



Your Florida Petroleum Storage Tank Facility Inspection Guide





This handbook is provided as a general guide.

For specific regulatory requirements refer to the underground and aboveground storage tank systems rules (Chapters 62-761 and 62-762, Florida Administrative Code) which are located at the district and county offices, and under the “Rules” tab at the Florida Department of Environmental Protection’s (FDEP) Storage Tank Compliance website: <https://floridadep.gov/waste/permitting-compliance-assistance/content/storage-tank-compliance>.



This Compliance Assistance Guide for Petroleum Storage Tank Systems is prepared by the Broward County Environmental Protection and Growth Management Department Pollution Prevention Division Compliance Assistance Section for the Florida Department of Environmental Protection’s Division of Waste Management, Permitting and Compliance Assistance Program, Storage Tank Compliance, to assist owners and operators of storage tank systems with attaining and maintaining operational compliance with applicable rules and regulations.

Inclusion of specific equipment brands within this document is intended for information purposes only and does not constitute endorsement of these products. Certain images and photos herein are used with permission and courtesy of Broward County, the Florida Department of Environmental Protection, Source North America Corporation, Highland Tank & Manufacturing Co., Inc., and the Environmental Protection Agency.

For a list of FDEP approved/registered Storage Tank System equipment, see:

<https://floridadep.gov/waste/permitting-compliance-assistance/content/storage-tank-system-equipment-registration>

Esta publicación está disponible en español en la siguiente página web:

<https://floridadep.gov/waste/permitting-compliance-assistance/content/storage-tank-compliance>

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STORAGE TANK SYSTEMS REQUIREMENTS



Double-walled Fiberglass-coated Steel USTs during installation



Double-walled Fiberglass UST with Brine-filled Interstice



Single-walled Steel AST Inside Concrete Secondary Containment



Double-walled Vertical Steel ASTs

The Florida Department of Environmental Protection (FDEP) regulates the storage and operation of regulated substances that are stored in Underground Storage Tank (UST) systems or Aboveground Storage Tank (AST) systems throughout the State of Florida. USTs with capacities greater than 110 gallons and ASTs with capacities greater than 550 gallons are regulated and required to be registered with the FDEP.

FDEP or its designated county inspectors will visit your site to conduct compliance inspections periodically to verify these systems are operated and maintained according to code. Site access to the facility and individual storage tank systems and their components shall be provided for FDEP compliance and other follow-up inspections. This brochure provides guidance on UST and AST systems and their main components that are required to be maintained and monitored as part of the State regulatory inspection requirements.

Note:

Aboveground mineral acid storage tanks with individual capacities greater than 110 gallons containing hydrobromic acid (HBr), hydrochloric acid (HCL), hydrofluoric acid (HF), phosphoric acid (H_3PO_4) or sulfuric acid (H_2SO_4) are only subject to Rule 62-762.891, Florida Administrative Code (F.A.C.). Aboveground compression vessels and hazardous substance storage tanks with individual capacities greater than 110 gallons are only required to be registered with the FDEP.

UNDERGROUND STORAGE TANK SYSTEMS

Storage tank systems have three primary components: the tank, integral piping and fuel dispensing pump(s). All Underground Storage Tanks (UST) must be Double-Walled (DW) or installed within an FDEP approved secondary containment system. With the exception of dispenser islands and fueling dispenser pumps, most UST components are below grade and not readily visible or readily accessible. Site access to the facility and individual storage tank system and system components shall be provided for FDEP compliance inspections. The following system component photos or images are included to familiarize and assist the owner/operator with identifying critical components to be monitored.

TYPICAL DOUBLE-WALLED USTs



DW-Fiberglass UST Prior to Install



DW-Fiberglass Coated Steel Composite USTs During Installation



DW-Steel Tank with Cathodic Protection



DW-Steel Tank with Sacrificial Anodes Attached



DW-Fiberglass USTs On-site, Pending Installation



DW-Fiberglass USTs During Installation

DOUBLE-WALLED TANKS WITH RELEASE DETECTION METHOD OR DEVICE

A Release Detection (RD) method or device must be installed and monitored within the tank interstice (the space between the inner and outer tank walls) to detect a release and alert the operator. See Release Detection Systems Section (page 27) for options. On a monthly basis, but not exceeding 35 days, inspect and document the condition of any visible component of a storage tank system. For electronic release detection devices, inspect monthly, but not exceeding 35 days, for proper operation and maintain a record of the alarm history, sensor status, and testing results. Perform and maintain records of the annual operability test on the RD device to confirm it is operating in accordance with manufacturer's specifications. Below are examples of UST systems with various interstitial RD devices. If connected to an electronic alarm module, an alarm may be triggered when the inner or outer tank wall is breached.

Facility owners/operators are required to file an Incident Notification Form within 72 hours if the system or component is damaged and may have caused a release or discharge to occur. If a discharge is confirmed, file a Discharge Reporting Form within 24 hours of discovery of the discharge. (See Forms on page 34.)



UST with Brine-filled Interstice



UST Hydrostatic RD Sensor



Brine-filled Interstice RD Sensor



Sensor Cable



Non-discriminating Sensor



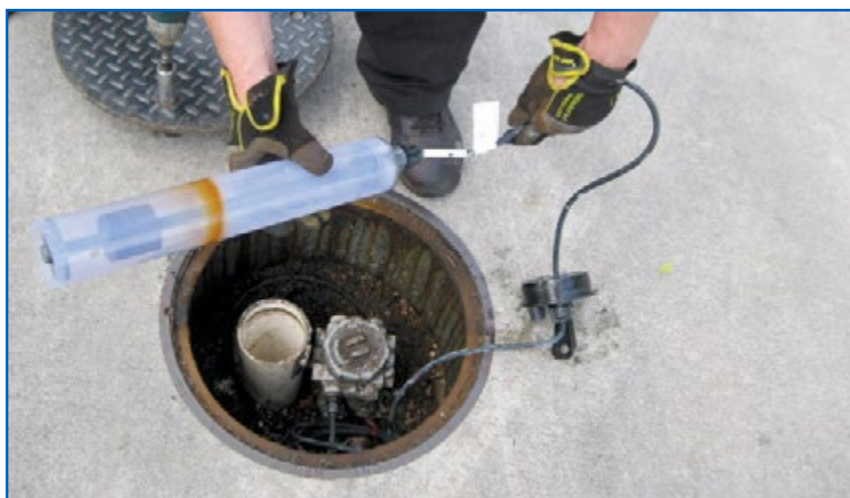
Steel Tanks Micro Sensor



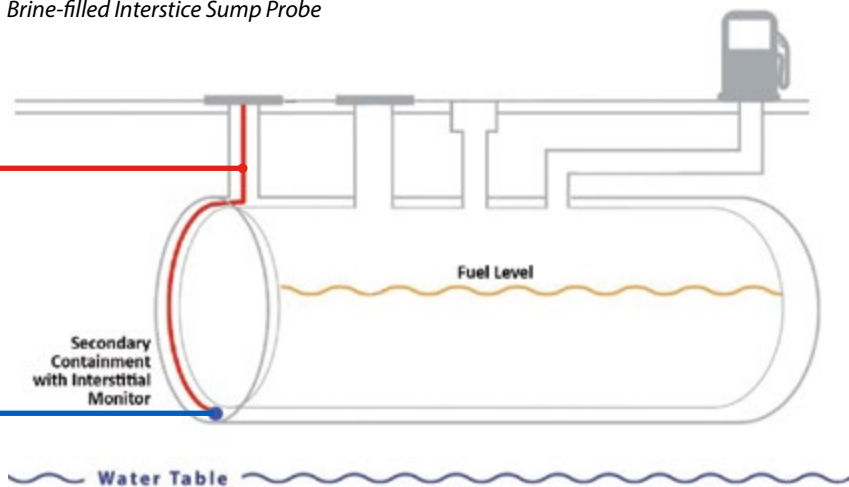
Discriminating Sensor



Discriminating Sensor



Brine-filled Interstice Sump Probe



Dry Secondary Containment with Interstitial Sensor/Probe

SUBMERSIBLE PUMP/PIPING SUMP AND COMPONENTS

The pump/piping sump is typically the lowest point in the piping and connects on top of the UST, below grade, and typically houses the submersible turbine pump, RD sensors, electronic components, and associated pipe fittings and connections. To access the pump/piping sump, remove the manway sump cover with caution to avoid dropping it onto the sump containment cover, which may result in damages. Perform and document the following:

- Monthly, but not exceeding 35 days, check for liquid accumulation and sump integrity.
- Monthly, but not exceeding 35 days, visually inspect the pump head, pipe fittings and Line Leak Detector (LLD) for signs of corrosion, sweating and leaks. If monitored electronically, visually inspect every six (6) months.
- Perform a LLD operability test every 12 months to confirm the LLD functions as required.
- Perform an electronic sensor operability test every 12 months to confirm the sensor functions as required.
- Perform an integrity test on the pump/piping sumps by **October 13, 2018**, and every three years thereafter.



Pump Sump Installation



UST Systems with Sump Manway Covers Opened for Inspection



*Pump/Piping Sump
Manway Cover*



Piping, Pump and LLD inside Sump



Submersible Turbine Pumps (STP)



Sump Cover Closed

Sump Cover Open

SUMP/CONTAINMENT COVER

The sump/containment cover must be fitted tightly to minimize the intrusion of storm water or groundwater into the sump containment, which can result in an accumulation of sufficient quantity to trip the release detection system alarm. Check for cracks or holes and after rain events confirm the sump cover is water tight. Liquids that accumulate in this area should be safely removed and must be properly disposed.

LINE LEAK DETECTOR

This device is located on the submersible turbine pump and is designed to automatically detect, restrict or shutoff flow of fuel to the dispensers when a line leak is detected. There are two types of automatic Line Leak Detectors (LLD), mechanical or electronic. Perform the annual operability test on the LLD at intervals not exceeding 12 months in accordance with the manufacturer's instructions to confirm the system is operating as designed.



Mechanical LLD



Electronic LLD

TEST BOOT FITTINGS

This component is installed at the piping terminus to allow testing of the piping interstitial integrity. Test Boots or Reducing Tees may be used to pressure test the outer wall piping. The boots must be pulled back from the secondary lines, and the reducing tee test port must be unplugged after lines have been tested unless the piping system is designed with a closed interstice and release detection is conducted within the closed interstice. If this is not done, any leakage into the outer wall piping will not flow into the sump to trip the sensor and alert a leak from the primary piping.



Test Boot Installed, Pulled Back After Testing



Test Boot

ENTRY BOOT FITTING FOR DOUBLE-WALLED PIPING

This component is connected to accommodate the fuel piping entry into the pump, piping or dispenser sump. Visually check for damage, sweating, tears or cracks in these fittings.



Entry Boot

Entry Boot with Test Port



Entry/Test Port Boots Installed

FILL/SPILL CONTAINMENT (SPILL BUCKET) AND COMPONENTS

Fill areas are the connections where USTs are filled, typically by a gravity drop through a vertical or remote fill pipe to the UST. The spill bucket located on the fill pipe is used to capture excess fuel that may drain from the tanker truck fill hose after the fill hose is disconnected. Check for liquid accumulation and interior seam integrity. Any liquids that accumulate in the spill bucket should be safely removed and must be properly disposed. Perform integrity testing on double-walled spill buckets or containment systems that are being operated as such, by **October 13, 2018**, and every three years thereafter. Otherwise, perform integrity testing on all single-walled spill buckets or containment systems at intervals not exceeding 12 months.



Fill Pipe with Fill Cap Secured



Fill/Spill Containment (Spill Bucket)



Fill Drop Tube



Fuel Truck Fueling UST

FILL CAPS

Except during filling, the fill caps must remain on the fill pipe to prevent debris and surface/groundwater from entering the UST. The fill cap should be lockable and watertight, so check that the fill cap gasket is in place and secure.



Fill Cap



Fill Cap on Fill Pipe

SPILL RELEASE VALVE

The Spill Containment Release Valve is located inside the Spill Bucket and must only be used to release fuel from the spill bucket back into the tank (typically used during refueling of the tank). Any other liquids that accumulate in the spill bucket should be safely removed and must be properly disposed.



Release Valve



Release Valve in Spill Bucket

Spill Bucket Cutaway

OVERFILL PROTECTION VALVE OR METHOD

This device or other approved method (such as a high level alarm system) is required on all USTs to prevent an overfill event during fuel deliveries. Depending on the device used, flow into the UST may be restricted or an alarm may sound at the 90 percent capacity and in general flow into the UST is stopped at the 95 percent capacity. Overfill protection devices must be tested every 12 months for proper operation.

Ball float valves may not be used when overfill protection is installed.



Overfill Automatic Shutoff Flapper Valve



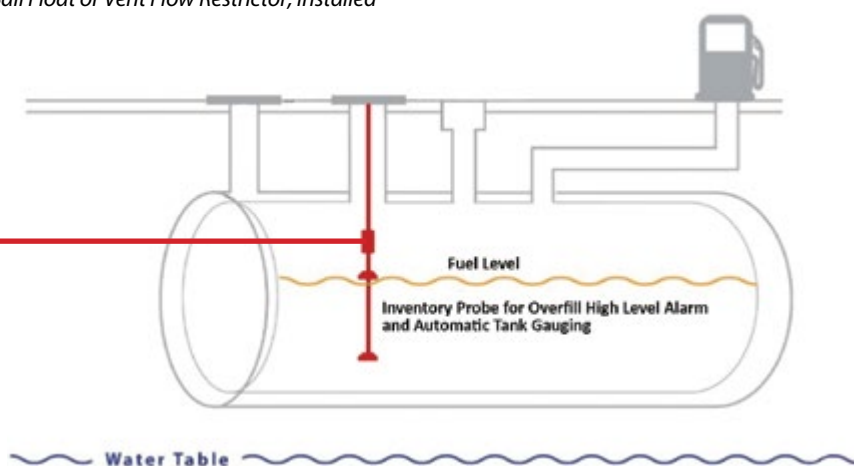
Ball Float Valve



Ball Float or Vent Flow Restrictor; Installed



Automatic Tank Gauging (ATG) Probes



Overfill High Level Alarm System Using Automatic Tank Gauging

STAGE I DRY BREAK POPPET AND CAP WITH GASKET



Stage I Vapor Recovery Color-coded Sump



Fuel Delivery with Stage I Engaged



This component is used to return gasoline vapors back to the delivery truck tank compartment and prevents the release of gasoline vapors into the atmosphere. Press the spring loaded valve in the center for spring compression reaction and to check for a tight seal. Poppet caps should be in place at all times except when storage tanks are being fueled. Ensure the cap gasket is secure and cap fits tightly onto the dry break poppet.



Stage I Dry Break Poppet



Dry Break Cutaway



Vapor Recovery Poppet Cap

UNDERGROUND DOUBLE-WALLED PIPING ASSEMBLY AND COMPONENTS

All underground piping in contact with soil must be double-walled or installed inside an FDEP approved secondary containment system. Pipes should slope back to USTs to ensure that, in the case of any line break, product will flow back towards the UST and pumps/piping sumps. It is unlikely pipes will be visible for inspection except for the pipe fittings within the pumps/piping sump. Check for tears and breaks on the Flex Pipe and fittings located inside the pumps/piping sump.



Primary Fiberglass Fuel Line/Piping



Double-walled Flexible Piping Layout



Flex Pipe Fitting in Dispenser Sump



Flex Pipe Fitting



Flex Pipe Fitting in Pump/Piping Sump



Double-walled Fiberglass Piping Layout

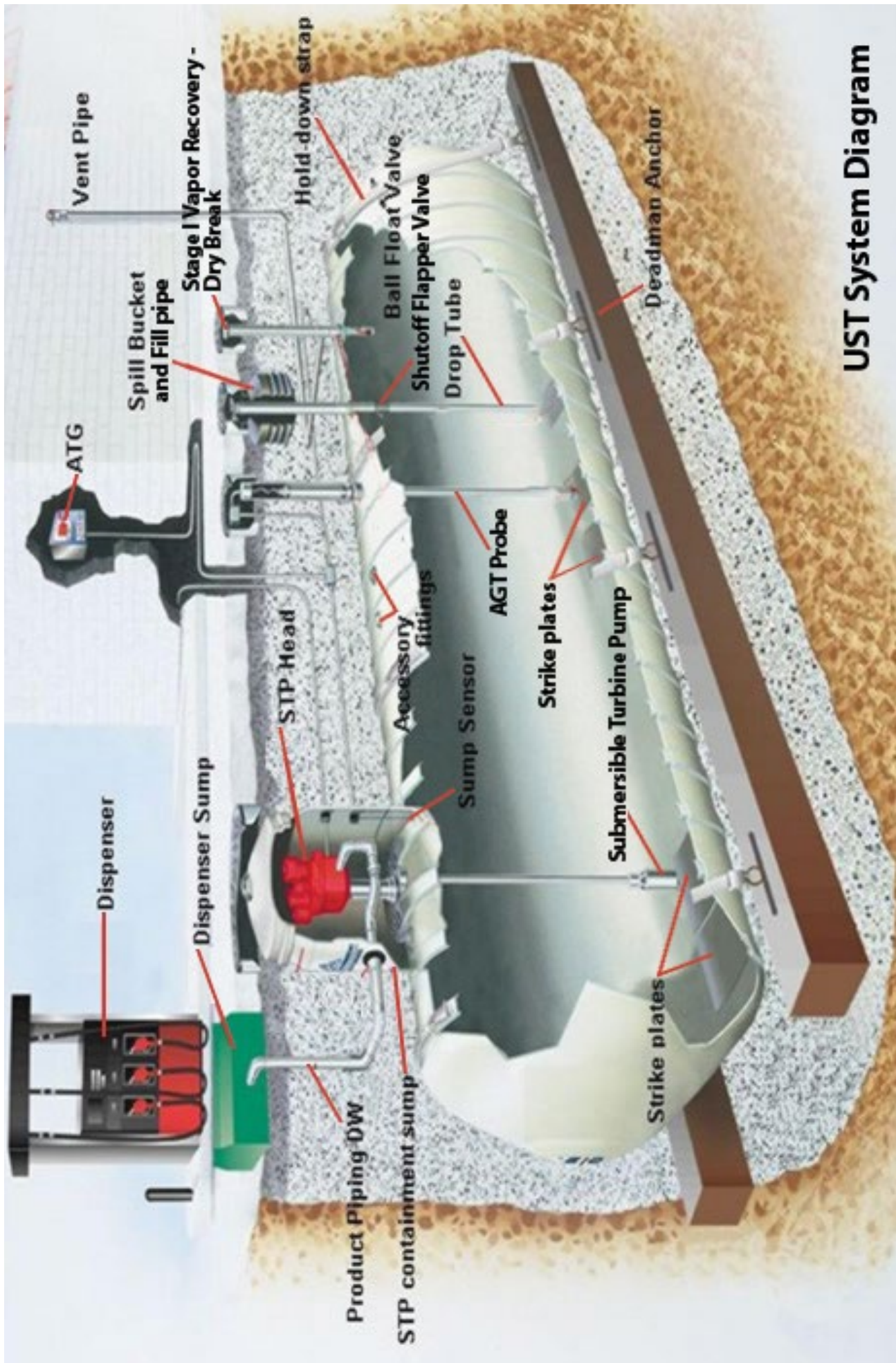


Double-walled Flexible Primary Piping



UST System Piping/Dispenser Liner Installation

Underground Storage Tank Systems



ABOVEGROUND STORAGE TANK SYSTEMS

All Aboveground Storage Tanks (AST) must be double-walled or installed within an impervious secondary containment. With the exception of connected underground piping, most storage tank components of ASTs are above grade and readily visible or accessible. Aboveground piping not in contact with soil is not required to have secondary containment unless the piping extends over water. Site access to the facility and individual storage tank system and system components shall be provided for FDEP compliance inspections. The following system component photos and images are included here to assist the owner/operator in identifying critical components to be monitored.

TYPICAL ASTs



Horizontal DW-AST



Horizontal SW-AST within Secondary Containment



Vertical SW-AST within Secondary Containment



SW-AST with Dispenser within Secondary Containment



Sub-base DW-Emergency Generator AST



DW-AST with Dispenser within Containment

TANK ASSEMBLY AND COMPONENTS

ASTs must be installed on a sound foundation (e.g. reinforced concrete pad) that will provide the necessary support, strength and stability to withstand various environmental conditions. On a monthly basis, but not exceeding 35 days, visually inspect areas or components that can be inspected for any problems such as component corrosion or signs of a release. Record these monthly checks in a log to show that the inspections are being completed. Routine inspection will identify problems early, before they develop into serious issues, and will ensure the equipment works to reduce emissions and leaks.

DOUBLE-WALLED TANK WITH RELEASE DETECTION METHOD OR COMPONENTS

Double-walled ASTs must be equipped with a visual, mechanical or electronic Release Detection (RD) system located in the tank interstitial space (the space between the inner and outer tank walls) to detect a release and alert the operator of this incident. See Release Detection Systems Section (page 27) for options. On a monthly basis, but not exceeding 35 days, inspect the tank shell, pipes and fittings for leaks, usually demonstrated by uncontrolled corrosion/pitting or paint discoloration. Perform an annual operability test every 12 months on the RD system in accordance with the manufacturer's instructions to confirm the system is operating as designed.

Facility owners/operators are required to file an Incident Notification Form within 72 hours if the system or component is damaged and may have caused a release or discharge to occur. If a discharge is confirmed, file a Discharge Reporting Form within 24 hours of discovery of the discharge. (See Forms on page 34.)



DW-AST with Spill Containment, Anti-siphon Valve and RD



Mechanical RD Gauge

SINGLE-WALLED TANK INSIDE FIELD ERECTED SECONDARY CONTAINMENT OR DIKE

Single-walled ASTs shall have a secondary containment dike that is constructed to contain 110 percent of the largest tank capacity volume and is structurally sound to withstand hydrostatic forces of the contained volume of the liquid stored. AST secondary containment must be constructed of impervious materials and be sealed and properly coated to prevent any fuel or sweating on the ground area around the secondary containment. All aboveground fuel storage tanks must be labeled (by name) as to the specific type of fuel that is being stored in each tank (e.g., diesel, gasoline, waste oil, etc.). ASTs located inside a dike area are subject to storm water accumulation which must be managed and properly disposed. Check accumulated storm water for sheen or floating product before disposing. RD requirements are met when you perform monthly inspection checks for the following and record your findings.

1. Check tank coating integrity.
2. Check tank foundation and supports for cracks and signs of corrosion.
3. Check secondary containment integrity.
4. Inspect containment for liquid accumulation.
5. Check drain valve area for leaks (must be lockable and secured when not in use).
6. Check vent lines to ensure vent caps are in place.
7. Check for proper dimensions of containment volume (at least 110 percent of the largest tank volume).
8. Check roof integrity after a storm event for any leaks.

SINGLE-WALLED TANK INSIDE FIELD ERECTED SECONDARY CONTAINMENT OR DIKE

Aboveground Storage Tank Systems



Check Tank Coating and Secondary Containment Integrity



Check Tank Foundation and Anchoring



Check Drain Valves for Leaks. Ensure they are Locked when Not in Use



Check for Proper Secondary Containment Dimensions



Check Roof for Integrity for Leaks, Especially after a Storm Event



Check Secondary Containment for Discharge or Liquid Accumulation

PUMP/PIPING SUMP AND COMPONENTS

With the exception of an underground remote fill system or underground piping to dispensers or other endpoint equipment, pump sumps typically are not installed on ASTs. Suction or Submersible Turbine Pumps (STP) are used to deliver fuel to the dispensing or auxiliary equipment as needed. Suction pumps are typically located at the dispenser or auxiliary equipment (e.g., diesel power generator) while the STPs are located at and inside the AST.



AST with Suction Pump at Dispenser



AST with STP connection on top of the Tank

FILL/SPILL CONTAINMENT AND COMPONENTS

Fill areas are the connections where ASTs are filled, sometimes under pressure through an aboveground vertical or remote fill pipe to the AST. Storage tanks that are loaded by trucks shall be installed with a spill containment system at each tank fill connection, except for tank fill connections located within dike field areas with secondary containment or within tank truck containment areas. The spill containment located at the fuel fill area is used to capture excess fuel that may drain from the tanker truck fill hose after the fill hose is disconnected. Check for liquid accumulation and interior seam integrity for corrosion and liquid tightness. Any liquids that accumulate in this area should be safely removed and must be properly disposed. Check for cracks or holes and after rain events to confirm the sump cover is water tight.



AST Spill Containment on Tank Top



AST Remote Fill/Spill Containment



Miscellaneous Types of AST Spill Containment

OVERFILL PROTECTION VALVE OR METHOD

An approved method of overfill protection (such as a visual gauge, liquid flow cutoff device or high level alarm ATG system) is required on ASTs to prevent an overfill event during fuel deliveries. AST tight fill overfill devices are designed for high pressure and high volume fueling. This device, located in the fill pipe inside the AST, shuts off product flow to the AST when the fuel tank level reaches 90 percent of its fill capacity. Perform an operability test on this device annually at intervals not exceeding 12 months in accordance with the manufacturer's instructions to confirm the system is operating as designed.



Tight-Fill Overfill Devices



Clock Gauge Liquid Level Overfill Method



Tank Overfill Audio Visual Alarm



Clock Gauge with High Level Alarm



Clock Gauge with High Level Alarm and Float

FILL PIPE WITH CAP

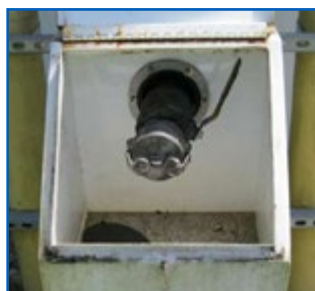
Fill pipe connections are typically below the AST fuel level and will have fuel trapped in the line above this connection with a one-way check valve. Fill caps should be lockable and liquid tight. Check that the cover gasket is in place and secure to prevent leaks from the fuel line when not in use.



Fill Cap



Fill Cap with Gasket



Fill Cap on Fill Pipes



RELEASE VALVE

This valve is located inside the spill containment and must only be used to release fuel from the fill containment back into the tank (typically used during refueling of the tank). Any other liquids accumulated in this area should be safely removed and must be properly disposed.



AST Spill Containment with Release Valve on Tank Top



Release Valve

STAGE I DRY BREAK POPPET AND CAP WITH GASKET



Stage I Dry Break Poppet



Dry Break Cutaway



Vapor Recovery Poppet Cap

This component is used to return gasoline vapors back to the delivery truck tank compartment. Press the spring loaded valve in the center for spring compression reaction. Poppet caps should be in place at all times except when storage tanks are being fueled. Ensure cap fits tightly.

PIPING ASSEMBLY AND COMPONENTS

With the exception of piping over water, all aboveground piping not in contact with soil is not required to have secondary containment and is typically of metallic construction. On a monthly basis, but not exceeding 35 days, inspect these pipes and fittings for leaks, often demonstrated by uncontrolled corrosion/pitting or paint discoloration.



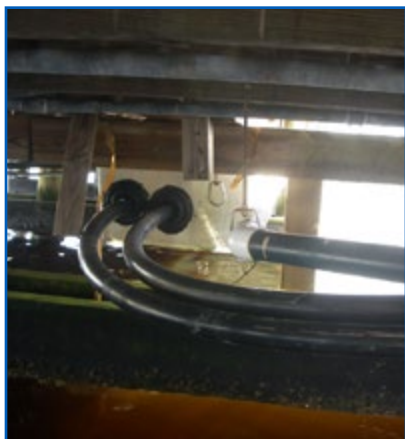
Piping for Shop Fabricated AST



Piping for Field Erected AST



Bulk Product Piping



DW-semi-rigid Pipe Over Water



Aboveground SW-pipe Transition to Underground DW-pipe

LINE LEAK DETECTOR

The Line Leak Detector (LLD) is located on the Submersible Turbine Pump (STP) and is designed to automatically detect, restrict or shut off flow of fuel to the dispensers when a line leak is detected. There are two types of automatic LLDs, mechanical or electronic. All pressurized small diameter integral piping that is in contact with the soil must be installed with LLDs and must be located downstream from the anti-siphon or solenoid valve, as applicable. LLDs are not required for piping that is not in contact with the soil. The LLD must be tested annually at intervals not exceeding 12 months for operability in accordance with the manufacturer's instructions to confirm the system is operating as designed.



Electronic LLD



Mechanical LLD

ANTI-SIPHON VALVE

An anti-siphon valve must be installed when the storage tank produces a gravity head on small diameter piping positioned below the storage tank product level to prevent a release of product in the event of a pipe/fitting leak or pipe rupture.



Anti-siphon Valve



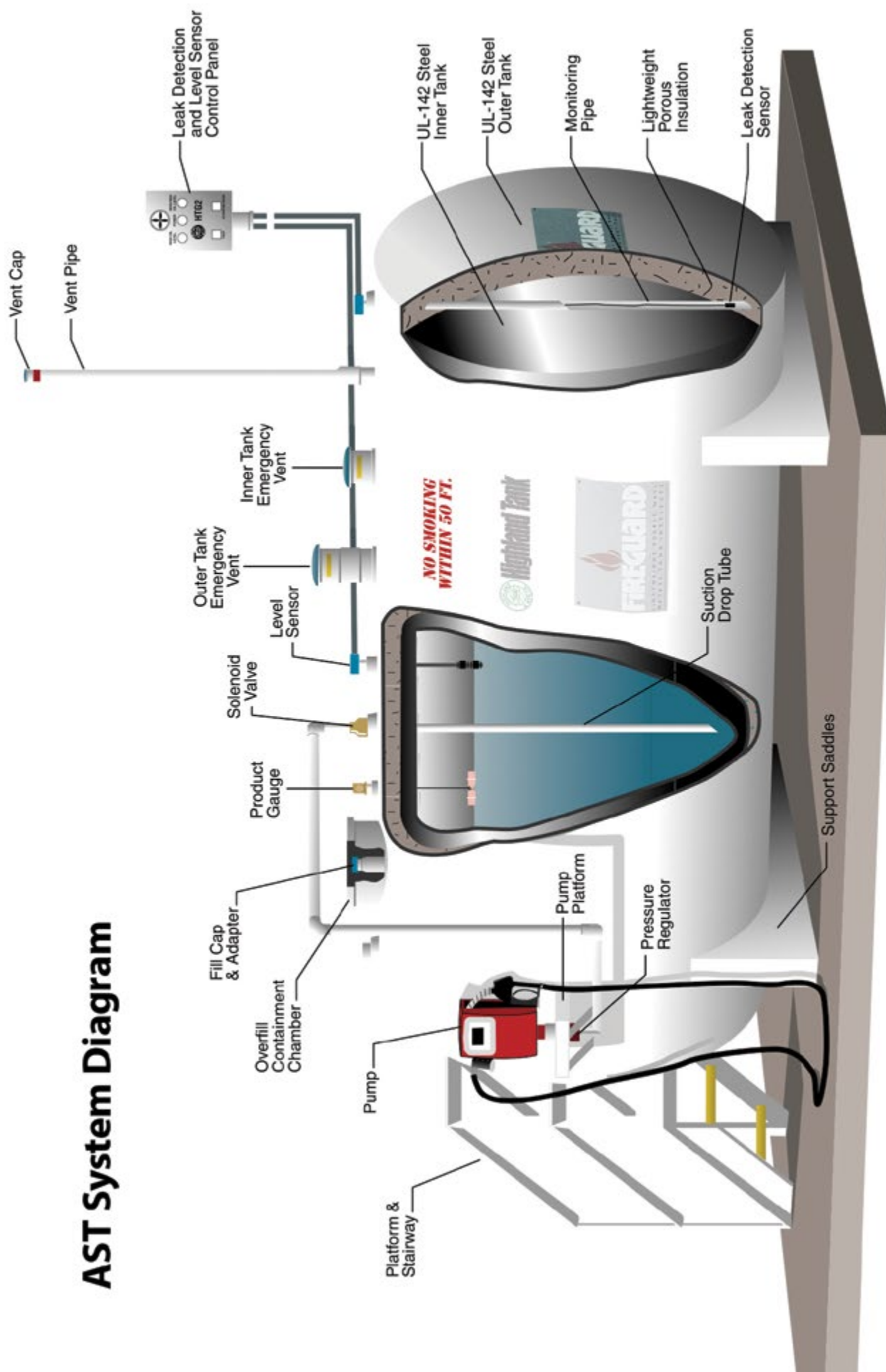
Anti-siphon Valve with Isolation Ball Valve



Anti-siphon with Isolation Ball Valve

Aboveground Storage Tank Systems

AST System Diagram



COLOR CODING FOR FILL PORT COVERS

Fill ports, where USTs or ASTs are filled, require the fill covers be color-coded as illustrated below. This helps prevent accidental filling of the wrong fuel into the wrong tank. Ensure that the covers are maintained as required.



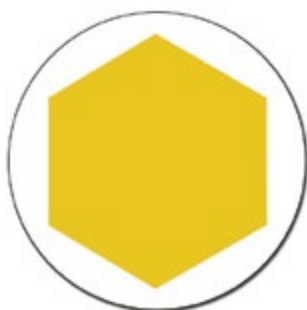
Hi-Grade (Premium) Fill Cover



Mid-Grade Fill Cover



Low-Grade Unleaded Fill Cover



Low Sulfur Diesel Fill Cover



Used Oil Fill Cover



High Sulfur Fill Cover



Stage I Dry Break Cover



No. 1 Fuel Oil Fill Cover



No. 2 Fuel Oil Fill Cover



Kerosene Fill Cover

ALCOHOL-BASED FUELS



M85 Ethanol Fill Cover



Hi-Grade Fill Cover



Mid-Grade Fill Cover



Low-Grade Fill Cover

DISPENSER ASSEMBLY AND COMPONENTS

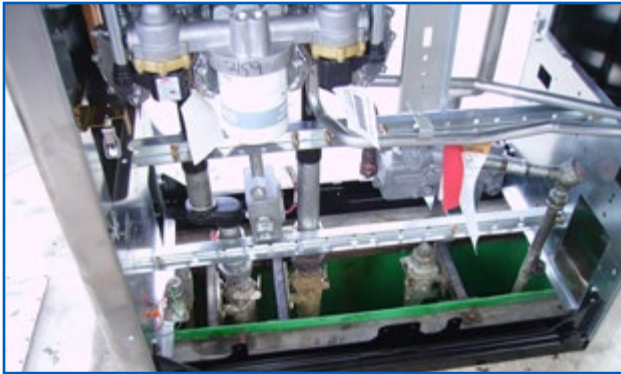
Dispenser covers should be lockable and the operator must be available to provide access for inspection. When looking inside the dispenser, check the pipe fittings, emergency shut off (shear) valves (confirm you have one on each fuel line), fuel filters, dispenser sumps/liners or secondary containment, leak detection sensors (if any), and cathodic protection anodes (if any). (Note: your dispenser may not need all of these items.) Perform an integrity test on below-grade dispenser sumps by **October 13, 2018**, and every three years thereafter.



Dispenser/Fuel Pumps



Accessing Inside the Dispenser



View of Dispenser Sump



Dispenser Installations



Various Fuel Filters



Fuel Filter, Installed in Place

FUEL FILTERS

Check filter connection and condition on each fuel line for signs of leaks. Change when necessary.



Miscellaneous Dispenser Islands

DISPENSER ISLANDS

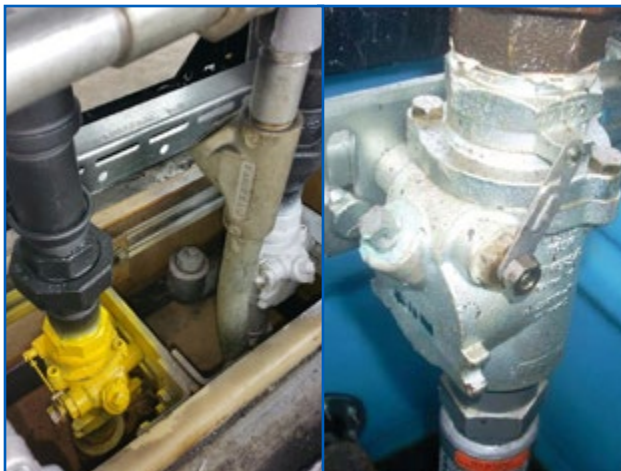
Keep traffic pathway free from open cans, containers or foreign objects to avoid costly accidents.

EMERGENCY SHUTOFF OR SHEAR VALVE FOR PRESSURIZED PIPING

Shear valves are used to prevent the release of fuel in the event the dispenser is dislodged or knocked off its foundation. Check the valve lever and the connection to the bracket, as shown. There should be one shear valve for each fuel line.



Emergency Shut-off Shear Valves



Shear Valves Secured to Brackets



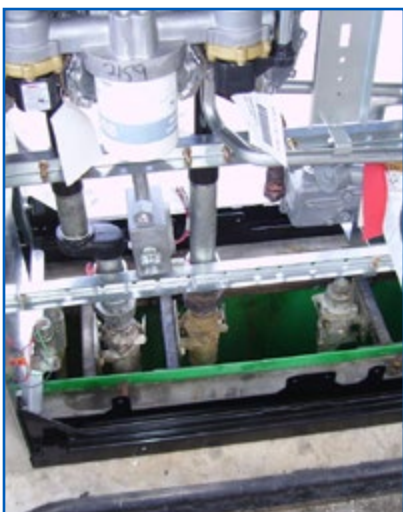
Various Shear Valves Installed at Correct Height. Note Valve Anchoring to Dispenser Box

ELECTRONIC LEAK DETECTION SENSOR INSIDE DISPENSER SUMP

Check that the wire connections are secure. Check height and position of the sensor from the sump and secondary containment bottom, as per manufacturer's instructions. The release detection system should alarm when there is a fuel leak or an excessive amount of liquid in the dispenser sump. Check for cracks and for an excessive amount of liquid in the sump. Liquid must be pumped out safely and properly disposed.



Discriminating Dispenser Sump Sensor



Dispenser Sump



Sensor Placed Near Sump Bottom



Dispenser Sump Sensor/Cable

STANDARD DISPENSER NOZZLES, HOSES AND APPURTENANCES

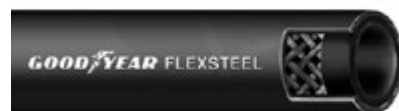
Nozzles may develop leaks from constant use. Check for leaks and drips from the nozzle spout, hose and connections. Also check for excessive wear and cracking of the dispenser hoses.



Various Gasoline and Diesel Nozzles



Dispenser Hoses



Hose Cutaway



Dispensers, Nozzles, Hoses and Appurtenances



Whip Hose



Swivel-ends Hoses



Various Breakaways



Swivel Breakaway



Reconnectable Breakaways



VENT LINES ASSEMBLY AND COMPONENTS

Vent lines allow pressure within the tank to equalize when product is removed from or introduced into the tank. The Pressure-Vacuum (P/V) and standard vent valves are typically used at gasoline dispensing facilities. The P/V valves are required on gasoline UST/ASTs' vent lines per Chapter 62-252, F.A.C., Gasoline Vapor Control, and the fire codes, as applicable.



Vent Lines with Valves Installed



Vent Valves Extend 12 feet Above Grade

Note: Vent lines should extend a minimum of 12 feet above ground level, checked periodically and cleared of dust, rust or debris accumulation for proper functioning.

PRESSURE/VACUUM OR REGULAR/STANDARD VENT VALVES

This valve must be in place at all times per Chapter 62-252, F.A.C., Gasoline Vapor Control, and the fire codes, as applicable. This also prevents debris from falling into the tank.

Standard vents installed on the top of vent pipes from underground or aboveground diesel fuel storage tanks are always open to the atmosphere to allow any pressure or vacuum in the tank to vent.



Pressure/Vacuum Vents



Standard Vents

STORAGE TANK VENT LINES

Each vent line is associated with one underground tank unless manifolded. A P/V or regular vent valve must be in place for each vent line.



Aboveground Manifold



Underground Manifold

VENT LINES MANIFOLD

Vent lines may be manifolded where this type of assembly requires only one P/V or regular vent valve.

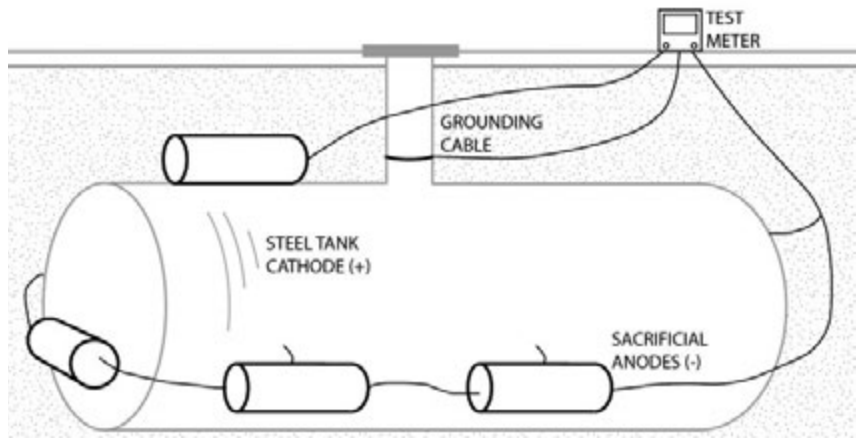
Cathodic Protection Systems

Cathodic Protection (CP) is used to control the corrosion of metallic storage tank systems by connecting the metal components to be protected to a more easily corroded sacrificial anode. The sacrificial anode then corrodes instead of the protected components. For pipelines or field erected, steel ASTs in contact with soil, where sacrificial anodes may not be adequate, an external electrical power source (rectifier or impressed current) is used to provide sufficient current to protect the metal components.

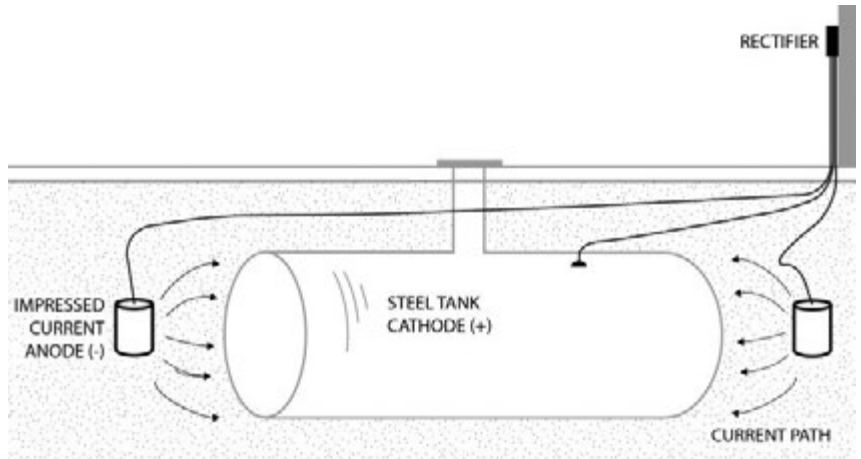
Cathodic protection test stations are typically required and located close to the structure that is protected to allow periodic testing to confirm adequate corrosion protection is maintained on the system. Check the wire connection to the anode from the steel tank or pipe.

Cathodic protection systems must be tested by a corrosion professional. Factory installed galvanic anode systems are to be tested every three years. Impressed current systems typically have an Amp and Volt meter console that maintains a steady voltage-current supply to the protected structure. Check Volt-Amp readings every 60 days to confirm designed output readings are maintained. Impressed current systems and field installed sacrificial anode systems must be tested annually.

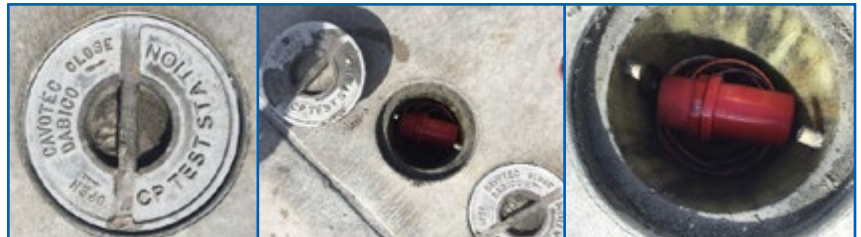
CATHODIC PROTECTION SYSTEMS



Galvanic CP System with Sacrificial Anodes Attached



Impressed Current CP System



CP Test Stations



Impressed Current Rectifier with Voltmeter and Ammeter



Sacrificial Anode Install

RELEASE DETECTION SYSTEMS

All facilities are required to have internal or external release detection equipment or methods for their storage tank systems. On a monthly basis, but not exceeding 35 days, inspect and document the condition of any visible component of a storage tank system. Release detection, interstitial monitoring or overfill protection equipment or devices are required to have an annual operability test to determine if these devices are functioning as designed and in accordance with the manufacturer's specification. (Please refer to Chapter 62-761 and Chapter 62-762, Florida Administrative Code, for more information.) Existing UST systems that store fuel solely for use by emergency power generators must meet release detection requirements by **October 13, 2018**.

Facility owners/operators are required to file an Incident Notification Form within 72 hours if the system or component is damaged and may have caused a release or discharge to occur. If a discharge is confirmed, file a Discharge Reporting Form within 24 hours of discovery of the discharge. (See Forms on page 34.) Following are various types of Internal and External Release Detection systems used.

INTERNAL RELEASE DETECTION SYSTEMS

An internal release detection system or method is designed and operated within the storage tank system to alert the owner/operator of a release or incident before the regulated substance stored is released or discharged to the environment. Internal release detection systems may be monitored via visual, mechanical, manual or electronic means to detect a release into the tank/pipe secondary containment or interstice. Visual or mechanical systems may use a float gauge, dip-stick or other visual means to monitor the interstice.

Visual, Mechanical or Manual Monitoring Release Detection Components Typically Used in ASTs



AST Float Gauge Installed



Measuring Stick



Visual monitoring

Electronic Interstitial Monitoring Typically Used in AST and UST Systems

Currently, there are electronic systems that provide continuous, intermittent or on-demand displays or printouts of operating and alarm status records. These may include in-line leak detector monitoring, pipe/dispenser sump monitoring, DW-UST/AST interstitial release detection monitoring and test history. Electronic interstitial monitoring systems detect product that leaks from the primary containment towards an interstitial monitor or probe/sensor located in the lowest level between the primary and secondary containment walls. Electronic interstitial monitoring systems may also detect water that enters the interstice through a breach in the secondary containment.

INTERNAL RELEASE DETECTION SYSTEMS



Touch Screen Console



Audio/Visual Consoles



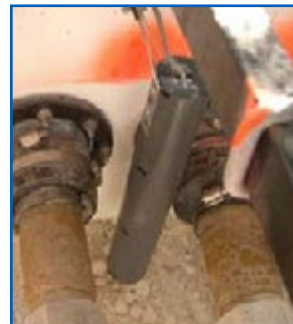
Installed Audio/Visual/Print Console



Discriminating Sump Sensors



Sensor Float in Pump Sump



Sensor Float in Dispenser Sump



Sensor for Brine-filled DW-UST



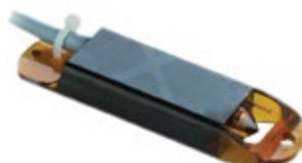
UST Wraparound Sensor and Cable



Hydrostatic Sensor Located in Tank Top Reservoir



Non-discriminating Interstitial Sensors



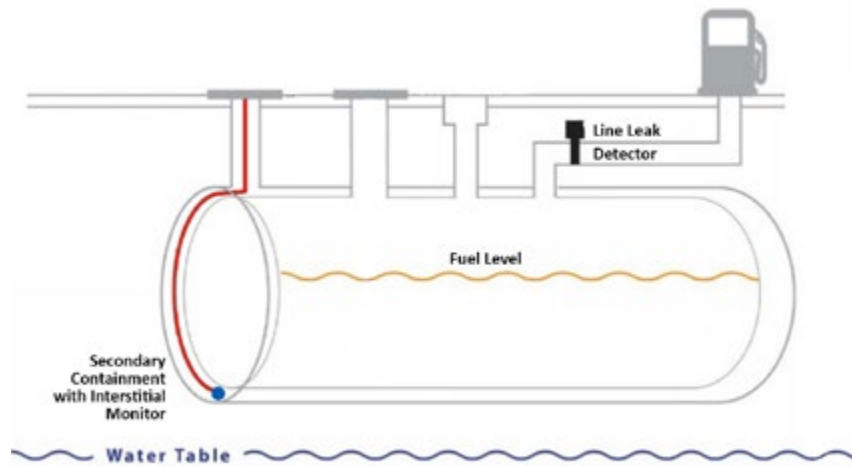
Discriminating Interstitial Sensors



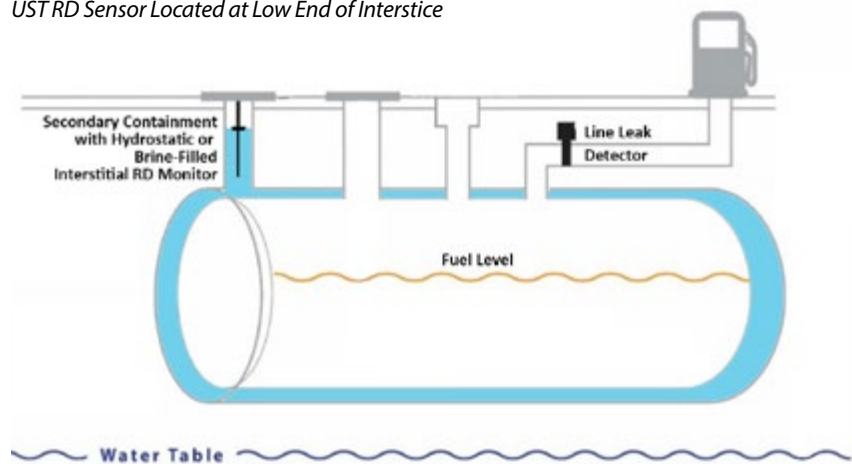
INTERNAL RELEASE DETECTION SYSTEMS

General System Checks and Recordkeeping for Release Detection

- Check any component that can be visually inspected monthly, but not exceeding 35 days, unless equipped with an electronic sensor. If equipped with an electronic sensor, visually inspect every six (6) months and record your findings.
- Electronic, mechanical or visual interstitial monitoring must be conducted for all DW-USTs, DW-ASTs and DW-underground piping.
- All release detection devices shall be tested annually at intervals not exceeding 12 months to ensure proper operation in accordance with manufacturer's specifications.



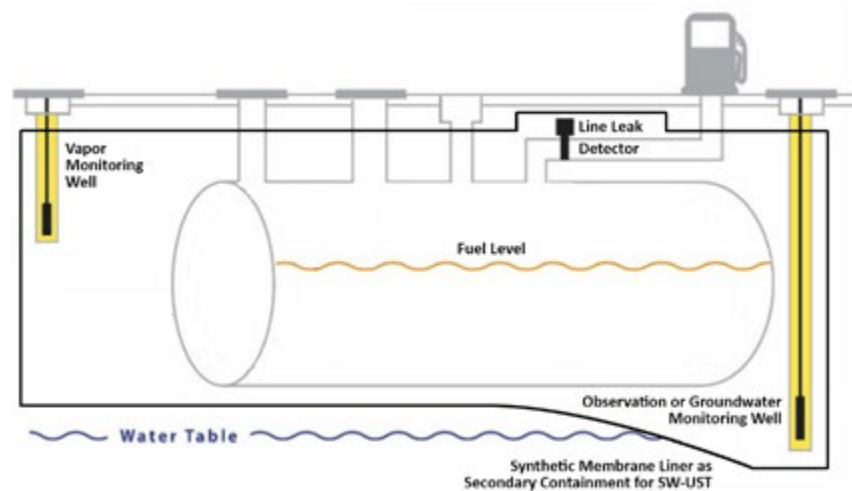
UST RD Sensor Located at Low End of Interstice



UST with Brine-filled RD Monitor

EXTERNAL RELEASE DETECTION SYSTEMS - GROUNDWATER AND VAPOR MONITORING WELLS

External release detection systems monitor the presence of regulated substances in groundwater or soil that is in contact with the storage tank system. This type of release detection may be used only at existing facilities with single-walled USTs that are installed within an FDEP approved synthetic membrane liner or existing bulk product storage facility with specific FDEP approval. If you have Monitoring Well(s) (MW), it/they must be checked monthly, but not exceeding 35 days, for visible sheen, floating product or electronic alarms (when used) and the results recorded. Inspectors will always look for these results.



UST Vapor and/or Groundwater Monitoring Wells

EXTERNAL RELEASE DETECTION SYSTEMS - GROUNDWATER AND VAPOR MONITORING WELLS

Compliance Monitoring Well, Casing and Cover

(Black triangle on white cover).



MW Casings, Covers

Compliance/Monitoring Well Containment with Grouting at Bottom

Routinely check grouting with a screwdriver or equivalent to ensure the grouting is intact. (Solid grouting is necessary to prevent surface runoff or spills from entering the soil through the well containment area.)

Compliance/Monitoring Well with Lockable Cap

Well cap must be kept locked or secured with lock or clips. Lock keys must be available onsite. The cap must be watertight. Provide suitable warning signs to fuel delivery drivers to prevent accidental fuel filling, e.g. MW - DO NOT FILL.



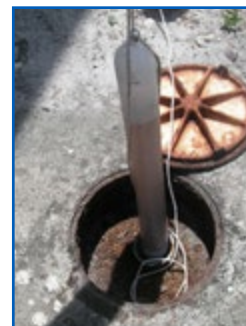
Various Compliance/Monitoring Well Caps

Compliance/Monitoring Well Pipe

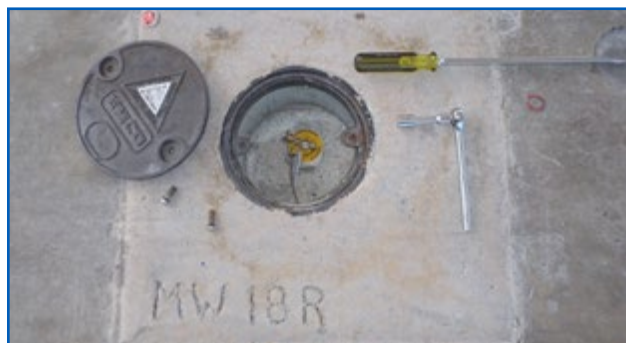
This pipe must be a minimum of at least one inch above the surface of the grouting (to help prevent standing contaminated liquid from entering into the well when the cap is removed).



Installed MW with Color-coded Cover



Bailing the MW



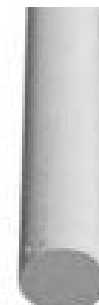
Installed MW with Grout Intact



Cap in Place



MW Slotted Pipe



EXTERNAL RELEASE DETECTION SYSTEMS - GROUNDWATER AND VAPOR MONITORING WELLS

Compliance or Monitoring Well Acrylic Bailer with Cord

Keep the bailer and cord clean. When sampling wells, care should be taken if one well has signs of contamination (otherwise, wells will be cross contaminated). Bailers should be cleaned between each well sampling. A disposable bailer may be used.



Acrylic Bailer/Cord



Visual Check for Sheen or Free Floating Product

Compliance or Monitoring Well Discriminating Electronic Probe

This system is designed to differentiate product or contamination from groundwater and/or background levels. Check the integrity of wires and connections.



Old Discriminating Electronic Probe Pulled Out of Well, Pending Replacement

Assessment/Monitoring Well

Assessment wells (similar to MW in design) are installed and used to collect, monitor and analyze groundwater samples for the presence of contaminants of concern. Assessment wells may be located onsite at locations greater than 10 feet from the storage tank system to track contaminant levels and groundwater flow as required. Assessment wells are differentiated by a solid white circle on a black cover.



Assessment Well



Compliance Well

IT'S GOOD FOR YOUR BUSINESS AND IT SAVES INSPECTION TIME!

Regulations require owners/operators to maintain certain records about their storage tank system for inspection. Inspectors will ask to see these records.

DISPLAY THE FOLLOWING DOCUMENTS WHERE EVERYONE CAN SEE THEM

- The current FDEP Registration Placard. Remember to check the placard for the proper address. The placard is issued annually following payment of the registration fees.
- Current local government permit(s), if applicable.

KEEP THE FOLLOWING RECORDS AT THE STORAGE TANK FACILITY ON FILE FOR EASY ACCESS AND REVIEW

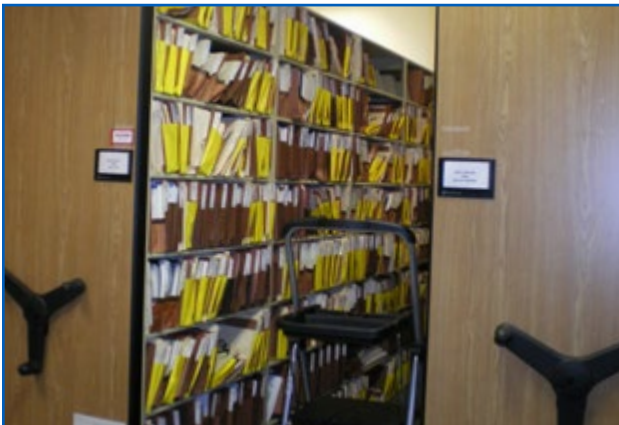
Keep these Records for At Least Three Years

- All monthly visual inspection results of the condition of any storage tank system component that can be visually inspected and that contains, transfers or stores regulated substances.
- Electronic release detection equipment monthly function checks.
- All test data and results gathered during annual operability tests and integrity tests.
- Repair, operation and maintenance records.
- Records of the types of fuels stored per tank.

Keep these Records until Storage Tank System Closure

- Manufacturer's instructions for operation, maintenance and testing release detection equipment.
- Demonstrating methods of financial responsibility.
- DRF, INF and results of all incident investigations.
- Installation, maintenance, inspections and testing of corrosion and cathodic protection systems.
- Storage system installations, replacements, recertification and upgrades.
- Closure integrity report, closure report or limited closure report, and release detection inspection report for out-of-service storage tank systems.
- Survey drawings of installed or relocated storage tank/piping systems signed and sealed by a Professional Engineer or Professional Land Surveyor licensed in the state of Florida.
- Records of current training certificates for designated Class A, B, and C operators shall be maintained for as long as the operators are designated for that facility.
- Records documenting compliance with compatibility of storage tank systems and system components storing regulated substances containing ethanol blends greater than 10 percent and biodiesel blends greater than 20 percent, as required.

Note: Facility operators must complete training and secure certification, no later than October 13, 2018, as required, to ensure the proper operation and maintenance of the storage tank system.





Discharge Reporting Form (DRF)

Facility Registration Form

Incident Notification Form (INF)

Equipment Registration Form

Registration Placard

Financial Mechanisms

UST Install and Removal Form

Closure Integrity Evaluation Report Form

Limited Closure Report Form

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION RULES AND FORMS

The following Rules and associated Forms may be accessed at the FDEP website:

<https://floridadep.gov/waste/permitting-compliance-assistance/content/storage-tank-system-rules-forms-and-reference>

Rules

Chapter 62-761, F.A.C.

Underground Storage Tank Systems (USTs)

» [Rule Text](#)

Chapter 62-762, F.A.C.

Aboveground Storage Tank Systems (ASTs)

» [Rule Text](#)

Rule Forms

Underground Storage Tanks Systems

- » [Discharge Report Form](#)
- » [Facility Registration Form](#)
- » [Financial Mechanisms Form](#)
- » [Alternative Requirement or Procedure Form](#)
- » [UST Installation and Removal Form](#)
- » [Incident Notification Form](#)
- » [Closure Integrity Evaluation Report Form](#)
- » [Limited Closure Report Form](#)
- » [Equipment Registration Form](#)
- » [UST Closure Site Check Process Flowchart](#)
- » [Instructions for Conducting a Site Check During UST Closure](#)

Aboveground Storage Tanks Systems

- » [Discharge Report Form](#)
- » [Facility Registration Form](#)
- » [Alternative Requirement or Procedure Form](#)
- » [Incident Report Form](#)
- » [Closure Integrity Evaluation Report Form](#)
- » [Limited Closure Report Form](#)
- » [Equipment Registration Form](#)
- » [Containment and Integrity Plan Certification Form](#)
- » [AST Closure Site Check Process Flowchart](#)
- » [Instructions for Conducting a Site Check During AST Closure](#)

Self Service Registration Online

[Storage Tank Registration Electronic Self Service Application \(ESSA\) Portal](#)

Suggested AST and UST Monthly Checklists (Pages 36-37)

LIST OF ACRONYMS

ATG	Automatic Tank Gauging
AST	Aboveground Storage Tank
CP	Cathodic Protection
DRF	Discharge Report Form
DW	Double-Walled
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
INF	Incident Notification Form
LLD	Line Leak Detector
MW	Monitoring Well
P/V	Pressure/Vacuum
RD	Release Detection
STP	Submersible Turbine Pump
SW	Single-Walled
UST	Underground Storage Tank

List of Acronyms



AST System Monthly Visual Inspection Checklist						
Facility Name: _____		Date _____	Year _____			
Facility ID: _____		Tank # _____	Type: SW in secondary containment _____	DW _____		
AST SYSTEM	Standards Checklist	Yes	No	N/A	Initials	Comments
Tank	Tank exterior maintained, not corroded or damaged					
	Overfill protection method check					
	Overfill alarms functioning properly					
	Containment not damaged					
Secondary Containment	Clean, empty, and no water, product or debris					
	Liquid removed from inside containment area					
	Drain valve is closed, secured and not leaking					
	Fill cover is in good condition and properly color coded					
Fill Port/Spill Bucket	Fill cap is tightly sealed, gasket is in good condition					
	Clean, empty, no water, product or debris					
	Anti-siphon valve in working order					
	Piping not in contact with soil/debris					
Piping	Piping exterior not corroded or damaged					
	Electronic interstitial monitoring status not in alarm					
	Visual interstitial monitoring (Krueger gauge, stick, etc.)					
	Electronic monitoring system check					
Release Detection	Shear valves properly anchored					
	Sump clean, empty, and has no water, product or debris					
	Piping maintained, not corroding or leaking					
	Fittings not kinked, cracked, torn, or leaking					
Dispenser	Sensor is in correct position					
	Piping not in contact with soil/debris					
	Hoses, nozzles and breakaways not leaking or loose					
	Additional Comments:					

UST System Monthly Visual Inspection Checklist						
Facility Name: _____	Month _____	Year _____				
Facility ID: _____	Tank # _____	Type: DW _____	SW inside a liner _____		Cathodic protection _____	
UST System	Standards Checklist	Yes	No	N/A	Initials	Comments
Containment Sump	Cover in good condition					
	Clean, empty, no water, product or debris					
	Sump has no cracks or bulges					
	Sump lid and gasket in good condition					
	Piping not corroding, leaking, kinked or swelling					
	Fittings not kinked, cracked, torn, or leaking					
	Sensor in correct position					
	Sump penetrations, entry boots maintained					
	Test boot pulled back or shroud valve stem removed					
	Piping not in contact with soil					
Fill Port/Spill Bucket	Fill cover in good condition and properly color coded					
	Fill caps tightly sealed & gasket in good condition					
	Clean, empty, no water, product or debris					
	Plunger functioning properly					
	No swelling or cracks					
	Overfill protection method present					
	Overfill alarms functioning properly					
Stage-I Vapor Recovery	Drop tube in place					
	Cover in good condition and properly color coded					
	Dry break poppet cap properly sealed					
	Poppet is tightly sealed moves freely when depressed					
	Shear valves properly anchored and secure					
Dispenser	Sump clean, empty, no water, product or debris					
	Piping not corroding or leaking					
	Fittings not kinked, cracked, torn, or leaking					
	Sensor correct position					
	Piping has no leaks, not in contact with soil					
Cathodic Protection System - Impressed Current	Hoses, nozzles and breakaways not leaking or loose					
	Voltage reading within design range (value in comments)					
	AMP reading within design range (value in comments)					
Release Detection	Is the system running					
	Electronic interstitial monitoring status not in alarm					
	Visual interstitial monitoring; vacuum, stick (value in comments)					
Electronic monitoring system status check						
Additional Comments:						



This handbook is provided as a general guide. For specific regulation requirements, informational videos, FDEP/Local county contact lists and this publication in Spanish refer to the website; Esta publicación está disponible en español en la siguiente página web: <https://floridadep.gov/waste/permitting-compliance-assistance/content/storage-tank-compliance>

REMEMBER

*The State's economic engine is driven by the State's ecological engine,
so help protect our ground and drinking water by properly maintaining
your storage tank system.*



This public document was promulgated at a cost of \$2,480.00, or \$2.480 per copy,
to inform owners/operators about storage tank facilities inspections.

Revised 10/2017

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