

TANK CARE

A Guide to the Operation and Maintenance of Your Underground Storage Tank System

State of New Jersey
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December 2001

MAIL REQUESTS FOR COPIES TO:
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UST Brochure Request - Tank Care: A Guide to Operation and
Maintenance of Your Underground Storage Tank System
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Dear Citizen:

I am pleased to present to you New Jersey's booklet on proper operation and maintenance of underground storage tank systems entitled "Tank Care".

This booklet is written for the tank owner and operator who has installed or upgraded a tank system in compliance with the law. It describes the requirements for proper operation and maintenance of your underground storage tank systems and the record keeping requirements as well. It also contains worksheets and checklists to assist you in performing these tasks.

These requirements apply only to those underground storage tank systems that are regulated by state law. If you are not sure if your tank is regulated, please refer to the table on page 20, or call 609/777-0899 for more information.

Over the next few years, the Department has established a goal to inspect all underground storage tank sites in New Jersey to insure **total compliance**.

Department records indicate that over \$600 million has been spent on underground storage tank cleanups through June 2000. Together, let's leave the legacy of underground storage tank discharges from substandard and unmonitored underground storage tanks behind. Protect your business, financial commitments and the environment with sound underground storage tank management.

Now that you have invested in the proper equipment, its time to insure their safe operation and to maximize the operational life of your underground storage tank system(s). I hope you find this booklet a useful tool for performing proper operation and maintenance of your facility.

Sincerely,

Susan B. Boyle, Assistant Commissioner
Site Remediation Program

Contents

A - Why read this booklet?	1
B - Why worry about your UST system?	1
C - Upgrade requirements	2
D - Leak detection requirements	5
E - Other requirements	13
Tank system repairs	13
Materials disposal practices	14
Tank warranties	15
Fill port markings	15
Financial responsibility requirements	15
O&M Checklist	16
Appendices:	
Operation & Maintenance Checklist	18
Release Response Plan	19
Impressed Current Cathodic Protection Systems Checklist	20
Spill Bucket Hydrostatic Test Checklist	21
Applicability Chart	22
Release Detection Monitoring Record Summary	23
Color Marking Symbols for Fill Ports	24

A. WHY READ THIS BOOKLET?

This booklet is for the underground storage tank (UST)* owner and operator who has installed or upgraded his/her tank systems in compliance with the law. You may think you were done with UST requirements, since the upgrade deadline has passed. However, as you will see, there are still actions that you need to take to ensure your UST systems are operating properly in order to protect your investment. The law and regulations contain specific requirements for proper operation and maintenance of your USTs, as well as record keeping requirements. These requirements are designed to maximize the operational life of your UST systems and insure their safe operation. More importantly, the time and resources spent on these activities will protect your considerable investment and provide you with peace of mind.

B. WHY WORRY ABOUT YOUR UST SYSTEM?

Until the mid 1980's, most USTs were made of bare steel, which were likely to corrode over time and allow UST contents to leak into the environment. Faulty installation or inadequate operating and maintenance procedures can also cause USTs to release their contents into the environment. Piping leaks are even more common than tank leaks – most of these leaks occur at the joints, which are put under stress during normal operating circumstances. Many releases at UST sites occur not due to leaky tanks or piping, but as a result of improper tank filling practices. Minor spillage during deliveries may not seem important, but over time may cause significant impact on the environment. When a tank is overfilled, large volumes can be released through loose fittings on top of the tank or through the vent pipe.

Releases from USTs – from spills, overfills, or leaking tanks and piping – can cause fires or explosions that threaten human safety. Releases from USTs can also seep into the soil and contaminate groundwater with petroleum or other hazardous substances. Nearly half of New Jersey's residents use ground water as their source of drinking water. More than 10,000 releases from regulated underground storage tanks in New Jersey have been documented over the last decade. About 25% of those releases have contaminated ground water.

The average cleanup cost for just one leaking UST is about \$50,000. When releases have resulted in vapors in basements or underground utilities, or have contaminated potable wells, the cleanup costs quickly escalate into the hundreds of thousands of dollars. A long term ground water cleanup where potable water supplies have been affected can cost several **million** dollars over time. Properly installed and operated release detection equipment, however, would alert the tank owner or operator to a discharge early on, allowing a quick cleanup response which would minimize both damage and costs.

Since DEP has begun registering regulated tanks, more than 60,000 substandard tanks have been permanently closed. There are presently more than 25,000 regulated tanks in use in New Jersey. When properly constructed, installed and managed, these USTs will not threaten human health or environment. State and federal laws and regulations require all regulated USTs to have corrosion protection, spill and overfill prevention, and release detection. Existing USTs without this equipment were required to be either upgraded or closed by December 22, 1998.

*Not all tanks are regulated under state or federal law. An underground storage tank system is any tank or combination of tanks, including piping, the volume of which is ten per cent or more beneath the ground. If you are unsure which of your tanks are regulated, please refer to page 21 of the Appendix for an applicability chart.

For further information on the release detection and upgrade requirements, please refer to the Department's documents *Straight Talk on Tanks* (release detection) and *Don't Wait Until 1998* (upgrade requirements). If you need a copy, one can be obtained at the Department's Web Site (www.state.nj.us/dep/srp/bust) or by calling 609/292-8761.

C. UPGRADE REQUIREMENTS

1. Spill and overflow protection

Human errors cause most spills. Both spills and overfills can be avoided by following standard tank filling practices. For example, the tank contents must be measured using a simple gauge stick or an in-tank monitoring device prior to delivery to ensure that there is enough room in the tank for the delivery. You must witness the delivery or otherwise ensure proper practices are followed. Finally, all tanks (except those that are filled by transfers of no more than 25 gallons of product at one time, such as certain waste oil tanks) are required to have proper spill catchment basins (spill buckets to catch drips when the supply hose is disconnected) and overflow protection (automatic shutoff devices, overflow alarms or ball float valves to stop deliveries or alert the operator when the tank is filled to near capacity).

Delivery personnel should know which type of overflow device is present on each tank at your facility and what action will occur (such as a visual or audible alarm or that the product flow into the tank will stop or significantly slow down) if the overflow device is triggered. This can be accomplished by placing a sign or placard near your fill pipes, in plain view of the delivery driver.

In order to insure proper operation of your spill and overflow protection devices, the following practices must be followed.

a. Clean spill catchment basins

Keep spill catchment basins clean of product, water and debris. Only one gallon of fuel leaking each week from a poorly maintained spill catchment basin can result in up to 195 tons of contaminated soil in a year. Manufacturers equip catchment basins with either pumps or drains to remove liquid. Check catchment basins after every delivery and drain as needed. Also check after every rain event; if rain water has collected, do not drain back into the tank, but collect and dispose of the liquid properly. If the liquid or debris contains gasoline or chemicals, it could be considered a hazardous waste if it exhibits a hazardous waste characteristic, such as ignitability. Typically, however, the liquid or debris is a non-hazardous waste, which may be recycled or disposed of properly. Do not, under any circumstance, pump contaminated water into storm or sewer drains as a method of disposal. Improper disposal can result in surface water impacts, vapor/explosion hazards, damage to sewage treatment plants, and criminal prosecution. Collect the liquid or debris in a drum or other container designed to accept such materials. Your certified contractor will then be able to arrange for pick-up and disposal of the liquid or debris you have collected. Be sure to get the name of the final disposal/recycling facility in writing, and check to insure that the facility has the proper approvals for accepting your material. Contact your



certified contractor or an appropriate recycling or waste disposal facility for more information, or call the Department's Hazardous Waste Technical Assistance unit at 609/292-8341 for proper classification and disposal information.

If the spill catchment basin has a drain, check to insure it closes tightly. If the drain is left open it will act as a vent, possibly affecting the ability of the overfill device (if it's a ball float valve) to function properly.

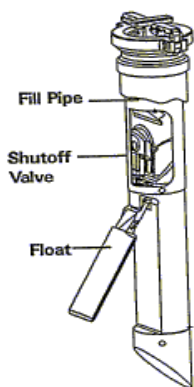
It is a good idea to test your spill catchment basins periodically (once a year is a good schedule) to insure that they are tight and not leaking (a leaking basin will do nothing to prevent spillages as designed). The Appendix contains a checklist for conducting a hydrostatic test on spill catchment basins.

b. Ensure sufficient tank capacity

When measuring the tank contents to ensure sufficient room for the delivery, keep in mind that the actual tank capacity maybe much less than that rated by the manufacturer. In fact, some tanks that have a nominal 10,000 gallon capacity may actually only be able to hold about 9,700 gallons. Also, that capacity will be further reduced by the overfill protection system, which will alarm at 90 per cent capacity or one minute before the tank is filled to capacity, restrict flow at 90 per cent capacity or 30 minutes prior to overfilling or cut off flow at about 95 per cent capacity.

c. Pumped delivery compatibility

If your supplier provides "pumped delivery", where fuel is delivered under pressure, you must make sure your overfill protection device works compatibly with pumped deliveries. Manufacturers do not recommend using ball float valves with pumped deliveries. (These devices are fitted at the bottom of the vent line and create enough back pressure to restrict flow into the tank when the tank nears capacity). Many automatic shutoff devices are also not compatible. (These devices are installed in the fill pipe and can slow down and then stop delivery as the tank nears capacity.) A high level alarm, placed where the delivery driver can hear it, may be the appropriate overfill device to use with pumped deliveries.



d. Automatic shutoff devices

If you have an automatic shutoff device, be aware that once the valve closes, no more liquid can be delivered into the tank, leaving the driver with a hose full of product which may be spilled when the supply hose is disconnected. Some automatic shutoff devices work in two stages. The first stage drastically reduces flow, to alert the driver that the tank is nearly full. The driver can then close the delivery valve and still have room in the tank for the product in the delivery hose (typically about 14 gallons). Your automatic shutoff device should be checked periodically by a certified contractor to make sure it is functioning properly.

e. Overfill alarms

These are often part of tank gauging system. If you have overfill alarms, be sure that the alarms are located where the driver can hear or see them easily. Check to ensure that the alarms are put on separate circuit that is always active. Many deliveries are made at night when the facility is closed; therefore, you don't want to turn off your alarm when you turn off the office lights. Your overfill alarm should be checked periodically by a certified contractor to make sure it is functioning properly.

f. Ball float valves

Ball float valves are placed near the bottom of the vent line and rise with the product level during delivery, restricting vapor flowing out of the vent line. This can create enough back pressure to slow down product flow into the tank, and alert the driver to close the delivery truck's shutoff valve. However, if the UST has loose fittings where piping is attached at the bungs on top of the tank, sufficient back pressure may not develop and will result in an overfill. Therefore, check to ensure that your tanks have tight fittings so the ball float valve will work. Also, as noted in section 1 a. above, ensure that your spill catchment basin drain is closed tightly. In addition, note that ball float valves are not designed to work if you have suction piping, pressurized delivery or coaxial Stage I vapor recovery. Your ball float valve should be checked periodically by a certified contractor to make sure it is functioning properly.



2. Corrosion protection

Corrosion protection for your tank and piping can be provided by several different methods. The tank and piping can be completely made of noncorrodible material, such as fiberglass. The tank may be made of steel clad with a thick layer of noncorrodible material, such as fiberglass. The tank and piping may be completely isolated from contact with the surrounding soil by being enclosed (jacketed) in noncorrodible material, such as high density polyethylene (HDPE).

Cathodic protection, in the form of sacrificial anodes (typically installed at the factory) or impressed current (added to existing tanks and piping) is another method. You can also add interior lining to your tank, where the tank is lined with a thick layer of noncorrodible material, such as fiberglass. Finally, cathodic protection may be combined with interior lining. If your tank and piping has cathodic protection (sacrificial anodes or impressed current) or interior lining, there are certain testing and inspection requirements that must be conducted to insure that your tanks and piping continue to be protected from corrosion over time.



a. Sacrificial anode cathodic protection

Your sacrificial anodes must be tested by a certified cathodic protection tester within six months of installation, and every three years thereafter. Remember to keep all results of your tests to prove that your system is operating properly.

b. Impressed current cathodic protection

Your impressed current system must be tested by a certified cathodic protection tester within six months of installation, and every three years thereafter. In addition, you must inspect your system every 60 days to ensure that the system is operating. Remember to keep all results of your inspections and tests to prove that your impressed current system is operating properly. The



Appendix contains a form for your use in recording the results of your 60 day inspections.

c. Interior lining

This option is for tanks only. Tanks using only an interior lining for corrosion protection must pass an internal reinspection 10 years after installation and every 5 years after that to make sure that the lining is sound. This inspection must be conducted by a contractor certified by the Department. Remember to keep records of the inspection results.

d. Combined cathodic protection & interior lining

While no interior inspection is required for this combined method of corrosion protection, you will still need to have the cathodic protection system tested as listed above in item a or b.

D. LEAK DETECTION REQUIREMENTS

1. General requirements

There is no one leak detection method that is best for all sites, nor is there a particular type of leak detection that is consistently the least expensive. Each method has its unique characteristics, and its strengths and limitations.

For most methods, monthly monitoring is required. If a method requires an alternate schedule, it is indicated in the discussion of that method below. Remember that any person installing or repairing leak detection equipment must be certified by the Department.

a. Reporting requirements

Remember to keep accurate, up-to-date records of your leak detection procedures. Keep all records at your facility so they will be available for inspection at any time by any authorized local, county, state or federal inspector. The Appendix contains a monthly release detection monitoring record summary for your use. Feel free to make copies and use this form as needed. You may not discard any records without prior written approval from the Department. Your records should include the following:

- the frequency of monitoring
- leak detection method used
- monitoring location(s)
- name/titles of the person(s) performing the monitoring and maintaining the systems
- training for the above persons
- manufacturers' written performance claims
- calibration, maintenance or repair of leak detection equipment
- monthly summary of leak detection results
- maintenance checks of leak detection equipment

Many station operators and owners organize this information in a single file or binder. This helps keep records in order and minimizes disruptions during inspections.

JUN 12, 2001 5:00 AM	
INVENTORY REPORT	
T 1: UNLEADED REGULAR	
VOLUME	= 8868 GALS
ULLAGE	= 3054 GALS
90% ULLAGE	= 1861 GALS
TC VOLUME	= 8766 GALS
HEIGHT	= 83.26 INCHES
WATER VOL	= 0 GALS
WATER	= 0.00 INCHES
TEMP	= 76.9 DEG F
T 2: UNLEADED PREMIUM	
VOLUME	= 2671 GALS
ULLAGE	= 5365 GALS
90% ULLAGE	= 4561 GALS
TC VOLUME	= 2647 GALS
HEIGHT	= 43.82 INCHES
WATER VOL	= 0 GALS
WATER	= 0.00 INCHES
TEMP	= 72.7 DEG F
T 3: DIESEL	
VOLUME	= 2696 GALS
ULLAGE	= 7502 GALS
90% ULLAGE	= 6482 GALS
TC VOLUME	= 2685 GALS
HEIGHT	= 37.13 INCHES
WATER VOL	= 0 GALS
WATER	= 0.00 INCHES
TEMP	= 69.2 DEG F
***** END *****	

b. Temporary and permanent methods

Some of the leak detection methods are temporary, and therefore must eventually be replaced with a more permanent method (the permanent methods are sometimes referred to as monthly monitoring). Acceptable temporary and monthly methods are specified in Sections D2 -D8 below.

c. "False" alarms

If the audible or visual alarm of your leak detection system is in alert, don't just assume that there is a malfunction causing a false alarm, or that your "new system can't be leaking". Rather, call your manufacturer's representative to check whether your system is operating properly. In no event should you just turn off or disconnect your alarm. An alarm is an indication of a suspected release, which must be investigated to confirm (or disprove) that your tank or piping is leaking (see next item).

d. Suspected releases

State and federal regulations require that you investigate any suspected releases. A release may be suspected for many reasons, including (but not limited to) the following:

- Inventory control records (see item 2.c. below) indicate a release may have occurred in excess of one per cent of the tank's monthly flow-through plus 130 gallons
- Manual tank gauging inventory control records indicate that a release may have occurred
- There is evidence of a hazardous substance or resulting vapor in the soil, in surface water, or in any underground structure or well near your facility
- There is water in your tank that is not due to condensation or deliveries
- Your pump dispensers are not working properly (for example, there is a loss of, or decrease in, line pressure)
- There is a sudden loss of product from your tank or piping
- A precision (tightness) test of your tank or piping indicates that a release may have occurred
- Your leak detection equipment goes into alarm

A suspected release must be investigated and confirmed or disproved within *seven days* of discovering the suspected release. The investigation must include all of the following procedures which apply:

- Check inventory control records for mathematical accuracy.
- Visually inspect all manholes, sumps, and any other readily accessible facilities for evidence of a leak or discharge.
- Check the calibration of your dispenser meters, and if necessary, have your meters calibrated
- Check for a malfunction of your leak detection system. Call your manufacturer's representative to help perform this check.
- If the release is suspected due to a precision (tightness) test, another precision test should be conducted only if either: 1) the results of that test were inconclusive due to the failure of the test to take into account and compensate for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, or the location of the water table, or 2) there were loose fittings in a non-product bearing part of the tank.
- If none of the above investigations can conclusively confirm or disprove a suspected release, then a site investigation must be conducted. This will involve collecting soil and/or ground water samples from the area of the tank or piping in question. This site investigation must be conducted by a subsurface evaluator certified by the Department.

Suspected releases must be taken seriously. Stopping a release early on may mean the difference between a major tank field excavation vs. minor excavation or tank system repair.

e. Reporting confirmed releases

If you confirm a release you must immediately call the appropriate local health agency and the Department's Environmental Action Hot Line toll free at **877/WARN DEP (927-6337)**. When notifying the Department, you must provide information on the type and estimated quantity of substance discharged; the location of the discharge; the actions being taken to contain, remediate and/or remove the substance discharged (e.g. emptying the tank, cleaning up surface spills, identifying and stopping any fire, vapor or explosion hazard, etc.); and any other relevant information which the Department may request at the time of notification.

After making your report, you must arrange to clean up the contamination, in accordance with the Technical Requirements for Site Remediation, N.J.A.C. 7:26E. A subsurface evaluator, certified by the Department, is required to oversee all aspects of the cleanup.

f. Release Response Plan

You must also keep a release response plan on site to assist you in determining the appropriate actions to take in the event of a release. The release response plan must include telephone numbers for the local fire and health departments; the Department's Hot Line number listed above; the name and telephone number of the person responsible for the operation of your facility in an emergency; the name and telephone number of any retained corrective action contractor; and the specific cleanup and tank closure procedures to be followed, if necessary, in the event of a leak or discharge (see N.J.A.C 7:14B-8 and 9 for information on cleanup and tank closure requirements). The Appendix contains a Release Response Plan form. Feel free to fill it out and post it in a prominent location at your facility.

g. Cleanup materials and equipment

You *should* have enough absorbent material at your facility to contain a spill of petroleum products until emergency response personnel can respond to the incident. The suggested supplies include, but are not limited to the following:

- Sphagsorb, Speedy Dri, kitty litter, chopped corn cob or similar absorbent material
- Containment booms, dikes, pillows, and other containment devices
- Spark proof shovel
- Storm drain mat
- 55 gallon drums
- Buckets
- Reels of "caution tape"
- Personal protective gear
- Traffic cones
- Warning signs
- Spark-free and safe flashlight

h. Inconclusive leak detection results

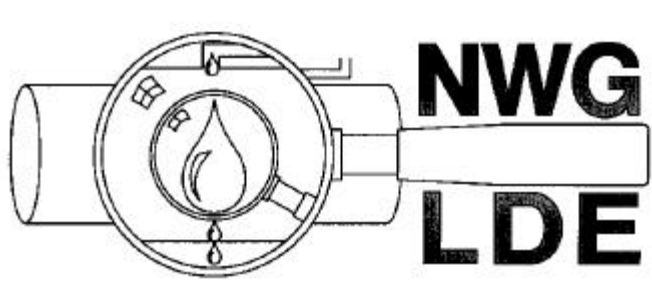
The results of certain leak detection methods may sometimes prove to be inconclusive. Examples are precision tests of tanks and piping and SIR (statistical inventory reconciliation) results. Results can be inconclusive due to variables such as temperature variations which have not or cannot be accounted for. If your leak detection results are inconclusive, then you can't tell if your tank or piping is sound or leaking. Therefore, inconclusive leak detection results do not provide acceptable leak detection for that month. Unless you perform another acceptable, conclusive method for that month, you will be out of compliance with your leak detection requirements. If your leak detection results continue to be inconclusive, it will be necessary to use another method of leak detection for your tank that can provide conclusive results.

i. Alternative technologies

The Department can approve leak detection technologies other than the ones listed below, if they are at least as protective of human health and the environment as the listed methods. If you are using or considering using an alternate method, you should contact the Department's Bureau of Field Operations, Initial Notice Section at 609/633-0708 to determine if that technology is acceptable.

j. List of leak detection evaluations

The United States Environmental Protection Agency (USEPA) provides a list which contains a detailed summary of specifications, based on third party evaluations, for various systems that detect leaks from tanks and piping. This list is compiled by the National Workgroup on Leak Detection Evaluations. Note that most test methods are limited for use based on tank size, product stored and other limitations specified by the manufacturer. Any leak detection method that you choose must have independent, third party certification, and be used in a manner consistent with that certification. (For instance, an automatic tank gauge rated for USTs up to 20,000 gallon capacity should not be used in a 30,000 gallon tank.) This list may be obtained by calling 800/490-9198 or online at www.epa.gov/oust/pubs/index.htm.



2. Tank tightness testing combined with inventory control [temporary method]

This combination method may be used only for 10 years after UST installation or upgrade with corrosion protection, whichever is sooner. After that time, another permanent, monthly method must be used. This method is a combination of tank tightness testing and inventory control (or manual tank gauging for smaller tanks – see item 3 below). When inventory control is used, the tank system must be equipped with a totalizer. Since heating oil tank systems do not have totalizers, they cannot use this method of leak detection.

a. Tightness testing

Tightness testing must be conducted every five years, for up to 10 years after installation or upgrade with corrosion protection and no longer. All tightness testing must be conducted by an individual certified by the Department. Some automatic tank gauging systems are capable of meeting the regulatory requirements for tank tightness testing and can be considered an equivalent method. The tank system typically must be taken out of service for the tightness test, generally for several hours, depending on the method. Variations in temperature and the presence of ground water around the tank must be accounted for in performing the test. The testing device must be properly calibrated by trained personnel, and must be compatible with the product stored. Do not use any tank testing method if your tank is larger than the maximum specified capacity in the third-party evaluation of that method.

b. Inventory control

This method may be conducted by the owner, operator or an employee. The following are regulatory requirements:

- Use the correct calibration chart for your tank. This may be obtained from the tank manufacturer.
- Take stick readings daily and reconcile the numbers on a monthly basis.
- The gauge stick must be marked so the product level can be determined to the nearest 1/8 of an inch.
- The gauge stick should be long enough to reach the bottom of the tank, and must be in good condition.
- Monthly measurements must be taken to identify any water at the bottom of the tank.
- Product dispensers must be calibrated to the local weights and measures standards.

Also consider the following:

- Take meter and stick readings at the same time.
- The accuracy of tank gauging can be greatly increased by spreading product-finding paste on the gauge stick before taking measurements (or by using in-tank product level measuring devices).

The Department's booklet called *Doing Inventory Control Right*, describes in detail how to conduct inventory control, and contains worksheets. You may obtain a copy at the Department's web site (www.state.nj.us/dep/srp/bust) or by calling 609/292-8761.

3. Manual tank gauging

This may be used as a stand-alone method for tanks of 1,000 gallon rated capacity or less. It may also be combined with tightness testing (see above) for tanks with a rated capacity of 1,001 to 2,000 gallons, but for those tanks, manual tank gauging is a temporary method only. Here are some requirements to keep in mind:

- Four measurements of the tank's contents must be taken each week. This can be done by the owner, operator or an employee.
- There are both weekly and monthly standards for a passing test, which differ depending on the tank size. The minimum duration of the test is also tank size dependent.
- As with inventory control, use the correct tank calibration chart, obtained from the tank manufacturer.
- As with inventory control the gauge stick must be capable of obtaining readings to the nearest 1/8 of an inch, and must be in good condition and long enough to reach the bottom of the tank.

The Department's booklet, *Manual Tank Gauging*, lists the weekly and monthly standards for a passing test. It also contains worksheets, and describes the method in detail. You may obtain a copy at the Department's web site (www.state.nj.us/dep/srp/bust) or by calling 609/292-8761.

4. Secondary containment with interstitial monitoring

This is a permanent, monthly method. Readings can be taken manually, or by an automated, electronic device. This method can be used for either the tank or the piping, or both. If your tank has an automated system, it must be properly calibrated by trained personnel, and calibration results must be maintained on-site.

5. Automatic tank gauging (ATG)

This method may be used for tanks only. It is a permanent, monthly method. Unless the ATG is of the “continuous” type, no product should be delivered to or withdrawn from the tank for at least six hours before the monthly test or during the test. The ATG must be compatible with the product stored, and must be properly calibrated by a trained technician, and calibration results must be maintained on-site.



6. Vapor monitoring

This is a permanent, monthly method. Readings can be performed with a hand-held device, or can be automated. This method can be used for tanks and piping. You must insure that high ground water, rain or moisture does not interfere with the operation of your vapor monitoring for more than 30 consecutive days. If you have any spills or leaks at your facility, you must begin using an alternate monitoring method. Your vapor monitoring devices must be properly calibrated by a trained technician, and calibration results must be maintained on-site. Keep your vapor monitoring wells secure and clearly marked.

7. Ground water monitoring

This is a permanent, monthly method. Readings can be manual using a bailer, or by an automated, electronic device. This method can be used for either the tank or the piping, or both. If your tank has an automated system, it must be properly calibrated by trained personnel, and calibration results must be maintained on-site. This method may be used for tanks and piping. Keep your ground water monitoring wells secure and clearly marked.

8. Statistical Inventory Reconciliation (SIR)

This is a permanent, monthly method. Readings can be made using a gauge stick or by an automatic tank gauge. This method tests both the tank and the piping. If your tank has an automated system, it must be properly calibrated by trained personnel. Make sure the SIR method you use is third party approved for piping, and for manifolded tanks (if you use SIR for manifolded tanks). Do not use any SIR method if your tank is more than the rated capacity of the tank on the third-party evaluation of that method. Finally, be aware that water around a tank may “hide” a hole – check for water in your tank monthly.

9. Heating oil USTs

Heating oil tanks provide a unique challenge for leak detection. Most heating oil tanks have separate supply and return lines. As a result, many of the leak detection options, such as SIR, the “combined” method (inventory control and tank tightness testing) and automatic tank gauging won’t allow accurate results. Therefore, heating oil tank systems, or any other tank systems with separate supply and return lines may use any of the methods of leak detection listed above which apply. In addition, these tank systems may also provide leak detection by tightness testing every three years (see tightness testing above for requirements) and by checking for water at each delivery.

10. Leak detection for underground piping

a. Suction piping

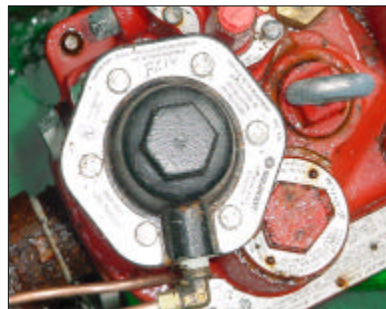
i. If you have “safe” suction piping (the piping is sloped such that the product in the pipe can drain back into the tank when suction is released, and the system has only one check valve, which is located as close as possible beneath the pump in the dispensing unit), then no monitoring is necessary. However, for this method, there must be a way to verify that the line was actually installed properly (sloping back to the tank, with only one check valve located under the dispenser). Verification can be via as-built plans, a test port at the valve or any other method acceptable to the Department. If “safe” suction cannot be verified, the piping is not assumed safe, and another method (items ii or iii below) must be performed.

ii. Another option is to perform a line tightness test every three years (see tightness testing above for requirements).

iii. **Monthly monitoring.** Interstitial monitoring, vapor monitoring, ground water monitoring and statistical inventory reconciliation are all piping leak detection options which have the same regulatory requirements for piping as they do for tanks.

b. Pressurized piping

For pressurized piping, two methods of monitoring are actually required. You must have an automatic line leak detector (LLD) and one of the other methods listed below. An LLD is capable of detecting large leaks (3 gph, as rated by the manufacturer) within a short time frame (one hour). An LLD can be an automatic flow restrictor (typically mechanical and last 3-4 years), an automatic flow shutoff or a continuous alarm (the last two are electronic devices). Whatever type of LLD you have, you are required to have someone certified by the Department perform an annual test of the LLD in accordance with the manufacturer’s specifications.



In addition to an LLD, you must also have one of the following for pressurized piping to be in compliance with leak detection:

i. Monthly monitoring

This includes interstitial monitoring (for secondarily contained piping), vapor or ground water monitoring, or statistical inventory reconciliation (SIR). Interstitial monitoring, vapor or ground water monitoring, and statistical inventory reconciliation have the same regulatory requirements for piping as they do for tanks;

ii. In-line electronic pressure monitor

These devices check for a loss in line pressure while no product is dispensed. This method may be used monthly or every time the dispenser turns off; or

iii. **Annual tightness test** – see tightness testing above for requirements

E. OTHER REQUIREMENTS

1. Tank system repairs

a. Certified contractors

All repairs required by the UST regulations (see N.J.A.C. 7:14B-5.4) must be performed by an individual certified by the Department.

b. Permits

A permit must be obtained from the Department (see N.J.A.C. 7:14B-10) prior to performing the repair, unless the repair involves replacement of a section (not the entire length) of piping, the piping meets the regulatory standards for corrosion protection at N.J.A.C. 7:14B-4.1(a)2, and the installation does not affect the existing cathodic protection system. Permits are not required for the following:

- installation of vapor control systems;
- changing of the tank contents (the new product must be compatible with the tank's construction material or tank lining);
- installation of a line release detector;
- performance of a "minor" repair which does not involve cutting the tank shell, does not affect any cathodic protection systems, or does not otherwise affect the storage capacity, physical configuration, or physical integrity of the tank system or of its monitoring system; and
- performance of some other operation which will not affect storage capacity, physical configuration, or physical integrity of the tank system or its monitoring system.

However, whether or not a permit is required from the Department, local construction permits may be required. Contact the local construction code official for further information.

Your contractor must perform repairs in accordance with accepted industry practices. Repairs must prevent releases due to structural failure or corrosion as long as the UST system is used to store hazardous substances. Metal pipe sections and fittings that have released product due to corrosion or other damage must be replaced. Fiberglass pipe sections and fittings must be repaired or replaced per the manufacturer's specifications.

c. Testing

Within 30 calendar days following completion of any repair, tanks and piping must be tightness tested. Tightness testing is not required when the repaired tank is internally inspected in a proper manner, or when the repaired section of the tank system is monitored monthly in accordance with one of the acceptable methods listed in Section D above. Any cathodically protected UST system must be tested by a Department certified cathodic protection tester or specialist within six months of any repair.

d. Records

You must maintain records of each repair and associated test for the operational life of your UST system. These records cannot be discarded, even after closure of the UST system unless written approval has been obtained from the Department.

2. Materials disposal practices

a. Emptying spill catchment basins

See Section C.1.a.

b. Removing water from tanks

Remember that water in your tank that is not due to condensation or deliveries is considered to be a suspected release. (Refer to section D.1.d. for more information on suspected releases.) Water in your steel tank can cause internal corrosion; water in any tank will cause problems if pumped out with product (e.g., drivers will not be happy with their car's performance using water as a fuel).

Water in the tank will contain a relatively small amount of dissolved product. This water/product mixture will be a hazardous waste if it exhibits a hazardous waste characteristic, such as ignitability. Typically, the water/product mixture in a petroleum tank is a non-hazardous waste, which may be recycled or disposed of properly. Your certified contractor will then be able to arrange for pump-out and disposal of the water/product mixture in your tank. Be sure to get the name of the final disposal/recycling facility in writing, and check to ensure that the facility has the proper approvals for accepting your material. Contact your certified contractor or appropriate recycling or waste disposal facility for more information, or call the Department's Hazardous Waste Technical Assistance unit at 609/292-8341.

c. Spill cleanup residue

If you should have a minor spill, such as a small overflow of a car's gasoline tank, promptly use your cleanup materials (absorbent materials, containment devices, spark-proof shovels, etc.) to absorb and pick up the liquids and place the materials in appropriate receptacles. (See Section D.1.g. for more information on cleanup materials and equipment.)

If the absorbent material contains gasoline or chemicals, it could be considered a hazardous waste if it exhibits a hazardous waste characteristic, such as ignitability. Typically, however, for petroleum products tanks the materials you collected would be a non-hazardous waste, which may be recycled or disposed of properly. Your certified contractor will be able to arrange for pick-up and disposal of the materials you have collected. Be sure to get the name of the final disposal/recycling facility in writing, and check to ensure that the facility has the proper approvals for accepting your material. Contact your certified contractor or an appropriate recycling or waste disposal facility for more information, or call the Department's Hazardous Waste Technical Assistance unit at 609/292-8341.

d. Proper disposal of waste/residue

Do not, under any circumstance, pump contaminated water into storm or sewer drains as a method of disposal. Improper disposal can result in surface water impacts, vapor/explosion hazards, damage to sewage treatment plants, and criminal prosecution. Collect the liquid or debris in a drum or other container designed to accept such materials. Your certified contractor will then be able to arrange for pick-up and disposal of the liquid or debris you have collected.

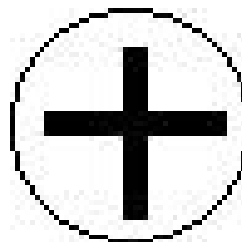
Be sure to get the name of the final disposal/recycling facility in writing, and check to insure that the facility has the proper approvals for accepting your material. Contact your certified contractor or an appropriate recycling or waste disposal facility for more information, or call the Department's Hazardous Waste Technical Assistance unit at 609/292-8341 for proper classification and disposal information.

3. Tank warranties

Many new tanks have warranties provided by the tank manufacturer, typically, for thirty years. Conditions of these warranties will include proper installation and operation. Check with your installer or tank manufacturer for the specific conditions of your warranty. Implied by the specified time limit of your warranty is the fact that your tank is not expected to last forever. You may need to replace your tank at the end of its operational life. Piping, since it is field constructed, does not receive a similar manufacturer's warranty.

4. Fill port markings

All fill ports must be permanently marked to identify the product inside the tank system. This prevents your supplier from accidentally filling your tank with the wrong product, or pumping product into ground water monitoring wells. The markings need to follow the color and symbol codes established by the American Petroleum Institute Publication #1637, *Using the API Color-Symbol System to Mark Equipment and Vehicles for Product Identification at Service Station and Distribution Terminals*. For your convenience, the Appendix has a chart showing these symbols and colors.



5. Financial responsibility requirements

a. What are financial responsibility requirements, and why have them?

Despite your best efforts to install, upgrade and maintain your UST system in compliance with all the regulatory requirements, you may still suffer a discharge from your UST system. Cleaning up a discharge can be costly. As a result, federal regulations require UST owners and operators to demonstrate that they have the financial resources – through insurance or other means explained below – to pay for the costs of cleanups and third party damages that can result from leaking UST systems.

The financial responsibility requirements are designed to make sure that someone can pay the costs of cleaning up discharges and compensating third-parties for bodily injuries and property damage caused by discharges from UST systems. Either the owner or the operator of the UST system must demonstrate financial responsibility.

b. How can you demonstrate financial responsibility?

- **Obtain insurance coverage.** Insurance may be available from a private insurer or a risk retention group.
- **Obtain a guarantee.** You may secure a guarantee for the coverage amount from another firm with whom you have a relationship. The provider of the guarantee has to pass certain financial tests.
- **Obtain a letter of credit.** A letter of credit is a contract involving you, an insurer (usually a bank), and a third party (such as the implementing agency) that obligates the issuer to help you demonstrate your financial responsibility.
- **Pass a financial test.** If your firm has a tangible net worth of at least \$10 million, you can prove your financial responsibility by passing certain financial tests.
- **Set up a trust fund.** You may set up a fully-funded trust fund administered by a third party to demonstrate financial responsibility.

Local governments have four additional compliance methods tailored to their special characteristics:

A bond rating, a financial test, a guarantee, and a dedicated fund (all fully described in 40 CFR Part 280).

c. What kind of USTs need to meet these requirements?

Any federally regulated UST system which stores petroleum. New Jersey state-only regulated UST systems as well as non-petroleum hazardous substance UST systems are, at present, exempt from these requirements.

d. How much coverage am I required to have?

- i. **Aggregate coverage:** \$1 million, if you have 100 or fewer tanks
\$2 million, if you have more than 100 tanks
- ii. **Per occurrence coverage:**
 - Petroleum marketers: \$1 million
 - Nonmarketers and local governments:
 - \$500,000 if throughput is 10,000 gallons monthly or less, or
 - \$1 million if throughput is more than 10,000 gallons monthly

e. Where can I obtain coverage?

US EPA has a document titled *List of Known Insurance Providers for USTs*, which can be obtained at EPA's web site (<http://www.epa.gov/swerust1/pubs/index.htm#inslist>) or by calling EPA's RCRA Hotline at 800/424-9346.

F. O&M CHECKLIST

For your convenience, the Appendix contains an operation and maintenance checklist. You may wish to post this checklist in a prominent place to use as an aid in remembering the various O&M activities that must be performed at your facility.

APPENDICES

OPERATION & MAINTENANCE CHECKLIST

Instructions:

1. Post this check list in a conspicuous location as an aid in remembering the O&M activities you must perform (or activities a certified individual must perform).
2. Depending on the specific equipment at your facility, not all activities will apply. Check the "Y/N" column to indicate which activities need to be performed at your facility.
3. The "Performed by" column indicates which activities must be performed by a certified individual. All other activities may be performed by you or your employees.
4. You may also want to mark reminders for various activities on your business calendar.

How often	Activity	Performed by	Y/N	Completed						
Daily	Stick tanks & check for water (for temporary release detection method) ⑤									
Every delivery	Check for water during delivery (heating oil tanks that are tightness tested every three years)									
	Ensure sufficient tank capacity									
Every delivery & rain event	Keep spill bucket free of debris & liquid ①									
Weekly	Manual tank gauging ②									
Monthly	Reconcile inventory ③ (for temporary release detection method) ⑤									
	Perform monthly release detection ④ (tank & piping)									
Every two months	Check impressed current system to ensure it is on and operating properly									
Every year	Test automatic line leak detectors (pressurized piping)	Certified contractor								
	Perform annual line tightness test for pressurized piping (alternative to monthly monitoring)	Certified tester								
Every three years	Perform cathodic protection testing (check anodes)	Certified tester/ specialist								
	Tank tightness testing (alternative to monthly monitoring for tanks with separate supply & return lines, i.e., heating oil tanks)	Certified tester								
	Tightness test non-safe suction lines (option to monthly monitoring)									
Every five years	Inspect internal lining (inspect 10 years after installation & every 5 years thereafter)	Certified contractor								
	Tank tightness testing (for temporary release detection method) ⑤	Certified tester								

① See "Checklist for Conducting a Hydrostatic Test on a Spill Bucket" in Appendices

③ See *Doing Inventory Control Right* for checklist & instructions

⑤ Can be used only for 10 years after tank installation or upgrade with cathodic protection

② See *Manual Tank Gauging* for checklist & instructions

④ See "30 Day Release Detection Monitoring Record Summary" in Appendices

Checklist for Conducting a Hydrostatic Test on a Spill Bucket

You should perform this test at least once a year. The test will take approximately 24 hours to perform. During this time, no deliveries may be made at this fill pipe. You will need water and a tape measure that is capable of measuring to one-sixteenth of an inch. You should conduct the test only during a time when there will be fair weather (i.e. no precipitation) - inclement weather would cause the water in the spill bucket to increase by an unknown amount.

Ensure that the spill bucket is empty and clean.

Make sure that any drain valves are completely closed.

Pour water into the spill bucket until the water covers the top of the seal located between the spill bucket and fill pipe by at least two inches.

Allow the water to stand several minutes before taking the first measurement.

Measure the height of the water using your tape measure to the nearest one-sixteenth of an inch.

About 12 hours into the test, measure the height of the water to the nearest one-sixteenth of an inch using your tape measure again.

Always take the measurement in the same location of the spill bucket

About 24 hours into the test, measure the height of the water to the nearest one-sixteenth of an inch using your tape measure again.

Always take the measurement in the same location of the spill bucket

Initial Reading: _____

12 hour reading: _____

24 hour reading: _____

Empty and clean the spill bucket.

Refer to Section C.1.a of the text for information concerning proper handling and disposal of the spill bucket contents.

If the water level in the spill bucket decreases by as much as one-sixteenth of an inch or more, your spill bucket may be leaking. You need to have the spill bucket evaluated by a professional contractor to determine if it can be repaired or that it must be replaced.

If the water level in the spill bucket loses less than one-sixteenth of an inch, the spill bucket tests tight this time - but retest the spill bucket periodically.

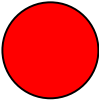





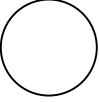


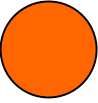

**APPLICABILITY AND SUMMARY OF REGULATED UNDERGROUND STORAGE
TANKS IN NEW JERSEY**

Substance Stored/ Use	Tank Capacity *	Applicable Law(s)	Comments/Explanations
Heating oil for sale, distribution or commercial use	any amount	Federal & state UST laws	Fuel oil dealers, and others who sell, distribute, or use heating oil in a commercial process, must comply.
Heating oil for non-residential heating	more than 2,000 gallons	State UST law	Facilities with aggregate UST capacities of 2,000 gallons or less are exempt from the state UST law. Heating oil tanks of any size used for residential heating are also exempt.
Motor fuels for non-residential use or sale`	any amount	Federal and state UST laws	Includes petroleum products used in the operation of a motor: gasoline, diesel, aviation, gasohol,etc.
Motor fuels for farm or residential use	more than 1,100 gallons	Federal and state UST laws	USTs located at a residence but used for business purposes are required to comply. Owners of farm USTs should contact the DEP at the number below for special applicability information.
Waste oil	any amount	Federal and state UST laws	Waste oil includes used automotive crankcase oil and other used lubricating oils.
Hazardous wastes	any amount	State UST law	Although they are not regulated by the federal UST law, hazardous wastes <u>are</u> regulated by Subtitle C of the Resource Conservation and Recovery Act (42 U.S.C. §6921). For hazardous waste classification and technical assistance, contact the DEP's Hazardous Waste Technical Assistance unit at 609/292-8341.
Other hazardous substances	any amount	Federal and state UST laws	A list of hazardous substances is available from the DEP by calling the number below.

* All gallonage figures are based on the manufacturer's nominal tank capacity only. All gallonage totals are aggregate for the substance stored at the specific site.

For applicability questions call 609/777-0899

Colors and Marking Symbols for Fill Ports Petroleum Substances

GASOLINES		DISTILLATES
Leaded	Unleaded	
		
	High Grade	Diesel
		
	Middle Grade	No. 1 Fuel Oil
		
	Low Grade	No. 2 Fuel Oil
		
	Vapor Recovery	Kerosene

EXAMPLES OF SYMBOLS FOR PRODUCTS WITH EXTENDERS (OPTIONAL)



Unleaded high-grade
Gasoline with extender



Waste Oil



Diesel
with extender

Note: For petroleum products not listed, mark the fill port to identify the substance stored.