=17%2E56%2E102).

- ✓ **Permanent Tags.** MDEQ/UST provides a permanent metal tag for each notified UST. This metal tag is a permanent tag and must be attached to the tank or underground piping system. The tag is for record keeping purposes such that all parties may identify a particular UST system. Each UST system compliance status is documented on the OP.

- ✓ **Inactive Tanks.** Inactive tanks must also have affixed permanent tags for identification and record keeping purposes.

- ✓ **New USTs.** All new facilities will receive Conditional Operating Permits valid for 6 months when MDEQ/UST receives all installation permit documentation, Certification of Compliance and a Notification Form. These facilities must have an initial inspection between 90 and 120 days after the issuance of a Conditional Operational Permit (COP).

- ✓ **Cathodic Protection Testing.** A qualified cathodic protection person must perform the cathodic protection test. Contact MDEQ/UST for a list of qualified corrosion protection testers. For more information, see "Corrosion Protection" page later is this manual for more information.

- ✓ **Class A, B and C Operator Training.** All facilities must have trained Operators, classified as Class A, B and C operator within 30 days of assuming operation of the UST(s) systems. Class A and B operators are trained by our on-line training available at: https://tankhelper.mt.gov/. Operators will have a Certificate of Operator Training printed from our web training application available for review.

- ✓ **Violations that are SOC.** Violations that are identified by the UST section as Significant Operational Criteria (SOC) as defined by the EPA will require all of the B Operators to be re-trained in the area of non-compliance using our TankHelper II online training program.

- ✓ **Inspection Form Submittal.** The licensed compliance inspector must submit the original inspection reports (or re-inspection report) OR an e-copy signed by the inspector and O/O to MDEQ/UST. The report must be submitted to MDEQ/UST within 15 days of completion of the (site) inspection using any approved form of delivery to the UST section (scanned and emailed, faxed or mailed).

Compliance Process Keys

- ✓ **Violations.** The O/O shall correct all violations determined by the UST section discovered in a compliance inspection report, either within 90 days of receipt of the inspection report by the O/O, or at least 14 days prior to the expiration of the facility's OP, whichever occurs first. For violations that have moderate or minor gravity, as defined in ARM 17.4.303, the UST section may establish another time period in which the violations must be corrected. See the below section, "Corrective Action Plans" for detailed information.

  Violations not corrected within the required corrective action timeframe may likely be referred to DEQ Enforcement Division for resolution and financial penalty.

- ✓ **Corrective Action Plans.** The UST section will issue Corrective Action Plans (CAP's) to owners that document required actions to correct violations discovered during a compliance inspection. CAP's will have specific dates for compliance.

  If an inspection shows there are violations at a facility, then corrective action is required. Corrective action requirements are detailed on a CAP and are prepared by the UST section compliance inspection reviewer. UST violations are divided into four significance levels. These are: minor, moderate, major, and Not Applicable (N/A). The significance assigned to a violation affects the corrective action time frame given for that violation.

  Each violation with significance of minor, moderate or major gravity is assigned a Corrective Action Time Frame or CATF. A CATF is a time period provided by the UST section and documented in the CAP to the facility owner/operator in which they may correct a violation without the UST section escalating to enforcement action. An N/A violation has no assigned corrective action time frame as explained below.

  ARM 17.56.309(7) requires that an O/O of an UST correct the violations within 90 days or 14 days before the operating permit expires, whichever occurs first. For violations that have moderate or minor significance, the UST section may establish another time period in which the violations must be corrected. To correct a violation, the facility must conduct a re-inspection documenting that the violation has been corrected. The following CATF's are used, depending on the level of significance:

Major Violations - are assigned 90 days or 14 days before the operating permit expires, whichever occurs first,

Moderate Violations - are assigned 6 months,

Minor Violations - are assigned 90 days prior to the expiration of the next operating permit (date the next compliance inspection is due), and

N/A (or Not Applicable) - is a violation that cannot be corrected so no CATF is given. However the UST section may still enforce on "N/A" violations if necessary.

As mentioned before, ARM 17.56.309(7) states that the UST section may establish other time frames for moderate and minor violations. One example of this is when a history of passing monthly leak detection results is available from the ATG. Policy dictates this is a moderate violation, which would normally be given a 6 month corrective action time frame. However, after 6 months the facility would only be able to have 6 months of monthly records. Therefore this violation is given a corrective action time frame of one year.

- ✓ **Operating Permits.** An UST system is approved to receive and dispense a regulated substance when the facility is issued an Operating Permit (OP). Each UST at a facility may be issued a different level of operating status (full, sufficient or partial), depending on that individual UST system compliance status.

  Full Operating Permit. This type of Operating Permit will be issued when there are no violations found during the review of the compliance inspection. There may be reminders and recommendations issued with a full Operating Permit. This permit is valid for 3 years.

  Sufficient Operating Permit. This type of Operating Permit will be issued when the highest significance of violation is one or more minor violations. Reminders and recommendations may also be issued with a sufficient operating permit. This permit is valid for 3 years.

  Partial Operating Permit. This type of Operating Permit will be issued when there is at least one violation of moderate or major significance. Reminders and recommendations may also be issued with a partial Operating Permit. This permit is valid for 3 years.

  Conditional Operating Permits. This type of operating permit will be issued to a new facility or to an inactive facility that has allowed its previous operating permit to expire. This type of permit is issued to allow the facility to demonstrate compliance with the UST regulations. This permit is good for 6 months and an inspection is needed between 90 and 120 days after the permit is issued or re-issued to obtain a 3 year Operating Permit.

  When a re-inspection is received by the UST section that shows violations are corrected, a new Operating Permit will be issued when the current level of compliance at the facility has changed.

- ✓ **Re-inspections.** The O/O shall submit to the UST section a re-inspection report, from a licensed compliance inspector following the issuance of a CAP either,
  (a) Within seven days after completion of the corrective actions required by the UST section,
  (b) At least 14 days before the expiration of the facility's operating permit, whichever occurs

first; or

(c) Within another time frame determined by the UST section.

All corrective actions must have a re-inspection to verify compliance, except operator training violations.

- ✓ **Modified Corrective Action Plans.** The UST section may issue what the UST section refers to as a Modified Corrective Action Plan (MCAP) when the UST section receives a re-inspection. The purpose of the MCAP is to issue a revised CAP based on the re-inspection. The MCAP may have new violations, violations that were corrected and/or existing violations that have reduced significance (i.e. from "major" to "moderate".) The MCAP tells O/O's which violations remain to be corrected and what the timeframe is for required corrections.

- ✓ **Re-issuance of Operating Permit.** The UST section will issue a new OP with the MCAP if the compliance status of the facility changes during the re-inspection process.

- ✓ **Site Conditions at Time of the Inspection.** With a few exceptions (such as record keeping history), a compliance inspection is focused on checking site conditions at the time of inspection, not recent site conditions or future conditions. The inspection is a "snap-shot" in time.

Egregious Non-compliance

- ✓ **No Operating Permit.** MDEQ/UST will not provide an Operating Permit to an UST system in egregious noncompliance. The deficiencies must be corrected, and verified by a re-inspection from a licensed compliance inspector. A re-inspection may be limited to the items and equipment that were out of compliance.

  The UST section has the discretionary authority per 75-11-509(9), MCA to not renew an Operating Permit if an inspection report or other relevant information documents significant noncompliance as defined in ARM 17.56.101(63). The UST section uses the term "egregious noncompliance" in place of significant noncompliance for a facility that has been denied an Operating Permit. Egregious noncompliance is defined as any of the following:

  - The failure to comply with 1998 UST upgrade standards by not having the proper equipment installed,
  - Tank or line leak detection is not being conducted and documented, or the failure to comply with Montana UST regulations such that there is a significant noncompliance combined with additional factors

  Additional factors that may be included in determining egregious noncompliance include, but are not limited to:

  - Environmental harm resulting from a violation,
  - Violation of a an existing UST section order,
  - Number and significance of violations,
  - History of noncompliance,
  - Duration of the violation(s),
  - Willfulness or negligence, or

- Economic benefit derived from the violation.
- When an egregious noncompliant facility conducts a re-inspection showing they are in compliance with the regulation, they will then be issued an OP.

Recommended Tools.

✓ **A suggested list of items to bring to the job site can be found at the end of this manual.**

Maintenance, Repair, Upgrade: What's the Difference?

When an UST system component that is not functioning properly is discovered, is it an upgrade, repair or routine maintenance? Understanding the difference is important because the rules vary.

See https://deq.mt.gov/twr/assistance for a complete definition of what work requires a construction permit from the UST section and scroll down and select UST WORK: PERMIT REQUIRED

Known or Suspected Releases. Licensed compliance inspectors may come across an UST system that is leaking or one that has suspicious release detection readings. Know what to look for, how to act, and who to contact. ***https://deq.mt.gov/cleanupandrec/Programs/petrocleanup.***

Leak Line 1-(800)-457-0568.

An O/O of an UST system must ensure that UST systems are properly maintained, repaired and upgraded. Exactly who can perform each of these three tasks differs slightly. This section will help licensed compliance inspectors understand the requirements for each action. Please note that a permit from MDEQ/UST is required for most work to an UST system. The permit application must be submitted at least 30 days prior to starting work.

Definitions

- **Maintenance:** Means the normal operational upkeep to prevent an UST system from releasing product.

- **Repair:** Means to restore a tank or UST system component that has caused a release of product from the UST system.

- **Modification:** Means the addition or removal and replacement of an UST system component such as cathodic protection, leak detection equipment or spill and overflow devices or any other UST equipment integral to the function of the UST system. All modifications will be required to be conducted in accordance with design standards codified in DEQ administrative rule. Construction Permits will be issued to capture these design standards.

✓ **Maintenance.** The O/O, a manufacturer's representative, a general contractor, or a licensed installer is able to conduct maintenance of an UST system. Generally, like for like replacement does not require construction permit.

✓ **Repair and Upgrades.** A person licensed as an "Installer/Remover" by the UST section must perform or supervise all permitted work. Note: An individual licensed by the UST section as a

"Remover" is only authorized to permanently remove UST systems in accordance with a permit issued by the UST section.

- ✓ **Standards Followed*:*** Repairs and upgrades must be conducted in accordance with Sub-Chapter 3 of DEQs administrative rules for design standards. Upgraded and repaired UST equipment will be required to be functionally tested when completed in accordance with a permit issued by the UST section.

- ✓ **Records Maintained:** The O/O must keep records of each repair made for the remaining operating life of the UST system.

- ✓ **Forms:** The "Certification of Compliance" form, signed construction permit and all related permit documents must be completed and submitted by the UST section licensee conducting repairs/modifications and submitted to MDEQ/UST within 30 days of completing the upgrade.

Known or Suspected Release

If you observe any of the following conditions, you must report it as a known or suspected release:

- Presence of free product; soil staining or odors; surface or groundwater sheen; or petroleum vapors in a sewer, a basement, or utility lines.
- Spill or overfill of petroleum that results in a release to the environment and exceeds 25 gallons
- Sudden loss of product.
- A failed leak test result or an alarm that is not caused by an equipment failure.
- An unusual operating condition, such as unexplained water in the tank or
- piping. Erratic behavior of a dispenser.

You do not need to report a suspected release if:

- The monitoring device reporting the suspected release is found to be defective and is immediately repaired, calibrated, or replaced and
- Additional monitoring does not confirm the initial result of a release.

OR

- Activation of a leak detection equipment monitoring alarm, or activation of flow restriction mode for a mechanical line leak detector requires reporting, **unless**:
  - Within 24 hours of the occurrence of the condition, the condition is investigated, the cause of the condition is discovered, corrected, and a release to the environment or to secondary containment has not occurred;
  - The leak detection system is returned to a fully operational condition within 24 hours; and
  - Records documenting the cause of the condition and the investigative and corrective actions undertaken in response to the condition are maintained for a one-year period at the facility, or be readily available for inspection by the UST section upon request.

Who to contact in the event of a known or suspected release:

HOTLINE for Reporting Leaks

Monday through Friday 8 a.m. to 5 p.m. call 1-800-457-0568

After hours and holidays call 1-406-324-4777

NOTE: You must report to a live person.
Leaving a message does not constitute a report.

Cathodic Protection Systems

One of the more complicated problems that may be encountered during an inspection will be an UST system with a faulty or failed or inadequate cathodic protection system. A cathodic protection system may fail for a number of reasons including:

- ✓ Improper backfill material
- ✓ Failure of electrical isolation (a faulty dielectric bushing)
- ✓ Failure to activate a galvanic anode
- ✓ Improperly designed impressed current system
- ✓ Wiring failure between anode and rectifier
- ✓ Faulty rectifier
- ✓ Improperly installed anode
- ✓ Direct contact of dissimilar metals
- ✓ Uncontrolled stray currents
- ✓ Improper wire splices
- ✓ Improper wire connections to structures

Chapter 3: Filling Out the Inspection Report Forms

This chapter provides help for a licensed compliance inspector to prepare, perform, and complete the inspection report forms. Licensed compliance inspectors can refer to this chapter while on site performing the compliance inspection.

Before the Inspection Begins

✓ **Record Review.** Prior to arriving at the site, it is advisable to ask the O/O to provide or have ready at the inspection, the tank and piping information, leak detection test results (including a history of alarms and responses to them), corrosion protection test results, containment sump test results and automatic line leak detector annual testing information and a site diagram showing tank location, size and contents. Recommend verifying the facility Operating Permit expiration date found at https://deq.mt.gov/twr/assistance under UST FACILITY OPERATING PERMIT STATUS and printing the UST sections Facility Summary Sheet located at https://deq.mt.gov/twr/assistance under FACILITY SUMMARY SHEETS.

✓ **Planning Ahead.** Prior to arriving at the site, you should discuss the inspection with, typically the Class B, Operator. Explain that you will need access to the entire tank system and that you will need to speak with the person responsible for the tank operation and record keeping; that is the Class B Operator. Describe what additional records you will need to see; especially if records are kept at a different location. Ensure that the UST system Class B Operator will be available to demonstrate or explain the currently used release detection methods, provide records, open locks and sign the compliance inspection forms.

✓ **Report Submittals.** The licensed compliance inspector must submit the original inspection reports (completed and signed/initialed) to MDEQ/UST within 15 days of the completion (site visit) of the inspection by mail or submit the forms electronically by scanning and emailing to dequstprogram@mt.gov.

✓

General Information (All Pages)

This section summarizes general information about the UST inspection report forms. It also adds definitions that will help the licensed compliance inspector know what is required in a compliance inspection.

✓ **Inspection due date.** All UST systems must be inspected at least 90 days before the current Operating Permit expires. All UST systems are inspected at the same time, both active and inactive and regardless of their installation date.

✓ **Facility Visit.** A licensed compliance inspector must be physically present at the UST facility to perform the inspection. However, it may not be necessary to conduct a re-inspection on-site depending on the violation.

✓ **Compartmentalized Tanks.** A compartmentalized tank is considered a vessel; with each compartment being considered a separate tank for regulatory and fee purposes.

✓ **Filling Out the Report.** The inspection report forms must be filled out completely. Do not use pencil.

✓ **Signatures Required.** The licensed compliance inspector and the O/O must sign the front page and initial/date each applicable page. By signing or initialing each page, this certifies that the licensed compliance inspector has filled out each applicable page and the O/O has "reviewed the inspection report and been advised of deficiencies, their corrective action and other recommendations." **MDEQ/UST can reject inspection pages that are not signed or dated.**

✓ **Owner's Maintenance of Records.** The O/O (Class B Operator) is permitted to keep their records at a site other than the UST facility. This alternate location does not remove the licensed compliance

inspector's obligation to view those records. Arrangements must be made with the O/O to supply the required records, preferably before a facility site visit is made, or for the licensed compliance inspector to visit the alternate storage site. An inspection is not complete until required records are reviewed.

✓ **Report Form Version.** The licensed compliance inspector should only use the most current version of the compliance inspection report forms. MDEQ/UST will provide all licensed compliance inspectors with the most current version upon request or forms may be obtained from our web page at https://deq.mt.gov/twr/resources under UST FORMS.

✓ **Non-notified UST's.** If a non-notified UST system subject to UST regulations is discovered during the inspection, it must be inspected along with the other USTs. Indicate on the form any unregistered, regulated tanks. ***The O/O must file a Notification Form within 30 days of the discovery.***

✓ **UST's Not Required to be Inspected.** These UST's are not required to be inspected by authority of administrative rule: 1) equipment or machinery that contains regulated substances for operation purposes such as hydraulic lift tanks and electrical equipment tanks; 2) an UST system that contains a de minimis concentration of regulated substances; 3) any emergency spill or overflow containment UST system that is expeditiously emptied after use; 4) a storage tank that is situated in an underground area such as a basement, cellar, mine draft, shaft, or tunnel; 5) aboveground pipes associated with aboveground storage tanks (AST's); and 6) oil/water separators.

✓ **Above Ground Storage Tanks.** AST's with connected underground piping are regulated by the UST section and require a compliance inspection as an UST.

✓ **Multiple Piping Systems.** When a tank system has more than one type of piping system (for example: both pressurized and suction piping) use all applicable sections of the inspection report forms.

✓ **Filling Out Applicable Pages.** A licensed compliance inspector only needs to fill out the pages that are applicable to the UST system(s) present at the facility.

✓ **Maintaining Records.** There must be a record of checking for releases at least once a month. For methods that do not produce a written record, a log is an acceptable method of documenting that the method or equipment was checked as required. A release detection log must be kept for an entire year's worth of release detection results. The UST section requires that owners/operators "MONITOR" their release detection systems and evidence of monitoring resides in the record keeping requirement. More information in this regard is found on the specific inspection form page in this manual.

✓ **Equipment Meets Performance Criteria.** The licensed compliance inspector must be familiar with and determine the validity of the test or equipment by checking with the NWGLDE's "List of Leak Detection Evaluations". The UST section uses the list found at www.nwglde.org to ensure EPA performance requirements are met.

✓ **Multiple Release Detection Methods.** It is only necessary for an O/O to perform one type of release detection for a tank (except inventory control and tank tightness testing (TTT) or manual tank gauging and TTT) and may even switch methods during a 12 month period. The method, however, must be done properly and **completely**. Fill out the applicable pages used by the O/O for each method used.

Page 1: UST Notice of Compliance Inspection

✓ Compare the information provided by the Facility Summary Sheet (online at https://deq.mt.gov/twr/assistance under FACILITY SUMMARY SHEETS) with the facility configuration. The Operating Permit should also be compared to determine consistency. Provide correct information on page 1.

✓ **Incorrect Facility/UST/Owner Information.** If incorrect information is listed on the Facility Summary Sheet, the correct information should be entered on the compliance inspection form. ***The UST section will need a notification form filled out by the O/O to update the database.***

✓ **Number of UST systems at this facility.** Count all the UST's subject to inspection. When more than **5** regulated underground storage tank systems are present at a facility, it will be necessary to use more than one set of inspection report forms.

✓ **Type of Inspection.** Circle the appropriate term for the kind of inspection. If "other" include a description of the purpose of the inspection.

✓ **Date of Inspection.** List the date the inspection (site visit) was completed.

✓ **Certification.** Original signatures by the O/O and the Compliance Inspector are required along with the date of each signature at the close of the inspection. The inspection is a legal document and the signatures on it certify the authenticity of the inspection. Signatures are very important when an enforcement action is necessary.

✓ **"Please Note The Following".** It is advisable to review the contents of the six items listed under "Please note the following" with the O/O of the UST facility.

✓ **Submit inspection report.** The white pages of the signed and completed Compliance Inspection report must be delivered to the UST section within 15 days after the inspection is complete as discussed above.

✓ **Use the Latest Version.** Use the latest version of the compliance inspection forms found at https://deq.mt.gov/twr/resources under UST FORMS. The revision date is found at the bottom of each inspection page.

Page 2: UST Inspection Checklist

Compare the information provided by the Facility Summary Sheet with the facility configuration and with the Operating Permit. Does all this information agree?

Use this form to also provide information about an UST that is active, inactive or taken out of service.

- ✓ **UST Information.** If incorrect information is listed on the Facility Summary Sheet, the correct information should be entered on the inspection form. The O/O will be required by the UST section to submit an amended notification form with the correct information. This facility data summary sheet is a direct reflection of the UST database for facility configuration. Both the full Notification Form and short form version of the Notification Form for change of owner only is posted to UST section web site.

- ✓ **Tank Numbering System.** The department issues a permanent metallic tag for each UST system. The permanent tank tag must be attached to the fill pipe or other above ground component of the UST system. The tank tag is for record keeping purposes. Tank identification numbers allow the UST section to properly track each UST system at the facility. Care must be exercised during the inspection to use the tank numbers shown on the Facility Summary Sheet. **Use the tank number that the UST section assigned and no other.** When an UST system is closed at a facility, the tank number (MT Tank #) remains in the data base and is not reassigned. Each compartment of a multi-compartment tank is an individual tank or UST system and will have an associated permanent tank tag. The owner is responsible for each UST system tank registration fee. The inspector must document the compliance status of each compartment tank

- ✓ **Compatibility.** For each UST system, does the O/O certify that each UST system is compatible with substance stored? Pay particular attention to anything that would be considered biofuels. See list on inspection form. If there is any doubt about the O/O understanding and able to certify compatibility, note this on the compliance inspection form. We recommend providing to the owner a checklist found in the following EPA publication: "UST System Compatibility with Biofuels" located at: https://www.epa.gov/sites/production/files/2015-12/documents/ust_system_compatibility_with_biofuels.pdf

- ✓ **Certification of Financial Responsibility.** Owners and operators must keep certain records as evidence that they are currently meeting their financial responsibility obligations. The primary record is the Certification of Financial Responsibility. Regulations require that an updated copy of a correctly worded certification of financial responsibility is maintained. The purpose of the certification is to declare the:

  1. Mechanism of coverage,
  2. Name of issuer and,
  3. Amount of coverage

  Every O/O must complete and have on file for verification during inspection the

- https://deq.mt.gov/files/Land/UST/Documents/PDFfiles/CERTFR.pdf

- ✓ **Trained Operator.** The Energy Act of 2005 requires O/O's of UST storage tank systems to train Class A, B and C operators. Training is provided by the UST section at https://www.montanamoodle.org/?tenant=tankhelper2. This application is known as TankHelper II. The facility must provide a certificate of training issued by the training application following the successful completion of each training.

- ✓ **Status?** List whether the UST system is active (currently in use) or inactive status. Document compliance status for inactive tanks using page 1 and the Corrosion Protection page. O/O's are required to notify the UST section of a change in tank status. However, the UST section may use this inspection to change the status of a tank to inactive if not already notified by the owner.

- ✓ **Out of Service or Inactive?** An UST system is out of service when the O/O stops using it but the tank still contains product. Product is no longer periodically added to the tank or removed from it. As long as a system contains product, the O/O must perform a valid form of release detection on both the tank and piping. *A licensed compliance inspector must perform a complete inspection including, as applicable, release detection, spill and overfill prevention, and corrosion protection.* Before the end of a three-month out of service period, product in the tank system must be removed so that less than an inch of regulated substance remains in the tank. A tank taken out of service and status is "Inactive" is not required to have release detection if empty, however a compliance inspection is still required to determine if the UST meets inactive requirements. Prior to a tank system being put back into use, an O/O must obtain a Conditional Operating Permit followed by a compliance inspection and comply with other requirements.

- ✓ **Clean Spill Buckets, No Cracks or Holes.** A spill bucket that contains water, dirt or debris is not a usable spill device. The bucket may be cleaned during inspection. Then mark this question with a "YES", but note under comments that the bucket was cleaned. The licensed compliance inspector should also visually inspect the spill bucket and look for obvious signs of cracks, holes or other damage that could render the device unable to contain product. A damaged spill bucket is in violation if it cannot contain product as designed.

- ✓ **Overfill Device Installed.** Confirm through visual inspection that the tank has an overfill device and identify which type is present for each tank. If a visual inspection cannot be done, then seek other evidence to document that an overfill device was installed. For example: O/O information (receipt, invoice, warranty, photos, etc.). If visual confirmation of the overfill device may cause damage to the equipment or the UST system, use one of these alternate means of confirmation.

- ✓ **Overfill Device Not Required.** An overfill device is not required for a tank system that receives less than 25 gallons per delivery. Many used oil tanks may fall into this category.

- ✓ **High Level Alarm Only.** An inspector must also ensure the alarm can be seen or heard by a driver during delivery. If not, the alarm must be relocated, using the construction permit process where it will alert the driver when the UST system is at fill capacity.

Figure 1. High Level Alarm

- ✓ **24 hour dispensing?** If product is dispensed at times when an UST facility is unattended, there must be a method to disable the pumping system when a leak is detected. Four possibilities are:
  1) an MLLD that restricts the product flow when activated;
  2) disabling the pump with a properly programmed ATG and electronic line leak detector,
  3) disabling the pump using properly programmed ATG and sump sensors (interstitial monitoring), or
  3) an auto-dialer for **heating oil tanks & emergency power generator tanks** only. The auto-dialer must be responded to by responsible party, typically the Class B operator within 1 hour.

- ✓ **Fill Pipes With Horizontal Components.** Fill pipes with any horizontal component are considered US Suction and must have a Line Tightness Test every 3 years.

- ✓ **Vent stacks.** Make a visual estimate of the height of the vent stack above an adjacent roof or parapet wall, or if it is free standing, how high is the top of it above the ground.

- ✓ **AST.** If an AST connects to underground piping, identify the solenoid or anti-syphon valve between the tank, and the underground portion of the piping. Show the valve's location on the site diagram.

- ✓ **Failed Leak Test?** Any failed leak detection result is recorded in the UST section database based on inspection and Remediation Division will verify that suspect release is properly responded to.

- ✓ **Shear Valves Anchored?** Next to absence of tank and/or piping leak detection records, the most common UST section issued violation.

<u>Spill and Overfill Problems - common problems:</u>

- ✓ no external alarm for an overfill alarm system (alarm should be able to be heard by the delivery driver – alarm does not serve its purpose if it only sounds inside the building)
- ✓ alarm disconnected
- ✓ dirt, trash or water/snow in spill bucket
- ✓ ball float valve in vent riser pipe damaged
- ✓ overfill device is set at wrong tank capacity
- ✓ inoperative overfill device
- ✓ damaged spill bucket

Page 3: Farm, Residential, Heating Oil & Emergency Generator Tanks

This form is used to document observations of a regulated UST system, less than **1100 gallons** capacity:

1. At a farm or residence, or
2. That contains heating oil, or
3. That is connected to an emergency generator.

Compare the information provided by the Facility Summary Sheet with that provided by the O/O with that observed at the site with the Operating Permit. Does all this information agree?

Use this form to provide information about these types of UST systems that is out of service but not yet fully to "inactive status". If an UST is out of service or discovered during inspection, it must be inspected.

Do not mark a "YES" or "NO" if the question does not apply.

- ✓ **Capacity.** The volume of the tank must be 1100 gallons or less for the use of the "annual 36-hour tank gauging" release detection method. If the volume of the tank is larger than 1100 gallons, then another approved tank release detection method must be used.

- ✓ **No Evidence of a Release.** Based on the results of the annual stick test, a visual inspection for stains and odors, indicate whether or not there is any evidence of a release or suspected release from each tank.

- ✓ **Deficiencies, Corrections and Recommendations.** The comment section should be used if any of the questions are answered with "NO". This section should also be used to describe any problems noted during the inspection, even those that were corrected. Any portion of the UST system that was adjusted or fixed should be noted. Any recommendations provided by the licensed compliance inspector to the O/O should be listed.

COMMON PROBLEMS

- ✓ not gauging the tank at required times
- ✓ not gauging the tank through a drop tube
- ✓ not using a tank stick calibrated to 1/8 of an inch increments
- ✓ not reconciling at the end of the test period (this is what tells if there is a leak)

Page 4: Manual Tank Gauging (MTG)

The licensed compliance inspector must answer each question for an UST system that uses MTG.

- ✓ **MTG Allowed?** For many USTs, December 22, 1998 marked the end of the use of the combination of an annual TTT and MTG to meet release detection requirements. Use the chart below to determine if the tank may use MTG and TTT (at 5-year intervals) and for how long.

Nominal Tank Capacity (in gallons)	MTG Valid Until:
110 → 550	Tank is removed
551 → 1,000	for 10 years after installing a new tank or upgrading an old tank with corrosion protection
1,000, 64 inch dia.	Tank is removed
1,000, 48 inch dia.	Tank is removed
1,001 → 2,000	for 10 years after installing a new tank or upgrading an old tank with corrosion protection
2,001 +	Not Allowed

- ✓ **Piping.** The use of manual tank gauging does not meet release detection requirements for piping. Pressurized and US suction piping must use other methods of leak detection such as interstitial monitoring.

- ✓ **A Difference.** Although there are many similarities in technique between MTG and Inventory Control, these are two different tank release detection methods.

- ✓ **Weekly Measurements.** Make sure that the O/O takes measurements every week.

- ✓ **Monthly Reconciliation.** Many UST systems have MTG data that has not been reconciled to determine if a leak may have occurred from a regulated tank. ***Monthly reconciliation validates the method. MTG data must be reconciled each month to prove passing tank leak detection, even if there is a passed tank tightness test.***

- ✓ **Monthly Variation Acceptable.** Because of the statistical nature of this type of release detection, the O/O is allowed a certain amount of monthly variation. Please refer to the weekly and monthly standard variation on the table below.

- ✓ **Proper Level Measurements Taken.** Refer to the chart below to make sure the O/O is taking measurements at the correct time interval, depending on the size and diameter of the tank.

Tank Size	Minimum Duration Of Test	Weekly Standard Variance (1 test)	Tightness Test Required	Monthly Standard Variance (4-test average)
110 - 550 gallons	36 hours	10 gallons	NO	5 gallons
551-1,000 gallons (when tank diameter is 64")	44 hours	9 gallons	NO	4 gallons
551-1,000 gallons (when tank diameter is 48")	58 hours	12 gallons	NO	6 gallons
551-1,000 gallons	36 hours	13 gallons	YES	7 gallons
1,001-2,000 gallons	36 hours	26 gallons	YES	13 gallons

- ✓ **Two Consecutive Readings.** To be statistically valid, the O/O must take two consecutive readings and take an average of the two. If the O/O has not been doing this, the O/O must be instructed on correct procedures and must start doing measurements correctly.

- ✓ **Gauging Stick Okay.** The tank should be measured using a fuel gauge stick that is calibrated in 1/8" increments and should measure the full height of the tank for accurate measurements. If not, then the stick is defective and must be replaced.

- ✓ **MTG Acceptable.** Please refer to the following list of statements to see if MTG is an acceptable method of release detection.

  a) MTG can only be used on tanks 2,000 gallons or smaller.

  b) Certain sized tanks can use MTG alone.

  c) Certain sized tanks can use MTG only when it is combined with periodic tank tightness testing. The combined method of MTG and tank tightness testing is a **temporary** release detection method. The O/O can use the combined method only for 10 years after installing a new tank that has corrosion protection or for 10 years after upgrading an old tank with corrosion protection. During this 10-year period, tanks need tightness testing every 5 years. After the 10-year period, the O/O must change to a monthly monitoring method, such as ATG, statistical inventory reconciliation (SIR) or interstitial monitoring (ISM) (see the chart on page 16 for exceptions).

- ✓ **Tank Tightness Testing.** Depending upon when the tank was installed or when corrosion protection requirements were met, a tightness test may have been required within the past 5 years. If not, the licensed compliance inspector must inform the O/O that a tightness test is required to complete the inspection.

- ✓ **12 Months Prior Data.** Make sure the O/O has a copy of the previous 12 months' MTG data. Generally, this means looking at the inventory sheets reconciled each month. If the O/O is not doing MTG correctly, they must start doing it right.

- ✓ **Passing leak detection (LD) data not available.** For each tank**,** circle the months that do not show properly reconciled or passing MTG data.

- ✓ **Deficiencies, Corrections and Recommendations.** The comment section should be used if any of the questions are answered 'No.' This section should also be used to describe any problems noted during the inspection, even those that were corrected. Any portion of the UST system that was adjusted or fixed should be noted. Any recommendations provided by the licensed compliance inspector to the O/O should be listed. Use Page 15, Field Inspection Report for additional comments.

COMMON PROBLEMS

- ✓ not gauging the tank at required times
- ✓ not gauging the tank through a drop tube
- ✓ not using a tank stick calibrated in 1/8 inch increments
- ✓ not taking two initial stick readings and not taking two end stick readings
- ✓ not reconciling at the end of the month (this is what tells if there is a leak)

Page 5: Automatic Tank Gauging (ATG)

The licensed compliance inspector must answer each question for an UST system that uses an ATG as the primary form of leak detection.

- ✓ **Make and Model of ATG.** The inspector must document the make and model of the ATG on all applicable department inspection forms. The inspector must verify that the ATG console has power to it and ensure that the power light is on, to confirm that the tank gauging equipment is functioning. A tank gauge that is turned off and neglected is not considered a valid applicable leak detection method.

- ✓ **Documentation.** The O/O should have a copy of the ATG manual operations manual. ATG's programming and operating characteristics change depending on software version. It may be possible to find the correct software version if the O/O does not have the proper paper copy. If not, the O/O should be instructed to contact the manufacturer and obtain a copy on-line or otherwise.

- ✓ **Performance Standards Met.** An ATG (and other release detection equipment and test protocols) may only be used if it meets EPA protocol for evaluating leak detection methods and is found to meet EPA performance standards. Refer to the latest version of NWGLDE's document "List of Leak Detection Evaluations" found at www.nwglde.org . *Every Inspector should obtain a copy or save as a bookmark.* Acceptable equipment is documented on this list.

- ✓ **What does "Primary" mean?** Many UST systems in Montana employ more than one leak detection method. The method used to meet the performance requirement and monthly monitoring requirements for leak detection (both tank and piping) will be declared by the O/O using this compliance inspection as the "primary" method for regulatory purposes.

- ✓ **What does "Monthly Monitoring" mean?** The department definition and application of monthly monitoring requires a facility operator to **visually check** the status of all tank or piping leak tests at least once a month to monitor the status of each leak detection system (pass, fail, invalid, etc.) and keep a record of the results. Monthly monitoring records must be available to the UST inspector during any UST compliance inspection conducted by department inspectors and/or department licensed third party inspectors.

  The following scenario demonstrates how to properly apply the department definition of "monthly monitoring" as it relates to conducting UST field inspections: A UST facility is using a Veeder Root ILS 350 ATG (Veeder Root ILS 350 ATGs conduct interstitial monitoring only). This tank gauge has the capability to continuously monitor liquid sensors and respond to any liquid once a sensor's threshold level has been exceeded. One model of sensor will alarm if it is raised from the bottom of the containment vessel as well. The liquid sensors must be installed at the lowest point of the containment enclosure to ensure early detection of liquids in an interstitial space. The sensors must be properly placed in containment sumps such as transition and dispenser sumps. This tank gauge however, does not have a printer. Therefore, the operator must keep a record (i.e. log) of the monthly status checks of the equipment by writing down the status of sensors. A proper written log of required monthly leak tests are "all functions normal' or "liquid sensor normal".

- ✓ **Disable the Pumping Apparatus.** IF the equipment is capable such that there is a solenoid on the high voltage side of the ATG, then the ATG must be programmed to disable the pumping

apparatus. If the equipment is not capable (no solenoid or ability to control the STP) then this is not a violation.

- ✓ **Leak Detection Records.** The last twelve consecutive months ATG test results must be reviewed and evaluated. The UST section uses the evidence of records that the O/O is MONITORING each UST system on a monthly basis. Items of concern are:

  - **24 Hour UST systems.** Some ATGs needs a minimum amount of "quiet" or static time where no fuel is added or subtracted in order to run a valid test. It may not be possible to get a valid reading at an UST system open 24 hours a day, thus invalidating release detection data. Make sure that if an UST facility is open and accessible 24 hours a day that there is sufficient "quiet" time to get a valid test.

  - **Two Types of ATGs.** There are two types of ATGs. One requires a shut down or quiet time to run the leak test. The product volume must be about 50% of tank capacity for these units to conduct a valid test. The second type (CSLD) statistically analyzes several short glimpses of quiet time. The tank does not require extended "quiet time" for these units to perform a 0.2gph leak test.

  - **Tank Size**. Using the latest version of NWGLDE's document "List of Leak Detection Evaluations", ensure the ATG is appropriate for the particular size of the UST.

  - **Ullage:** The product in the UST should be filled to the level required by the ATG manufacturer to produce valid monthly test results. Additionally, the tank portion that must be tested must be that portion that **routinely** contains product. This may not be at 90% full.

- ✓ **"Monitor" AND the Periodic 0.2 gph Leak Test.** An ATG is typically programmed by installers to conduct a weekly 0.2 gph leak test. The ***printed results from the ATG of the 0.2 gph leak tests provide the record that evidences an owner is "MONITORING" to fulfill the monthly leak detection monitoring requirement.***

- ✓ **12 Months Prior Data.** The O/O must have ATG test result data for the previous 12 months. Again, the owner must "MONITOR" the test results. Monitoring means examination of printouts for each tank for each month. If the ATG is functioning properly, but the O/O cannot show proof of some or all of the previous 12 months leak detection monitoring, the UST section will issue a CAP that will document minor, moderate or major violation depending on the number of missing leak detection records. The O/O must immediately begin tracking ATG readings at least monthly. Select the months for which passing leak test results are not available.

- ✓ **No Records, But an ATG History Report Exists:** An ATG history printout is not sufficient to document monthly leak detection monitoring. The principle behind monthly leak detection is to test and monitor for leaks at least monthly.

  An ATG printout showing that there were no leaks within the last year does not document monthly checks. **If you don't observe a monthly record in the O/O files, then the O/O cannot be**

performing monthly leak detection. Document on the inspection form in the row provided that there are no monthly release detection records and that you have printed out a history of the leak detection results and what the results are. The UST section will document a "moderate" violation if the O/O is only able to provide an ATG history report for leak detection records and will issue a CAP that requires 12 months of printed records be provided.

- ✓ **No Evidence of a Release.** Based on the result of ATG records indicate whether there is any evidence of a release or suspected release from each tank. Failed leak test results should have been investigated to identify the problem. Suspected releases should be called in to DEQ leak release hotline. If a compliance inspector finds evidence of a release, it must be reported immediately

- ✓ **Deficiencies, Corrections and Recommendations.** The comment section should be used if any of the questions are answered "NO". This section should also be used to describe any problems noted during the inspection, even those that were corrected. Any portion of the UST system that was adjusted or fixed should be noted. Recommendations provided by the licensed compliance inspector to the O/O should be listed.

PROBLEMS

- ✓ Not properly programmed to conduct a test at least once a month
- ✓ Not monitoring system test results evidenced by lack of 12 months of test records.
- ✓ Not responding to alarms
- ✓ Not following maintenance and calibration schedules
- ✓ Product level during a completed test is not within the test method standards

Page 6: Interstitial Monitoring for Double Walled Tanks

Complete this form if the tank uses interstitial monitoring as the primary form of release detection. The compliance inspector must answer all the questions.

- ✓ **What does "Primary" mean?** Many UST systems in Montana employ more than one leak detection method. The method used to meet the performance requirement and monthly monitoring requirements for leak detection (both tank and piping) will be declared by the O/O using this compliance inspection as the "primary" method for regulatory purposes.

- ✓ **How is Interstitial Space Monitored?** A licensed compliance inspector must be able to access the equipment that tests the tank's interstice. There are two methods of Interstitial Monitoring:
    - **Manual.** If the equipment is manual, the licensed compliance inspector must document that the O/O is maintaining a log of monthly readings maintained by the O/O. The log must indicate that the O/O is MONITORING the tank interstice for the presence or absence of liquid, the date of observation and the initials of the person who did the monitoring. The licensed compliance inspector should have the O/O perform a manual test of the interstice to ensure log readings are valid and to evaluate the technique used. Monthly monitoring records are required for compliance.
    - **Electronic.** If equipment is electronic, the licensed compliance inspector would look for a sensor or probe that detects the presence of liquid. The report may be logged manually as above, or printed out if a printer is connected to the console. Typically, the owner will record "All Functions Normal" that is indicative of no sensor in alarm status if the O/O is maintaining a valid inspection log.

- ✓ **Disable the Pumping Apparatus. IF** the equipment is capable such that there is a solenoid on the high voltage side of the ATG, then the ATG must be programmed to disable the pumping apparatus. If the equipment is not capable (no solenoid or ability to control the STP) then this is not a violation.

- ✓ **12 Months Prior Data.** The O/O must have the previous 12 months of release detection printed records or console operational check for Interstitial Monitoring. O/O's often believe that having a double wall tank guarantees a no-leak tank and there is a tendency to ignore monthly testing.

- ✓ **Tank Excavation Liners.** Some tank basins are lined with an impervious membrane to contain any leaks. Some form of monitoring well will be present and may be monitored using a stick, or with an electronic probe that reports to an ATG console. Monthly monitoring is required and documentation must be provided in a manner similar to other interstitial methods.

- ✓ **Periodic Equipment Maintenance.** Records must be available to show that maintenance, calibration and functionality checks are routinely performed as required by the manufacturer.

Page 7: Leak Detection for Piping

Pressurized Piping

- ✓ **Pressure Piping Requirements.** Pressurized piping systems require two methods of release detection. An O/O must have a method for detecting large leaks (≥3.0gph) and another approved method for detecting small leaks (≤0.2gph). The automatic line leak detector (ALLD) must have performance specifications that show it will detect a 3 gph leak at 10 pounds per square inch (psi) within 1 hour. Verify the equipment using the latest version at http://www.nwglde.org

Pressurized Piping Release Detection: What's Required		
Pressurized piping must have two different types of release detection, one from SET 1 and one from SET 2.		
Set 1 (catastrophic)		**SET 2 (precision test or monthly method)**
❑ Mechanical Line Leak Detector	AND	❑ Annual 0.1gph line tightness test
❑ Electronic Line Leak Detector		❑ Monthly monitoring; for example SIR
OR		
Continuous Interstitial Monitor with STP shutdown or Auto-dialer (heating oil or emergency power generators only)		

- ✓ **Mechanical LLD.** Approved MLLDs will restrict the flow of product so that an attendant will be notified by a customer. List the make/model of the MLLD.

- ✓ **Functionality Check.** All ALLDs must have a functionality check **as required by the manufacturer** of the device. Typically, manufacturers of MLLDs require an annual functionality check while manufacturers of ELLDs do not require a quantitative functionality check. **VERIFY** that the O/O has a certification from an individual certified in the equipment he/she is using that documents the functionality check if required. **Montana administrative rule requires that the ALLD must be replaced if tested and the device does not properly respond to a flow rate that exceeds 5 gph.**

- ✓ **Disable the Pumping Apparatus.** Typically, ELLDs control the submersible turbine pump. Incon stand-alone ELLDs are the exception. Ensure that the ATG is programmed to accomplish the disable if the ELLD is able to shut down the pumping apparatus.

- ✓ **Continuous Interstitial Monitoring.** Montana accepts liquid level sensors in sumps that are monitored by an ATG continuously to meet the 3 gph catastrophic leak requirement. The sensors must be located at a low point in the sump and trigger an alarm or auto-dialer or shut off the turbine when liquid is detected in the sump.

Precision Test or Monthly Method

- ✓ **Annual precision Line Tightness Test.** An annual precision line tightness test (LTT) must be in accordance with approved manufacturers who meet the required EPA performance requirements of 1.1 gph. Check www.nwglde.org for approved list. An annual test otherwise known as a precision LTT must be accomplished by a certified tester and the results must be part of the facility's recordkeeping, if the annual precision test is the primary method used as a substitute for a monthly monitoring method. Include the date and results of the most recent test. Document if the test is

more than one year old. This will be a major violation that must be corrected 14 days prior to the current OP expiration date.

- ✓ **Precision LTT performed by the ELLD.** Many ELLDs are capable of a 3.0 gph (catastrophic leak test, each time fuel is dispensed,) a 0.2 gph leak rate test and a 0.1 precision LTT. If an ELLD is certified to perform the precision test, and if the facility has a record of a passing 0.1 LTT within a year, the annual precision test requirement is satisfied in lieu of a monthly test at 0.2 gph rate. However, we recommend the ELLD be programmed to conduct a monthly 0.2 gph test and typically they are set up to do this. The test results are available in the data stored by the ATG console. Record the date of the test and leak rate of the most recent passing, precision, 0.1 piping leak test (or 1.2 gph test) for each UST.

- ✓ **Periodic 0.2 gph Leak Test.** The past twelve months of 0.2 gph leak test records must be available at the time of inspection. If any month does not have a passing periodic line leak test result, select that month for the appropriate tank.

AST with underground piping systems

An underground piping system connected to an aboveground storage tank (AST) is regulated as pressurized piping. Also, piping is considered pressurized whenever any portion of the underground piping is lower than the level of product in the tank. Gravity causes product to flow into the piping system and the weight of the column of product exerts hydrostatic head pressure on the inner surface of the piping. Hydrostatic head pressure exists whether the piping is attached to the bottom of a tank, or through the top of a tank as in a siphon system.

Gasoline and diesel fuels exert approximately 3.5 psi (pounds per square inch) of hydrostatic head pressure for each 10 feet drop in elevation. Thus, if the fuel level in an AST is 8 feet above the ground surface, and the underground piping from the tank is buried 2 feet deep, then the pressure within the underground piping is approximately 3.5 psi. Hydrostatic pressure within an underground piping system is not significantly changed by the presence of a “suction pump” at the dispenser-end of the piping.

Many UST facility owners/operators insist that their system is “suction” because they have a “suction” pump in the dispenser. In this case, the use of the term “suction pump” is incorrect. In a gravity flow system that has a pump at the dispenser, the pump pressurizes the delivery hose between the dispenser and a vehicle being filled, it does not create a vacuum or suction in the underground piping coming from the tank. The underground piping between the tank and the dispenser is constantly filled and pressurized by hydrostatic head pressure, whether or not the dispenser pump is operating. UST systems that are located at an elevation that produce a gravity head on an underground piping system shall comply with the following requirements to ensure that releases due to siphoning are prevented. The tank outlet shall be equipped with a device, such as an anti-siphon valve or a normally closed solenoid valve, which is approved by the department and designed to prevent the contents of the tank from entering the environment if a leak develops in the piping system. This device shall be positioned as close to the tank as possible, and it shall be installed and adjusted so that liquid cannot flow by gravity from the tank if any part of the piping system fails. Without an anti-siphon prevention device, an elevated tank could release the entire contents of the tank into the environment whenever a leak develops in any portion of the underground piping system. UST systems that are located at an elevation that produce a gravity head on an underground piping system shall also meet the departments catastrophic piping leak detection

requirement and utilize a monthly piping release detection method (or have a 0.1 gph line tightness test conducted annually). Please see the figure below to learn more about the equipment installed on these types of systems.

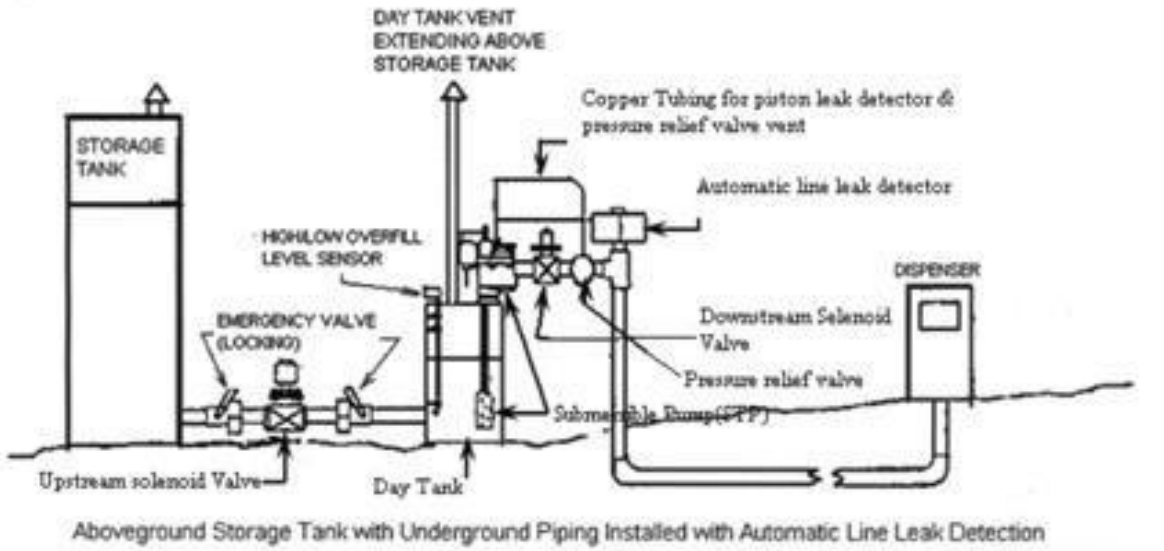

Figure 1. AST with underground piping example

Suction Piping Systems

✓ **Suction Piping Requirements.** Suction piping systems can be divided into European (Safe) and American or US Suction type systems. The testing requirements depend upon the type of system.

European (Safe) Suction		**American (US) Suction- single line systems (i.e. no return line)**
Construction: • Below-grade piping operates at less than atmospheric pressure, and • Piping sloped so contents will drain back to tank if suction is released, and • No more than one check valve located as close to the pump as practical, and • Designed so that the above can be readily determined. Testing: • No testing or devices are required. Erratic behavior of a dispenser must be investigated.	**OR**	Construction: • Below-grade piping operates at less than atmospheric pressure, and • Piping does not slope so contents will drain back to tank if suction is released, or • A second check valve is in the piping or a check valve is in the piping and a foot valve is in the tank. Testing: • Line tightness test (0.1 gph) every 3 yrs; **or one of the following** • Monthly monitoring (i.e. ISM), • SIR

Heating Oil & Emergency Generators

Heating oil and emergency generator tanks can be the source of a lot of confusion, due to their complex pumping and piping systems. This can lead to further confusion when implementing Underground Storage Tank (UST) rules. These tank systems pull fuel from the tank intermittently through two lines, the supply and return. Fuel that isn't burned in the generator or boiler is run back to the tank through the return line. Below is a photograph of a typical supply and return line for an emergency generator or heating oil tank system (figure 3).

Figure 2: Typical supply and return line for an emergency generator or heating oil tank system

Three Types of Piping System with Emergency Generators/HO USTs

There are three types of piping systems that emergency generator tanks and heating oil tanks utilize. The department generally refers to these tank/piping systems as U.S. Suction systems. We must, however, look at the supply and the return lines to determine what the department requires for piping leak detection.

✓ **Version One**

Figure 3 shows the fuel is dispensed at a higher elevation than the top of the tank. The supply line slopes back to the tank and the return is gravity fed. The supply line is "Safe Suction" if the only check valve is located at the generator. "Safe Suction" means that the product is moved at less than atmospheric pressure, that the system has only one check valve located near the pumping system, and all piping slopes back to the tank. All three of these requirements must be verifiable in order for an inspector to designate a piping system as "Safe Suction". "Safe Suction" supply lines do not require leak detection because in the event that a hole develops in the piping; the pump will lose its prime, and the product in the line will run back to the tank. This kind of piping system acts like a drinking straw. If a hole is present in the straw, the straw will not draw liquid. The return line is gravity fed and if a leak develops in this line, a large amount of product could be released into the environment. The only leak detection requirement on the return line is a 0.1 gph line tightness test, mandated to be conducted at least once every three years. Some facilities choose to conduct monthly interstitial monitoring in lieu of the line tightness test.

See next page for Figure 3.

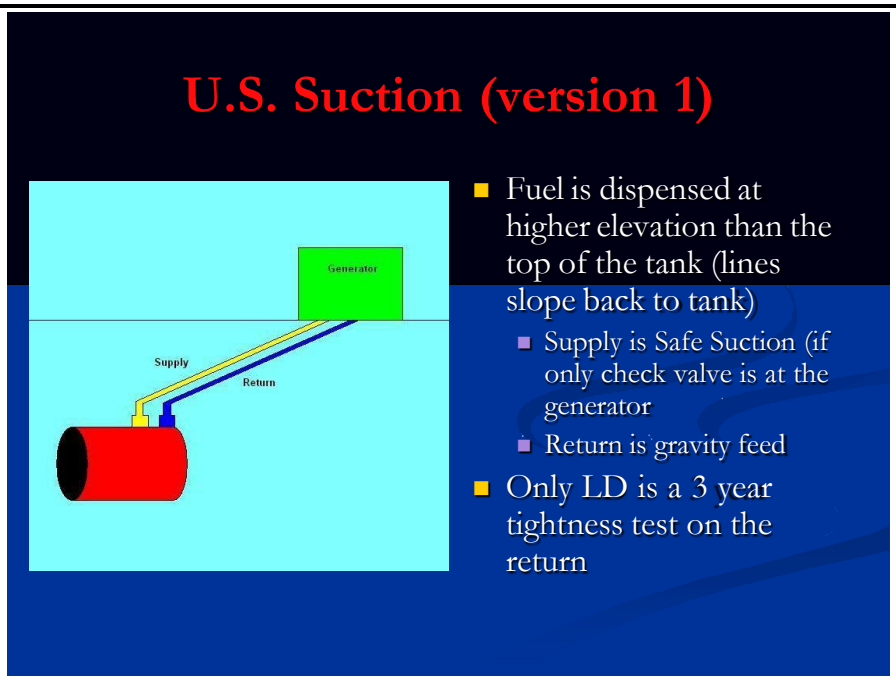

Figure 3: U.S. Suction (version 1)

✓ Version 2

Version 2 (Figure 4) is a U.S. suction system used with heating oil or emergency generator tanks where fuel is dispensed at a lower elevation than the tank top. None of the underground lines slope back to the tank. The supply line consequently operates at more than atmospheric pressure and is therefore designated as "pressurized". The pumping system must pump product from the generator or boiler back up to the tank (at more than atmospheric pressure) through the return line.

The return line is designated as "pressurized". If either the supply or return develops a hole in the piping system (in this example), a leak to the environment would occur. As a result, the piping system outlined in version 2 requires a continuous method of piping leak detection. These types of systems have double walled piping and continuous interstitial monitoring sump sensors wired to a tank gauge via a relay that will shut down the pumping system if a leak is detected. The department approves using an auto-dialer to meet this shutdown requirement, for emergency generators and heating oil tanks. Auto-dialers communicate with the owner or tank operator when a sensor detects product or goes into alarm. The Class B Operator is must respond to an alarm situation within one hour to meet department requirements.

See next page for Figure 4.

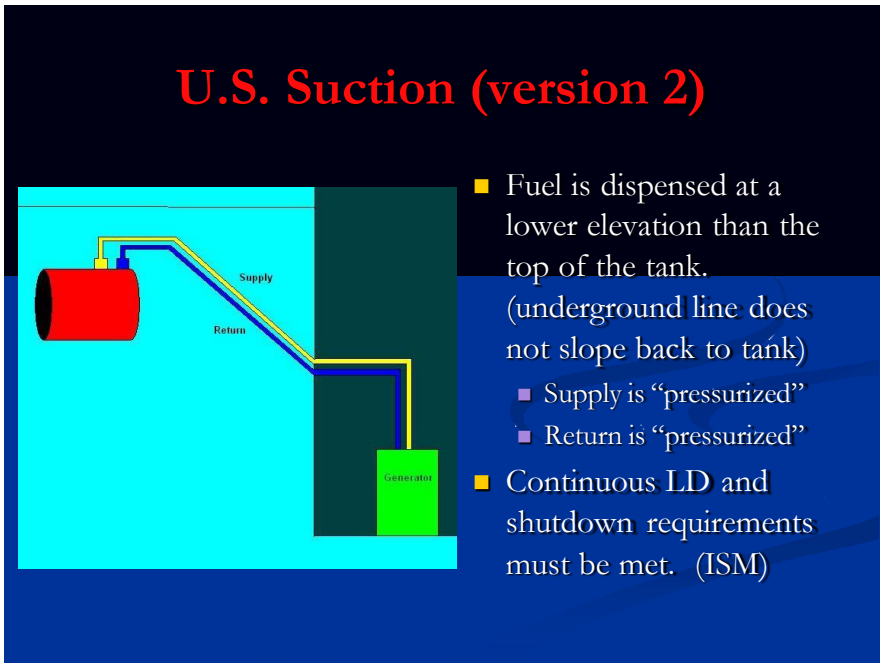

Figure 4: U.S. Suction (version 2)

✓ Version 3

The last type of U.S. Suction, version 3 is shown by Figure 5. In this case, the underground portion of the supply line slopes back to the tank and is designated as "safe suction". As the supply line enters the building, it slopes down to the generator and boiler. If the supply line has a leak, product would either run back into the tank or run inside the building. No harm to the environment would occur if the supply line developed a leak. The return line is designated as a "gravity feed" because the pumping system must push the product from the generator or boiler back up to the tank. Once the fuel enters the portion of the piping that is underground; gravity is the primary force that takes the product back to the tank. If a leak occurred in the return line, the fuel would either pour into the building or it would enter the environment. This type of U.S. suction system is very common in schools across Montana. The only piping leak detection requirement is a 0.1 gph line tightness test conducted on the return line at least once every three years.

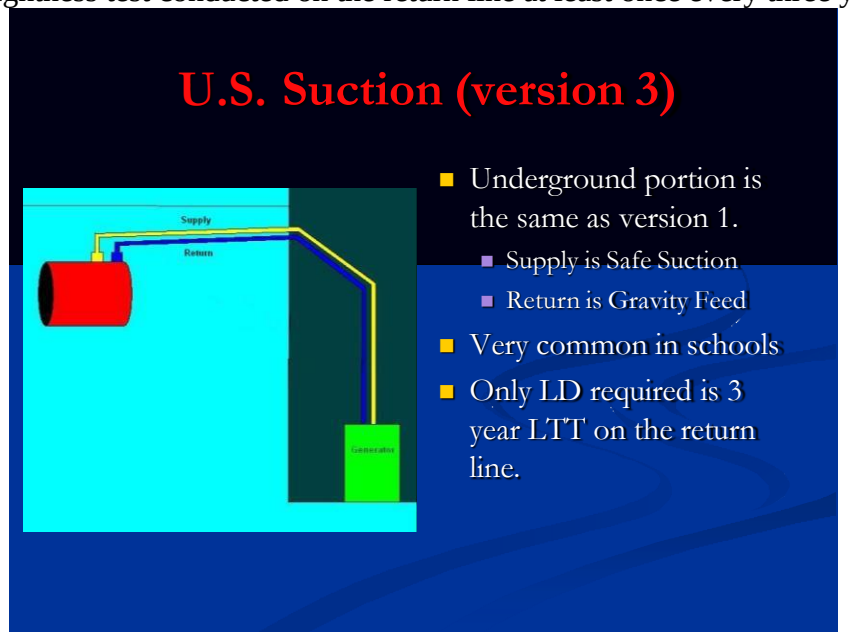

Figure 5: U.S. Suction (version 3)

- ✓ **Gravity-Fed Systems are not Safe Suction Systems.** For a system to be fed by gravity, the tank must be higher than the point where product is dispensed. Even though the dispensing unit may use a "suction" pump, the system is really operating under the hydrostatic head of the liquid in the product line. Leak detection may be accomplished by a double walled piping system checked at least monthly, or a specialized pumping system with a MLLD. See the MDEQ/UST brochure entitled "Automatic Line Leak Detectors in Aboveground Storage Tank Systems with Underground Piping."

- ✓ **Suction Piping.** Determine whether the system is safe suction or US suction. Use visual inspection where possible and confirmation of the piping, literature review and best professional judgment.

- ✓ **Ball Float Valves.** Ball float valve overfill prevention does not function properly on UST systems with suction piping. If a ball float valve is present in a suction system, it must be removed and replaced by a high level alarm or a positive shutoff device in the fill pipe's drop tube. If an air eliminator is present, the ball valve need not be removed.

- ✓ **0.1 gph Line Tightness Test**. US suction systems may use a precision LTT every three years as leak detection in place of a monthly method. The system must have a passing 0.1line tightness test done within the past three years. Enter the date of the last line tightness test and the leak rate for each tank.

- ✓ **Comments.** Use page 15 also, the Field Inspection Report for any detailed comments on piping leak detection.

Page 8: Interstitial Monitoring for Double Walled Pipes

- ✓ **Interstitial Monitoring and Pressure Piping.** Interstitial monitoring (ISM) is the required method of monitoring for newly installed pipes (and tanks). In Montana, an ISM system by itself will satisfy both catastrophic and monthly leak detection regulatory requirements. Thus, an ALLD is not required. But, as mentioned previously, many UST systems are installed with ELLDs to avoid containment sump testing requirements.

  Many older UST systems also use ISM; but are not usually installed with ALLDs. Older systems are typically poorly constructed and designed with inferior materials (Total Containment). Carefully inspect these older systems for piping failures inside the sumps. Failures are typically observed at the swaged fittings located at the pipe ends.

  If an ALLD is not installed, ISM systems must disengage the submersible turbine pump; trigger a continuous alarm that is RESPONDED to by the Class C Operator, or use an auto-dialer to meet the catastrophic leak detection requirements. The continuous alarm and auto-dialer options (second and third listed) are only allowed for emergency generators and heating oil UST systems. All other UST systems must update their equipment to meet the catastrophic piping leak detection requirements. These facilities must install Electronic Line Leak Detectors (ELLDs) or Mechanical Line Leak Detectors (MLLDs) to meet this requirement.

- ✓ **Console Make and Model.** Document it.

- ✓ **What does "Primary" mean?** Many UST systems in Montana employ more than one leak detection method. The method used to meet the performance requirement and monthly monitoring requirements for leak detection (both tank and piping) will be declared by the O/O using this compliance inspection as the "primary" method for regulatory purposes. Only one method is required as the primary method of leak detection for piping. Back up methods should also be fully operational, but one method is declared as the primary method. 12 consecutive months of monitoring must be documented for the primary method.

- ✓ **Containment Sump Testing.** For a pressurized piping system where ISM is primary (line item 1), all containment sumps must be functionally tested every 3 years.

  An O/O of an UST who conducts piping interstitial monitoring as the primary leak detection method shall conduct one of the following tests to determine liquid tightness:

  (a) hydrostatically test all containment sumps once every three years with liquid for one hour to a height six inches above the highest sump penetration. A passing test must show no liquid loss measured during the testing interval;
  (b) vacuum or pressure test containment sumps in accordance with the testing equipment manufacturer's instructions and pass/fail requirements; or
  (c) functionally test containment sumps as recommended by the manufacturer of the containment sump.

  An O/O who conducts a containment sump test pursuant to (2) shall report a failed test to the UST section.

- ✓ **Who Conducts Tests?** Containment sump testing that is required must be accomplished by a licensed installer or compliance inspector **only.**

- ✓ **Continuous Interstitial Monitoring (CISM) Operational Checks.** With CISM, ATGs monitor whether the console is connected and responsive to electrical signals from each installed containment sump sensor. Typically, the status is reported on the LCD panel is "All functions Normal". This indicates that all sensors are operational. If the console does not have a printer such that you are able to verify monthly console checks, then a written log of the console status each month with the date and initials of the observer satisfies monthly recordkeeping is required. Verify monitoring is occurring each month for UST's in active status. The Class B Operator must demonstrate that the system is being "monitored".

  Below is an example of a Veeder Root TLS 350 ATG monitor printout report showing a sensor out alarm for the liquid sensor labeled L6. The L6 sensor is not currently functioning or is not sending a signal to the ATG console. The VR TLS 350 operator manual lists the sensor reference designation for "L" as a "Liquid Sensor" (If it was listed as a "T", it would indicate an "In-tank probe"). Such an alarm condition must be addressed and corrected. The sensor is not functioning properly and therefore the operator is not able to properly conduct interstitial monitoring of this sensor until corrections are made. If the condition of the sensor cannot be corrected then the sensor must be replaced.

```
OCT 18. 2005  9:55 AM

  SYSTEM STATUS REPORT
- - - - - - - - - - - -
L 6:SENSOR OUT ALARM

LIQUID DIAGNOSTIC
- - - - - - - - - - - -

L 6:DISPENSER 3-4 SUMP
  SAMPLES=          5
 LOW REF1=        164
HIGH REF1=        951
   VALUE1=     103197
```

Sensor out Alarm

- ✓ **Liquid Level Sensors in Interstitial Sumps.** The sensors must be positioned at the low point of the sump and able to detect a 3.0 gph leak within one hour. This requires calculations in some cases and UST systems permitted by the UST section are assumed to be in compliance with this requirement.

  Verify that the liquid level sensors are properly installed. Most sensors are suspended from other hardware in the sump by a plumber's strap. Sensors are installed incorrectly if suspended by the small electric wire that also connects the sensor to the console.

- ✓ **Functionality Test.** Manufacturers require an annual functionality test for liquid sensors. Ensure that each sensor has been or will be checked for operability during the compliance inspection.

- ✓ **Disable the Pumping Apparatus.** If the equipment is capable such that there is a solenoid on the high voltage side of the ATG or a relay that can communicate with the STP, then the ATG must be programmed to disable the pumping apparatus when an alarm condition is activated. If the equipment is not capable (no solenoid or ability to control the STP) then this is not a violation. It is important to note, that the UST facility must met the departments' catastrophic piping leak detection requirement regardless of the capability of their equipment.

- ✓ **Manual Visual Monitoring.** In ISM systems where there are no electronic sensors in the sumps, the Class B Operator or another person, must physically remove the sump covers monthly, and look in the sump to see whether any fuel is present. These visual inspections must be logged with the date, initials of the sump inspector, and an accurate description of whether there is fuel or water in the sump. Your inspection verifies the operator (or Class B Operator) inspected each sump.

- ✓ **Documentation.** Monitoring must be proven by documentation that the system is functional is monitored regularly. Verify that records properly document monthly checks. If any months do not show operational checks, select the month on the inspection form.

- ✓ **Failed Results.** If a licensed compliance inspector discovers a failed test result when reviewing the 12 months of release detection data this should be noted on the inspection form. If a release is suspected to be on-going, the licensed compliance inspector should tell the O/O to notify the Petroleum Release Section, if not already done. Failing to report a suspected release may alter the facilities reimbursement schedule approved by the Petro Fund.

- ✓ **Secondary Barriers.** Secondary barriers are lined excavations, not double walled tanks or pipes. Secondary barriers are rare in Montana; less than 5 UST systems in Montana. If the O/O uses a secondary barrier (i.e.: tank pit liner) as the primary or sole source of release detection for tanks, information on the following items should be obtained. *This does not apply to tanks with factory constructed interstitial spaces.*

  a) **Thickness of Barrier:** What is it?
  b) **Compatibility:** Barrier must be compatible with petroleum products stored and the petroleum product must not cause deterioration.
  c) **Corrosion Protection:** Barrier must not interfere with cathodic protection system.
  d) **Testing:** Groundwater, soil moisture, or rainfall cannot render testing or sampling inoperative so a release could go undetected for more than 30 days.
  e) **Groundwater:** Unless designed for such use, a barrier must always be above the groundwater level.
  f) **Monitoring Wells.** Barrier wells must be properly constructed and clearly marked.
  g) **Barrier Material:** What is it?

- ✓ **Operational Leak Detection Equipment.** Verify that equipment related to piping leak detection is operational. While checking sumps note whether there is liquid in the sumps. If it is fuel, a suspect release is to be reported by the O/O. If it is water, it may interfere with leak detection equipment. In either case, it should be called to the operator's attention to have the liquid removed and the source identified.

- ✓ **Deficiencies, Corrections and Recommendations.** Describe any problems with interstitial piping leak detection on page 15, Field Inspection Report. Any portion of the UST system that was adjusted or fixed should be noted. Any recommendations provided by the licensed compliance inspector to the O/O should be listed.

Interstitial Monitoring - common problems

- ✓ not keeping a written log of the monthly checks (manual)
- ✓ sensor not functioning (electronic)
- ✓ not testing or measuring every 30 days for Manual ISM

Page 9: Vapor Monitoring

Fill out this section if the tank or piping or both uses vapor monitoring as a release detection method. This form can also be used to document deficiencies in well construction even if a vapor well is not used as a release detection method. **Monitoring wells must be properly constructed for release detection.**

Vapor Monitoring is used to detect petroleum vapors in the soil surrounding an UST system. The petroleum product must be sufficiently volatile to form vapors. Diesel is not an acceptable petroleum product for use with this method. For this method to be effective, wells are installed in the porous backfill material surrounding the tank or piping. This method of leak detection (out of tank leak detection) is not preferred and is being phased out in our next set of rule changes.

- ✓ **Background Contamination.** Six background vapor readings taken at least one week apart are needed to establish a baseline. Monthly readings from each well are compared to the baseline established for that specific well for a significant change in vapor concentration. A significant change must be reported to DEQ/PRS as a release.

- ✓ **Monitoring.** Operation of the vapor detection system is required once a month. No hand held vapor monitoring devices are approved for leak detection.

- ✓ **Security.** The well cover must be secured (bolted down) or the well cap must be locked. The well cover must be marked with a black equilateral triangle on a white background and have a suitable warning ("Do Not Fill", "Observation Well", "Monitoring Well", etc.).

- ✓ **Construction.** Is the well cap tight? Is a concreted surface can present? Is there a 12 to 24 inch thick bentonite seal atop the PVC monitoring well pipe? Are factory slots present below 12 to 24 inches of solid pipe? Is there a bottom cap?

- ✓ **Equipment.** Vapor monitoring equipment involves a permanently installed apparatus that continuously or periodically gathers and analyzes a vapor sample. The response to a release may be a visual or an audio alarm. No hand held equipment is approved for Vapor Monitoring.

- ✓ **Calibration.** The equipment used must be calibrated periodically according to the manufacturer's instructions. Records of calibration must be kept.

- ✓ **12 Months Prior Data.** The O/O should have readings for the past 12 months for each well when Vapor Monitoring is used for leak detection. A log must be kept to show monthly monitoring. Observations should be dated and initialed and a note made of the "reading."

- ✓ **Most Recent Vapor Reading.** Record the most recent month's vapor reading for each tank (or for each well) and express the reading in ppm. This gives DEQ/UST a periodic reference against the baseline. Many devices do not show vapor in ppm; they are mechanical in that petroleum vapors dissolve a strip causing a weight to drop that operates a color indicator, changing it from green to red.

Page 10: Groundwater Monitoring

Fill out this page if the tank or piping or both uses groundwater monitoring as a release detection method.

This method is used to detect liquid petroleum product floating on the water surrounding an UST system. The petroleum product must float on the surface of the groundwater. Gasoline and diesel #2 or lighter are acceptable petroleum products for use with this method. Normally for this method to be effective, wells are installed in the porous backfill material surrounding the tank or piping. This method of leak detection (out of tank leak detection) is not preferred and is being phased out in our next set of rule changes.

- ✓ **Make of Sensor or Equipment Used for Testing.** Note whatever kind of equipment is used to monitor the presence of petroleum on the ground water.

- ✓ **Background Contamination.** Groundwater Monitoring <u>may not be used if there is any soil contamination.</u>

- ✓ **Monitoring.** Operation of the detection system is required once a month. A log must be kept that shows the date of each test, the results of the test and the initials of the tester.

- ✓ **Manual Equipment.** Manually operated equipment involves a simple bailer (clear, re-useable is acceptable if cleaned properly in between uses) that is used to collect a sample of groundwater. A measurable amount of product in the bailer or even a slight sheen must be reported to DEQ/PTS as a release.

- ✓ **Electronic Equipment.** An electronic device can also be inserted into the well to continuously monitor for the presence of leaked product. The response to a release may be a visual or an audio alarm.

- ✓ **Security.** The well cover must be secured (bolted down) or the well cap must be locked. The well cover must be marked with a black equilateral triangle on a white background and have a suitable warning ("Do Not Fill", "Observation Well", "Monitoring Well", etc.).

- ✓ **Water Level.** There must be at least five feet of water present in the well and the water level must be no more than 20 feet below the ground surface. Also, the water cannot be above the slotted section of the well casing.

- ✓ **Construction.** Is the well cap tight? Is a concreted surface can present? Is there a 12 to 24 inch thick bentonite seal on top the PVC monitoring well pipe? Are factory slots present below 12 to 24 inches of solid pipe? Is there a bottom cap?

- ✓ **Calibration.** The electronic equipment used must be calibrated periodically according to the manufacturer's instructions. Records of calibration must be kept.

- ✓ **12 Months Prior Data.** The O/O should have readings for the last 12 months for each well as part of Groundwater Monitoring. If the system is functioning properly, but the O/O cannot show proof of the previous 12 months, they shall immediately begin monthly groundwater monitoring readings logging each well monthly.

Page 11: Inventory Control and Tank Tightness Testing

Fill out this section if the O/O uses inventory control (IC) and TTT as the UST system primary release detection method. The licensed compliance inspector must fill out each question on the form for an UST system that uses IC and TTT. This method of tank leak detection is being phased out and is rarely seen today.

- ✓ **IC and TTT Allowed?** For many UST's, December 22, 1998 marked the end of the use of IC and TTT to meet tank release detection requirements. IC and TT may be used as a leak detection method until 10 years after a tank installation or tank upgrading with corrosion protection. Use this chart to determine if the tank can still use IC and TTT and for how long. ***Note that after August 24, 2007 all new installations must employ interstitial monitoring for both tank and pipe leak detection. As of January, 2014, there are less than 5 facilities in the state that use Inventory Control as a valid form of tank leak detection at an active facility.***

Questions	Answers	
Does the **tank** have corrosion protection (and, if so, when installed)?	You can use inventory control plus:	
	Tank tightness testing annually	Tank tightness testing every five years
No	**Through 12/22/98**	No
Yes (tank installed with corrosion protection on or before 12/22/1988)	N/A	**Through 12/22/98**
Yes (tank installed with corrosion protection after 12/22/1988)	N/A	Only for 10 years after installing a new tank that has corrosion protection.
Yes (corrosion protection, such as an impressed current system, installed on a previously unprotected steel tank)	N/A	Only for 10 years after upgrading an old tank with corrosion protection.

Example: A 10,000-gallon unprotected steel tank with fiberglass piping was upgraded on 9/30/1998. Upgrading included the addition of cathodic protection for the tank. The O/O may use IC until 9/30/2008. At that time, the O/O must switch to another approved form of release detection for the tank. Under this example, a TTT will be due on 9/30/2003 and 9/30/2008.

- ✓ **Third Party Approval.** A tightness testing method may only be used if it is tested by a third party evaluator and is found to meet minimum industry performance standards. Check NWGLDE's "List of Leak Detection Evaluations" at www.nwglde.org .

- ✓ **Last Tightness Test Data.** If a tightness test has been done in the last 5 years, another one is required 5 years after the last one. The licensed compliance inspector should inform the O/O if a tank tightness test must be done before the inspection is complete. Make sure to note the date of the last tightness test.

- ✓ **ATG Monitoring.** Inventory Control data may be obtained from an ATG.

- ✓ **Readings Recorded Daily.** Successful release detection using IC usually depends on whether an O/O is performing good daily readings. Review all the release detection data and make sure it is being done and properly logged. If the O/O is not keeping a formal log, the O/O should obtain an IC form.

- ✓ **A Difference.** Although there are many similarities in technique between MTG and IC, these are two different tank release detection methods.

- ✓ **Monthly Reconciliation.** Many owners and operators of USTs have inventory control data that is not routinely reconciled to determine if a leak may have occurred. *The last twelve consecutive months of data must be properly reconciled, and meet the appropriate standards even if there is a passed tank tightness test.*

- ✓ **Calibration Chart.** A calibration chart must be present and used to convert stick readings into gallons. If the calibration chart is not present or is not being used, the O/O should immediately contact the tank manufacturer for a copy. Document if the O/O is not using a calibration chart. *The Inspector should verify that the tank chart used is the correct one for each tank. (Suggestion: calibration chart software is available from industry associations.)*

- ✓ **Stick Readings for Deliveries.** In order for IC to work properly, the O/O must take a reading and record each delivery on an IC form.

- ✓ **Gauge Stick.** The tank must be measured using a fuel gauge stick that is calibrated in 1/8-inch increments for accurate measurements. If not, the O/O should immediately obtain a gauging stick that has this capability.

- ✓ **Water Measurements.** The amount of water in the tank must be measured and recorded each month to the nearest 1/8". This information must be used in calculating inventory balances. If water is not properly measured, then the O/O must begin doing so immediately. Water finding paste is used to measure for the presence and depth of water in the tank.

- ✓ **Totalizer.** Each pipe (supply, and if applicable, return) must have a totalizer that is accurately calibrated (to within 6 cubic inches for every 5 gallons dispensed) in order for the IC tank release detection method to work. *An UST system tank without a totalizer cannot use IC.* If the totalizer is missing, then the O/O must begin using another type of release detection. The totalizer must have a current calibration sticker from Weights and Measures, Department of Commerce, or other approved source. Readings from a mechanical or electronic totalizer are acceptable.

- ✓ **12 Months Prior Data.** Make sure the O/O has a copy of the previous 12 consecutive months of IC data. Generally, this means looking at the inventory sheets for each month for each tank. If the O/O cannot show proof of the previous 12 months data, or if the O/O is doing IC incorrectly, they must immediately start doing it right. It will take six months of passing IC records to avoid enforcement.

- ✓ **Overages/Shortages.** IC regulations allow for overages or shortages each month, not to exceed 130 gallons plus 1% of the tank's monthly flow through. The licensed compliance inspectors should double check the calculations on the IC form for the last twelve months of results and confirm that this amount has not been exceeded.

- ✓ **Drop Tubes.** Drop tubes are required for release detection when using IC to help stabilize fuel for an accurate product level measurement. Without a proper drop tube, the UST system is out of compliance.

Tightness Testing

- ✓ **No Leak.** Based on the results of IC (and TTT if applicable), indicate whether or not there is any evidence of a known or suspected release from each tank.

- ✓ **Inventory Control/TTT.** If the tank has not passed a TTT within the past five years, the UST system is not in compliance.

- ✓ **Deficiencies, Corrections and Recommendations.** The comment section should be used if any of the questions are answered with "NO". This section should also be used to describe any problems noted during the inspection, even those that were corrected. Any portion of the UST system that was adjusted or fixed should be noted. Any recommendations provided by the licensed compliance inspector to the O/O should be listed.

Inventory Control - common problems:

- ✓ not gauging the tank every operating day
- ✓ not gauging the tank through a drop tube
- ✓ not using a tank gauge stick calibrated to 1/8 of an inch increments
- ✓ tank gauge stick worn down at bottom or too short to measure full height of tank
- ✓ not checking for water once a month and writing it down
- ✓ not recording all deliveries
- ✓ not reconciling at the end of the month (this is what tells if there is a leak) or doing calculations wrong
- ✓ not testing the dry portion of the tank (ullage test) while conducting the required TTT
- ✓ not reconciling deliveries with fuel receipts
- ✓ not having a totalizer
- ✓ not having a calibrated totalizer

Page 12: Statistical Inventory Reconciliation

The licensed compliance inspector must fill out each question on the form for an UST system that uses SIR as a tank and/or pipe release detection method.

- ✓ **SIR General.** SIR used for leak detection must have a valid manufacturer's certification of performance. The owner and operator should have the SIR vendor provide instructions on how to collect data. Inventory data must be collected according to SIR provider protocol. SIR is **not** a valid method of leak detection unless it is done according to the SIR provider's instructions.

- ✓ **SIR Results.** The vendor's SIR report should clearly state that the tank "Passed," "Failed," or received an "Inconclusive" result, etc.

- ✓ **Results other than a "PASS".** One month of SIR data without a "PASSING" leak test report is a reportable suspected release.

- ✓ **Third Party Approval.** SIR may only be used if the SIR method is tested by a third party evaluator and found to meet minimum industry performance standards. Check the latest version of NWGLDE's "List of Leak Detection Evaluations" online.

- ✓ **SIR for Piping.** If the O/O uses SIR for piping, verify that the applicable SIR protocol evaluates piping. If the SIR method does not evaluate piping, then the piping fails release detection and another approved method must be used.

- ✓ **Readings Recorded Daily.** Successful release detection results from accurate measurements on a daily basis. Review the release detection data and make sure it is being done and properly logged. The tank may be measured using a fuel gauge stick that is calibrated in 1/8 inch increments for accurate measurements.

- ✓ **Calibration Chart.** A calibration chart must be used to convert stick readings into gallons. *The licensed compliance inspector should verify that the tank chart used is the correct one for each tank (calibration chart software is available online).*

- ✓ **Stick Readings for Deliveries.** In order for SIR to work properly, the O/O must take readings and record this information for each delivery.

- ✓ **Other forms of gauges** can also be used if they are available and in good operating condition. ATGs, for instance, can simplify measuring tank volumes. (Keep in mind, of course, that some ATG systems can serve as acceptable monthly tank leak detection methods by themselves.) Whatever form of gauge you choose to use, you must follow the SIR vendor's instructions carefully to gather useful data. For instance, many providers of SIR services require that the tank measurements are made to the nearest 1/8-inch. If you fail to follow the vendor's instructions, you may end up with inconclusive test results.

- ✓ **Calibrating Dispensing Meters.** A poorly calibrated totalizer can produce bad data that may be mistaken for some types of releases. While many SIR vendors can identify this pattern as a possible cause for a result of FAIL or INCONCLUSIVE, it is wise to avoid the problem entirely. Advise the O/O to keep dispensers in good operating condition and have them periodically recalibrated as recommended by the equipment manufacturer and as required by state and local weights and measures agencies.

- ✓ **Water Measurements.** The amount of water in the tank is measured each month to the nearest 1/8". That information must be used in calculating inventory balances. If water is not properly measured, then the O/O must begin doing so immediately, if this information is required by the SIR vendor.

- ✓ **12 Months Prior Data.** Make sure the O/O has a copy of the previous 12 consecutive months of SIR data. Generally, this means looking at the SIR test reports and related documents for each tank for each month.

- ✓ **Drop Tubes.** Drop tubes are required for release detection when using SIR to help stabilize fuel for an accurate product level measurement when not using an ATG.

Statistical Inventory Reconciliation (SIR) - common problems:

- ✓ not using a third party approved vendor
- ✓ not collecting data according to vendor's instructions
- ✓ not following the SIR vendor's procedural recommendations for proper daily readings

Page 13: Corrosion Protection

All metallic components that is contact with the ground AND routinely contain regulated product must have corrosion protection (CP). UST components that do not require CP when in contact with the ground are vent lines and tank risers because these components do not ROUTINELY contain product.

Use this section to summarize the inspection information about the CP system, even if the tank or pipe is made of non-metal materials.

Tanks: Non-Metal Materials: Fiberglass, Fiberglass-Clad Steel, or Polyethylene Jacketed

- ✓ **Non-Metal Materials:** CP testing is not required for tanks or piping made from a non-metal material. Examine records provided by the O/O, thoroughly, to confirm the construction materials.

Piping

- ✓ **Product Pipe.** Check what you see at the site against the facility summary report to verify that DEQ has correct information.

- ✓ **Flex Connectors.** Flexes will be installed between rigid pipe and equipment such as turbines and dispensers. These flexes are usually visible and the inspector can see how they are protected. No metallic component should be in contact with the ground, or if they are, then CP must be applied and tested.

Impressed Current Cathodic Protection

- ✓ **Impressed Current.** Confirm that the impressed current system is powered and functioning. If the rectifier is turned off at the time of inspection, the inspector should note it on the inspection report. The compliance inspector must inform the O/O that the rectifier must be on at all times.

- ✓ **60 Day Log.** The O/O must provide the licensed compliance inspector with two of the last three required passing 60-day rectifier examination readings results.

- ✓ **Records.** The O/O should provide the licensed compliance inspector with the results of the last CP test, if applicable. If the CP test results are not available, note it in the comment section of the inspection form.

Cathodic Protection Test

- ✓ **Date of the last CP Test.** The date the CP test was completed.

- ✓ **Corrosion Protection Test.** Provide a copy of the most recent comprehensive CP test report for the tank and piping conducted by a qualified CP tester to MDEQ/UST. Note: Only a qualified corrosion protection tester (a person currently certified in UST cathodic protection testing by or with NACE certification) may perform testing. ***All cathodic protection tests on tanks must include readings at each end, each side and at the top center of each tank. Piping tests must be done every 20' of piping length.***

- ✓ **Metallic Components evaluated.** Metallic components must measure a voltage reading of -850 mv or more negative or 100-mv shift based on native soil. Inspectors must verify that all pertinent parts of the UST system are tested.

- ✓ **Failures.** If a CP test shows a failure, it is beyond the scope of a licensed compliance inspector to repair or replace the defective parts at the time of inspection. If corrosion design work is involved to correct the failure, only a "corrosion expert" may do the design work. A licensed UST installer is required to install the CP system. A permit is required for this work. Contact MDEQ/UST immediately or go to the website at https://deq.mt.gov/twr/assistance to obtain a permit application.

- ✓ **"Corrosion Expert."** A person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

- ✓ **Deficiencies, Corrections and Recommendations.** Document issues with the CP system in the comment section. Any portion of the UST system that was adjusted should be noted. Recommendations provided by the licensed compliance inspector to the O/O should be listed.

Cathodic Protection – common problems:

- ✓ galvanic anode not activated at installation
- ✓ impressed current system not turned on
- ✓ no cathodic protection on piping (product and flexes)
- ✓ not recording rectifier readings every 60 days (impressed current only)
- ✓ not conducting a cathodic protection test every three years thereafter
- ✓ not servicing the CP system if weak CP readings are discovered
- ✓ not having a qualified CP tester conducting the CP test
- ✓ faulty wiring (improper burial depth or construction or damaged wires) for an impressed current system
- ✓ irregular or non-uniform readings for impressed current

Page 13: General Site Plan

Show the location of tanks, product piping (if known), fill pipes, risers, dispensers, vents, monitoring points for cathodic protection, location of monitoring wells, and buildings on the property side. Clearly label these items and provide permanent tag numbers, tank size and product contents for each tank. Relocate or have the O/O relocate the permanent tank tags to the correct tank if necessary.

These drawings do not need to be to scale or artistic. Clarity and accuracy are the most important components of the site diagram.

Page 15: Field Inspection Report

This form allows the licensed compliance inspector an area to elaborate on the compliance inspection.

The compliance inspector should use this page to:

1) List deficiencies and problems observed during the inspection.
2) Advise owners and operators where corrective action may be required.
3) Specify information/documentation required to complete the compliance inspection.
4) Clarify issues with comments if space was not available on other individual form sheets.
5) Make other comments or observations the inspector feels are pertinent to the inspection.

CHAPTER 5: General Information

Miscellaneous

- ✓ **Submitting Forms.** All inspection forms must be submitted to the UST section by the licensed compliance inspector within 15 days of the site visit. Inspection forms are to be filled out completely, including the dated signatures and initials of the compliance inspector, and the O/O. All inspection related forms must be emailed to dequstprogram@mt.gov or mailed to the following address

  State of Montana
  Department of Environmental Quality
  Underground Storage Tank Section
  PO Box 200901
  Helena, MT 59620-0901

- ✓ **Early Inspections.** We encourage inspections be submitted as soon as possible and certainly before 90 days prior to expiration of Operating Permit so that O/O have ample time to identify and correct violations before the current OP expires. Remember, a construction permit may be required to correct violations.

- ✓ **Early Inspection Submitted 6 Months in Advance.** Compliance inspections submitted more than 6 months prior to the expiration of the current Operating Permit will have as the date of the inspection plus 3 years for the assignment of the expiration of new OP. This means, get the inspection in early, but not too early.

- ✓ **Pre-inspection.** Pre-inspection of a facility is allowable and encouraged.

- ✓ **Compliance and Corrective Action Plans.** UST section staff will review the Compliance Inspection to determine compliance and assign corrective action due dates by which corrective action must be completed as discussed in Chapter 2.

- ✓ **IMPORTANT: Petro Board and Facility Violations.** It is important to understand that if a facility is identified with violations, the Petro Board is authorized to make determinations with regard to facility reimbursement schedule when a facility applies for clean-up funding. Say for example, a facility applies for clean-up funding from the Petro Board and at the time of release, the facility is in violation as a result of a compliance inspection (CAP is issued by the UST section), then the board may decide to reduce the claim REIMBURSEMENT by any percentage amount. This is critically important to the O/O and is something that we recommend you discuss with the O/O subsequent to the inspection so O/O's understand the ramifications of violations.

- ✓ **Incomplete Compliance Inspection documents.** Fill out each required form completely unless a question is obviously not applicable to the system. Items on the Compliance Inspection Report that are incomplete or unclear will require follow up by the UST section technical staff reviewer. The reviewer will research the facility file, call or email the inspector and/or the O/O to clarify the item. ***The reviewer may also create a Corrective Action Plan that documents missing items on the compliance inspection.*** An incomplete compliance inspection will require the inspector's follow up by the facility owner to resolve unknown or incomplete issues.

- ✓ **Signatures.** Original signatures are required on Page 1 of the Compliance Inspection Report. It is a legal document, and it is incomplete if dated signatures are not present. These inspection reports may be forwarded to the UST section by email or faxed into the UST section. It is also helpful to print your name, as inspector, and also have the owner/operator print their name.

Other Forms

Notification for Underground Storage Tanks

- ✓ **Change of Ownership of an UST Facility:** If the owner is not the person or legal entity listed on the current Notification Form, then the new owner must complete, sign and submit this form to the UST section within 30 days of any change in UST facility ownership. Use the short form for a change in ownership, when that change is the only modification to facility status.

Notification of Inactive Status of Underground Storage Tanks or Piping (UST) Systems

- ✓ **Inactive Status:** This form must be completed, signed and submitted to the UST section within 30 days by the O/O if an UST is discovered to be out of service and within 90 days emptied of contents.

  ALL OF THE ABOVE FORMS ARE AVAILABLE AT: **https://deq.mt.gov/twr/resources under UST FORMS.**

Licensed Compliance Inspector Qualifications

In order to qualify to become an UST licensed compliance inspector, you must meet the following criteria:

1. A natural person at least 18 years old.
2. Submit a completed license application to the UST section.
3. Pay the appropriate license and examination fee ($100).
4. Successfully complete the licensure examination. This examination consists of a written test and a practical field test. A score of at least 80% must be obtained on the written test for licensing.

To qualify for licensing, an applicant for a compliance inspector license must have completed an inspector training course approved by the UST section that includes training in the operation and maintenance of release detection, corrosion protection, spill and overfill equipment; regulatory compliance; and field testing of inspection abilities.

A compliance inspector license is valid for three (3) years and must be renewed annually by February 28th of each year with a $100 renewal fee. During this three-year period, the compliance inspector must obtain at least 16 hours of continuing education. At least 8 hours of this continuing education must be obtained by attending an eight-hour comprehensive compliance inspector training class.

If you have questions about eligibility requirements, contact the MDEQ/UST office at (406) 444-5300.

General Duties

The licensed compliance inspector should be familiar with the following guidelines. This list is not a job site checklist, but rather a summary of general duties.

1. Be on the job site when the inspection is being conducted;
2. Review release detection documents;
3. Examine and document the presence of release detection;
4. Review the last 12 months of release detection data;

5. Ensure release detection devices are operating properly;
6. Inspect and verify that spill and overfill devices are present and functioning properly;
7. Inspect the impressed current cathodic protection system logs and equipment;
8. Inspect the galvanic cathodic protection system;
9. Sign and submit to O/O the applicable completed inspection report forms provided by MDEQ/UST;
10. Review the inspection report with the Class A or B Operator.

Note: Licensed compliance inspectors are not to adjust an ATG, rectifier or other equipment.

Care must be exercised when opening lids, covers, etc., to not damage UST system components.

Be aware of hazards (electrical, lifting heavy objects, traffic, fire, confined spaces, etc.).

Impartiality

Licensed compliance inspectors are expected to be impartial third parties who perform an objective, independent assessment of an UST system. They note deficiencies, correct them if qualified and with a permit from the UST section if required.

False Statements

The inspection report forms are legal documents. The licensed compliance inspector must sign and initial (as appropriate) and date each form to indicate that the information is true. Reports that contain incorrect information may lead to enforcement or disciplinary actions by the UST section. Submitting false documents may lead to suspension or revocation of your UST compliance inspector license. Submission of false documents may also result in criminal prosecution.

Internet Resources

The links shown below provide information that is useful in the performance of your duties as well as others outside the government having an interest in UST issues. Links to external sources is not an official MDEQ/UST endorsement of the opinions or ideas expressed therein, nor does MDEQ/UST warrant the accuracy of any of the information provided.

Government Links

- ✓ **MDEQ, Underground Storage Tank Section:** https://deq.mt.gov/twr/Programs/ust
- ✓ **Tank Helper (Operator Training):** https://www.montanamoodle.org/?tenant=tankhelper2
- ✓ **OUST** - US EPA Office of Underground Storage Tanks: https://www.epa.gov/ust

Helpful Links

- ✓ **The National Work Group on Leak Detection Evaluations (NWGLDE) "List of Leak Detection Evaluations"** at www.nwglde.org
- ✓ **API -** American Petroleum Institute: http://www.api.org
- ✓ **ASTM** - American Society of Testing and Materials: www.astm.org/index.html
- ✓ **ASTSWMO** - Association of State and Territorial Solid Waste Management Officials (Tanks Subcommittee): http://astswmo.org/tanks

- ✓ **ICC -** International Code Council: http://www.iccsafe.org/cs/CSC/Pages/default.aspx
- ✓ **NEIWPCC** - New England Interstate Water Pollution Control Commission: www.neiwpcc.org
- ✓ **NACE** - National Association of Corrosion Engineers: www.nace.org
- ✓ **NFPA** - National Fire Protection Association: www.nfpa.org
- ✓ **PEI** - Petroleum Equipment Institute: www.peinet.org
- ✓ **STI -** Steel Tank Institute: www.steeltank.com
- ✓ **UL** - Underwriter's Laboratory: www.ul.com
- ✓ **Ken Wilcox & Associates** - http://www.kwaleak.com/leaklist.htm

Tank Trade and Industry Links

- ✓ **NACS** - The National Association of Convenience Stores: www.nacsonline.com
- ✓ **PMAA** - Petroleum Marketers Association of America: www.pmaa.org

Resources and References

This section is to provide the licensed compliance inspector with additional points of contacts regarding the private UST compliance inspection program.

DEPARTMENT OF ENVIRONMENTAL QUALITY

WUTMB Bureau (406) 444-5300

Emily Ewart, UST Section Supervisor (406) 444-4194

THE MONTANA STATE LEGISLATURE https://leg.mt.gov/

Legislative Services Division (406) 444-3064
(Can leave a message if you are unable to contact your representative locally.)

MONTANA PETROLEUM MARKETERS ASSOCIATION

Brad Longcake, State Executive (406) 438-1276

Inspection Tools

Inspection Equipment

- Pry bar for lifting manhole covers; you may want an assortment of sizes.
- Hand tools
- Assorted screwdrivers, wrenches, socket set (for recessed monitoring well cover bolts), and a pocket knife.
- Fill pipe wrench - For inspecting old tanks with odd covers or fuel oil tanks, odd waste oil tanks, or pipes in the ground that might have been connected to tanks abandoned long ago.
- Flashlight - For looking down fill pipes, monitoring wells, sumps, inside dispensers, etc. Make sure it's explosion-proof!
- Rags for cleaning equipment and your hands.

- Measuring tape to measure the depth of wells. A weight on the end is useful as a sounder or splasher to tell you where the liquid level is.
- Equipment for documenting your inspection
- Camera and film for overall views of the site and to record visible violations.
- Measuring wheel for drawing site diagrams.

Safety Equipment

Protect yourself. Here are some items you can use:
Traffic cones or yellow plastic tape attached to saw horses to mark off your work area.

- Orange safety vest
- Hard hat (for construction sites)
- Steel-toed boots
- First-aid kit
- Gloves