



## Maine Department of Environmental Protection

### Aboveground Storage Tank Inspector

#### REFERENCE HANDBOOK March 2011 Edition

### General Instructions

State law and Department regulations require submittal of an inspection report for underground product piping and Stage I vapor recovery associated with all aboveground motor fuel tanks. Motor fuel tanks consist of those tanks that store gasoline, diesel, biodiesel, aviation gasoline, jet fuel, gasohol or other fuels used in the operation of a vehicle or motor engine. The annual inspection report must certify that all components have been inspected and any deficiencies have been corrected. The Department of Environmental Protection does not accept failing Annual Inspection results (except for failing cathodic protection results).

The AST Annual Inspection Report and Summary Report must be used to document the following activities: Testing of underground piping leak detection equipment, Stage I vapor recovery equipment and cathodically protected piping.

All work associated with testing of equipment and checking of procedures must be performed under the direct, onsite supervision of a Maine certified underground storage tank installer or a Maine certified underground storage tank inspector. Testing must be done in accordance with manufacturer's instructions and the instructions below.

Annual Inspections are required to be conducted every twelve (12) months. The tank owner is responsible for submitting a copy of the passing AST Inspection report to MeDEP within thirty (30) days after the inspection is completed. An Annual Inspection is not completed until all items are passing. Completed AST Annual Inspection Reports and Summary Reports should be mailed to Annual Tank Inspections, Maine Department of Environmental Protection, 28 Tyson Drive, 17 State House Station, Augusta, ME 04333. The facility owner must keep a copy for their facility records. The MeDEP strongly recommends the tank inspector also keep a copy for their records. As a courtesy, the tank inspector may send a copy of the report to the Department.

The inspection form is available in *Microsoft Excel 2003*, and *Adobe Acrobat (PDF)* formats. The PDF version of the inspection form is designed to be printed and then filled-out by hand. The Excel form is an auto-fill form that carries over registration number, date, tank number, volume, product, and in the case of the LLD section, pump type from the summary page onto the following pages.

**Note:** The Excel form includes instructions for its use.

## **Inspection Summary**

You must complete the appropriate sections of the Annual Inspection report before you can complete the Inspection Summary Report.

At the top of the summary page, print the facility name, location (city or town), owner, operator, MeDEP registration number and the telephone number of the owner. Fill in the tank and chamber # for each tank you inspect as they are identified in the MeDEP's registration information. Indicate the volume, product stored, and pump type (e.g. pressurized, suction, siphon to Tank "X", suction and return, etc.) in each tank or chamber. If you use the new Excel form, this information will be carried over onto the worksheets automatically.

For compartmented tanks, list each compartment separately (i.e. 7-1, 7-2). Use an additional sheet if you inspect more than four (4) tanks or chambers at a facility. If you are unsure of the tank number or chamber number, check the facility Registration Certificate on site or contact the Department. Registration information can also be found on the Department's website at:

[www.maine.gov/cgi-bin/online/tanksmart/step01.cgi](http://www.maine.gov/cgi-bin/online/tanksmart/step01.cgi)

For every row, check the appropriate box to indicate whether each tank Passed or Failed. If the tank is not required to use that method of leak detection, Stage I vapor recovery or cathodic protection then check N/A – Not Applicable.

For each tank that passes, check "PASS" at the bottom of the column. If the tank fails any of the inspections listed above, the inspection report cannot be finalized.

There are two signature lines. The inspector must sign and date the first signature line of the Summary report after completing the inspection. If the facility passes or all deficiencies (failures) have been corrected the inspector must sign and date the second signature line of the Summary report. The second signature line cannot be filled out until all deficiencies have been corrected.

## **What if the facility FAILS the inspection?**

Department regulations require prompt repair or replacement of all deficiencies.

Aboveground Storage Tank (AST) facilities are required to submit a passing Annual Inspection to the Department every year. There is no need to submit failing Annual Inspections results, except for failing cathodic protection results on the piping. Items that are failing must be repaired within thirty (30) days or the owner must notify the Department. In certain situations DEP may allow more time to make repairs.

**Passing inspection reports must be submitted to DEP within thirty (30) days after the inspection is completed.**

## **AST Annual Inspection Report**

This section includes instructions for inspecting each of the systems listed in the Annual Inspection Summary Report. In the spaces provided at the top of each page, enter the date of the inspection and the facility registration number.

For each tank's underground piping, you will need to inspect the electronic interstitial monitoring system unless the piping is considered to be a "safe suction system". The facility registration certificate will indicate what method of leak detection is registered with the MeDEP. If you are unsure of what the registered method of leak detection is please contact the MeDEP and ask to speak with someone in the Tanks Unit at (207) 287-2651.

Leak detectors, anti-siphon valves, Stage I vapor recovery and crash valves should also be inspected. Check subsequent sections of this Handbook for each one to determine whether the tank is required to have that system in place.

Use an "X" or a "✓" in the appropriate column to indicate whether the answer is PASS or FAIL for each applicable question. If there are more than four (4) active tanks at a location, use additional pages.

Only the AST Annual Inspection Report pages you have completed need to be submitted.

Questions are numbered in order. If you need more information about a particular question call 1-800-452-1942 or (207) 287-2651 and ask to speak to someone in the Tanks Unit.

### **Piping Interstitial Monitoring**

Fill out this section for each facility where any part of the facility's piping system is secondarily contained.

**Note:** Dispenser monitoring is contained in this section.

**Item 1: Electronic Monitoring Make and Model?** Enter the make and model number of the system in the space at the top of the section.

**Item 2: Electronic Monitoring Yes (Y) or No (N):** Indicate whether the piping system has electronic monitoring or the piping system does not have electronic monitoring.

**Note:** As of January 1, 2011, all underground piping associated with aboveground motor fuel tanks must meet current leak detection standards; i.e., double-walled piping with continuous electronic monitoring or "safe suction". Please be aware, "safe suction" piping systems on ASTs are very rare. Almost all piping associated with motor fuel ASTs are required to be double-walled with continuous electronic monitoring.

**For Electronic Systems:**

**Item 3: Monitoring console is fully operational?** The monitoring console must be fully operational including horn, lights and printer (if it has one). Explain any problems in the Comments section.

**Item 4: Sensors are properly placed?** Sensors must be properly placed.

For piping transition sump sensors and dispenser sump sensors, the sensor must be installed according to the manufacturer's requirements and as close to the bottom of the sump as possible.

**Item 5: Sensors are functioning properly?** All sensors must be individually tested for proper operation. Follow the manufacturer's instructions.

Piping transition and dispenser sump sensors usually must be removed from the sump to test. Non-discriminating float sensors can be turned upside down or can be immersed in water to test. Non-discriminating sensors should be immersed in water to test. You may need to expose a discriminating sensor to product in order to verify the sensor can properly discriminate between water and product.

Abuse of a sensor to create an alarm is not allowed.

Pressing the test button on the console is not sufficient to confirm proper operation of the sensor.

The system must alarm when the sensor is triggered.

**Item 6: All sumps in liquid tight condition?** Check to see if the sump is liquid tight. A tightness test is not required. However, if the sump has an obvious hole or crack, penetration boots are not properly in place, significant water is present, or the sump cover is damaged, the facility can not PASS until the condition is corrected. Additionally, be sure that test boot(s) are properly positioned to allow double wall piping to function correctly.

**Item 7: No oil in sumps?** Check the sumps for oil.

If you find oil in any sump, it is evidence of a possible leak and it must be reported to the Department within 24 hours.

If you report the presence of oil, remove the oil and repair the leak before leaving the site, then a passing result can be recorded. You may repair submersible pumps only if you are certified by the pump manufacturer to work on their systems.

**Item 8: No water in sumps?** Check the sumps for water.

If you find water in any sump, it is evidence of a possible leak and it must be reported to the Department within 24 hours.

If you report the presence of water, remove the water and repair the leak before leaving the site, a passing result can be recorded.

## Automatic Line Leak Detectors (LLD)

Line leak detectors (LLD'S) are used to continuously monitor pressurized piping systems for catastrophic leaks.

Any product piping system supplied by a submersible or turbine pump must have a line leak detector that signals the pump to either shut down or switch to slow flow if a leak is detected in the piping system.

**Item 9: LLD Make and Model?** Enter the make and model number of the Line Leak Detector in the space at the top of the section.

**Item 10: Mechanical (M) or Electronic (E) LLD?** Indicate whether the LLD system is mechanical (M) or electronic (E). If one or more of the tanks is not required to have an LLD, enter not applicable (N/A) for those tanks.

**Item 11: LLD listed for use with type of piping present?** Make sure the LLD is listed for use with the type of piping installed (flexible or rigid).

### For Mechanical LLD's

**Item 12: Slow flow when 3 gph leak @ 10 psi is simulated?** Follow the manufacturer's instructions for simulating a three (3) gph @ 10 psi leak in the piping system.

LLD's that fail to detect and respond properly to a three (3) gph leak must be replaced or repaired before the inspection is completed. Note in the Comments block if you replace the LLD.

### For Electronic LLD's

**Item 13: One 0.1 gph or 0.2 gph test passed within last 30 days?** Make sure the settings are correct including pipe type (rigid or flexible), pipe length and leak rate (0.1 gph or 0.2 gph).

Check the test history to confirm the most recent test was passing and was done within the last thirty (30) days.

**Item 14: System alarms and/or shuts off turbine when a 3 gph leak @ 10 psi is simulated?** Make sure the system shuts down the turbine or sounds an alarm when a leak is simulated. For test methods and equipment for electronic LLD's, see the manufacturer's instructions for specific test requirements.

LLD's that fail to detect and respond properly to a three (3) gph leak must be replaced or repaired within 30 days. Note in the Comments block if you replace the LLD.

## Anti-Siphon Valves

In most cases, the product dispenser and some portion of the product piping of a motor fuel aboveground tank are at a lower elevation than the liquid in the tank. In such cases, a hole or defect in the piping can leak product even when the pump is turned off because the piping creates a siphon. To prevent piping from leaking when the pump is off, an anti-siphon valve must be installed. If the bottom of the dispenser and all of the product piping are higher than the top of the tank, skip this section.

A normally closed solenoid valve wired so it opens only when the pump is on is frequently used as an anti-siphon valve. Solenoid valves may be used on both suction and pressure pumping systems. Suction pumps may also use a mechanical anti-siphon valve that uses a spring to keep a valve closed unless the suction pump is operating.

### **Item 15: Mechanical (M), Electric (E) Anti-siphon?**

Indicate whether the anti-siphon is mechanical (M) or electric (E). If there is a piping run that is never at a lower elevation than the highest possible liquid level in the tank (for example, the tank is in a below-grade vault), then an anti-siphon valve is not required and you should leave the box blank and skip to item #18 below.

### **Item 16: Anti-Siphon Valve Properly Located?**

The anti-siphon valve should be installed at the highest point of the piping run. When a LLD is present, the anti-siphon valve should be upstream (on the tank side) of the LLD. If an anti-siphon valve is properly located, mark this item as "Pass." If an anti-siphon valve has not been installed or is not properly located, mark this item as "Fail."

### **Item 17: Electric Anti-Siphon Valve Operational?**

Test the anti-siphon valve for proper operation in accordance with the manufacturer's instructions. If the manufacturer does not provide a testing procedure then one of the two following methods may be used to test an electric anti-siphon valve:

- Disconnect the power wire to the solenoid valve and attempt to dispense fuel from the nozzle. There should be no product flow at the nozzle. Only qualified electricians should conduct this test. Be sure to follow appropriate lockout/tagout procedures when disconnecting and reconnecting the power wire. Properly insulate the ends of the disconnected wires. Insert the nozzle in an appropriate fuel container when attempting to dispense fuel. This is only a general description of the test procedure and not a step-by-step guide. Take all appropriate safety precautions when conducting this test.
- When testing line leak detectors, a "bleedback" or piping "resiliency" step is performed to determine whether there is too much air in the piping. This step also checks the operation of the anti-siphon valve because if the valve is not working, product will not stop flowing when the bleedback test is conducted. Therefore, a passing bleedback test is also a passing

operational test for the anti-siphon valve. This is only a general description of the test procedure and not a step-by-step guide. Take all appropriate safety precautions when conducting this test.

If the electric anti-siphon valve passes one of these tests, mark this item as “P” for “Pass.” If the electric anti-siphon valve fails one of these tests, mark this item as “F” for “Fail.”

There is no practical way that the DEP is aware of to test a mechanical anti-siphon valve. If you have a way to test mechanical anti-siphon valves, please contact the DEP. If a mechanical anti-siphon valve is present, leave this item blank.

### **Dispenser and Crash Valves Area**

There is space for six (6) different dispensers. If there are more than six (6) dispensers, please use additional “Dispenser and Crash Valve Area” forms.

At each dispenser answer the following questions:

**Item 18: No weeps and/or leaks in dispenser?** Check for weeps or leaks at each dispenser. An active weep or leak must be corrected to PASS. This line applies to suction dispensers as well.

Dispenser weeps or leaks are evidence of a possible leak and must be reported to the Department within 24 hours.

A crash valve must be installed on pressurized pipelines serving product dispensers.

**Item 19: Crash valves at correct height?** Make sure the crash valve is installed at the proper height. The shear valve groove must be level with or a maximum of one half inch ( $\frac{1}{2}$ ”) above or below the top of the dispenser island.

**Item 20: Crash valves secured?** Make sure the valve is rigidly secured to the island form.

**Item 21: Crash valves operational?** Open and close the valve several times by hand to ensure that no gum-deposits or other conditions impair operation of the valve. (Caution: Shut off the pumping system before performing this test. Do not open the valve while piping is under pressure.)

### **Stage I Vapor Recovery**

Stage I vapor recovery systems are required for gasoline tanks at facilities where the monthly gasoline throughput has ever exceeded 10,000 gallons. Only a few facilities, such as small convenience stores, seasonal businesses and small trucking companies, do not meet the 10,000 gallon threshold.

**Item 22: Gas throughput for last calendar year?** Fill in the facility’s gasoline throughput for the last calendar year and fill in the year.

**Item 23: Two-point, Manifold or N/A?** Indicate the type of Stage I Vapor Recovery system that is in place – Two Point (2), Manifold (M), or N/A.

### **For Two Point/Manifold Systems**

**Item 24: Vapor recovery poppet cap and gasket in good condition?** Make sure the vapor recovery poppet cap and cap gasket are in place and seal tightly.

**Item 25: Poppet valve moves easily and closes tight?** Check the vapor recovery poppet by depressing the spring loaded center. The poppet should return to its normal position making a tight seal with the poppet housing.

Missing or damaged poppets or gaskets are not acceptable.

**Item 26: Access lid in good condition?** Make sure the access lid over the vapor recovery pipe is in good condition. Chipped, cracked or missing covers must be replaced.

**Item 27: Fill cap and gasket in good condition?** Make sure the fill cap and gasket are present and seal tightly.

**Item 28: Drop tube?** Make sure there is a drop tube in place.

**Item 29: Ends within 6 inches of tank bottom?** Make sure the long side of the drop tube ends within 6 inches of the bottom of the tank.

## **Corrosion Protection (Galvanic and Impressed Current systems)**

Cathodically protected piping systems must be checked every year to ensure they are adequately protected from corrosion.

These checks must be performed by a Maine certified underground tank installer or a Maine certified underground storage tank inspector that has also been certified by Board of Underground Storage Tank Installers as a cathodic protection tester.

There are two systems of cathodic protection – galvanic and impressed current. The inspection requirements are different for the two systems. Galvanic systems are the most common type, representing over 99% of the cathodic protection systems.

### **Galvanic Systems**

Follow the instructions in the Rules for Underground Oil Storage Facilities, Chapter 691, Appendix A and perform a structure to soil potential reading for each piping run that is cathodically protected.

The electrode must be in direct contact with clean soil. The readings must be taken over the center line of each piping run. Wet soil provides better readings. Readings cannot be accurately taken in frozen ground.



**Item 30: Product Pipe** Record the lowest reading taken over the center of each piping run.

Readings less than  $-0.85V$  are failing.

The person taking the readings must sign the Cathodic Protection section certifying that they performed the inspection for this section in accordance with nationally accepted standards and also certify that they are a properly certified Maine underground oil storage tank installer or a properly certified Maine underground oil storage tank inspector that has also been certified by the Board of Underground Storage Tank Installers as a cathodic protection tester.

### Impressed Current Systems

**Item 31: Rectifier has power and is turned on?** Verify that the rectifier has power and is turned on.

**Item 32: Monthly log present and filled out properly?** Verify that the facility is performing monthly inspections of the rectifier that involve reading and recording voltage and/or amperage readings. A written log of these inspections must be maintained. Rectifier voltage and/or amperage outputs are compared to the recommended operating levels that were determined during system installation.

Follow the test methods and criteria as described in the National Association of Corrosion Engineers (NACE) TM 0101-2001, "Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Tank Systems," or TM 0497-2002, "Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems."

### Temporarily Out of Service Tanks

If product is not being added to or removed from an aboveground tank, then the system must be properly removed from service in accordance with the federal spill prevention control and countermeasure (SPCC) Rules and the Department's Rules pertaining to underground piping.

If the piping is cathodically protected, it must be checked yearly to make sure it is still protected from corrosion.

Underground piping must be tested as directed by the Department before it can be placed back into service.

**Note:** For additional conditions regarding out of service ASTs, see 40 CFR 112.2 and the Department's Rules for Underground Oil Storage Tank Facilities, Chapter 691.

**Item 33: Date taken out-of-service?** Enter the date the tank system was taken out of service. If you are not sure of the exact date, explain in the comments section.

**Item 34: Less than 1” product, water, and/or residual OR Electronic Monitoring?** Does the tank have less than one inch (1”) of product, water, or residual?

**Item 35: Vent lines open and functioning properly?** Make sure the tank is properly vented. An open vent is required for safety reasons and to prevent damage to the tank.

**Item 36: Fill pipe locked?** Make sure the fill cap is locked. A locked fill prevents delivery errors and dumping of hazardous waste.

**Item 37: Product piping capped? Pumps and manways secured?** Make sure the product piping has been disconnected and capped and the dispensers and manways are secure. (**Note:** Product piping for seasonal tanks does not have to be disconnected and capped). Dispenser covers, manway covers and lids must be in place.

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After completing the appropriate section of the Inspection Report, fill out the Inspection Summary Report (Page 1). Sign and date the Summary form at the bottom.