

How to Comply with Federal and State UST Rules and Avoid Petroleum Discharges to the Environment



Mott-Smith Consulting Group, LLC





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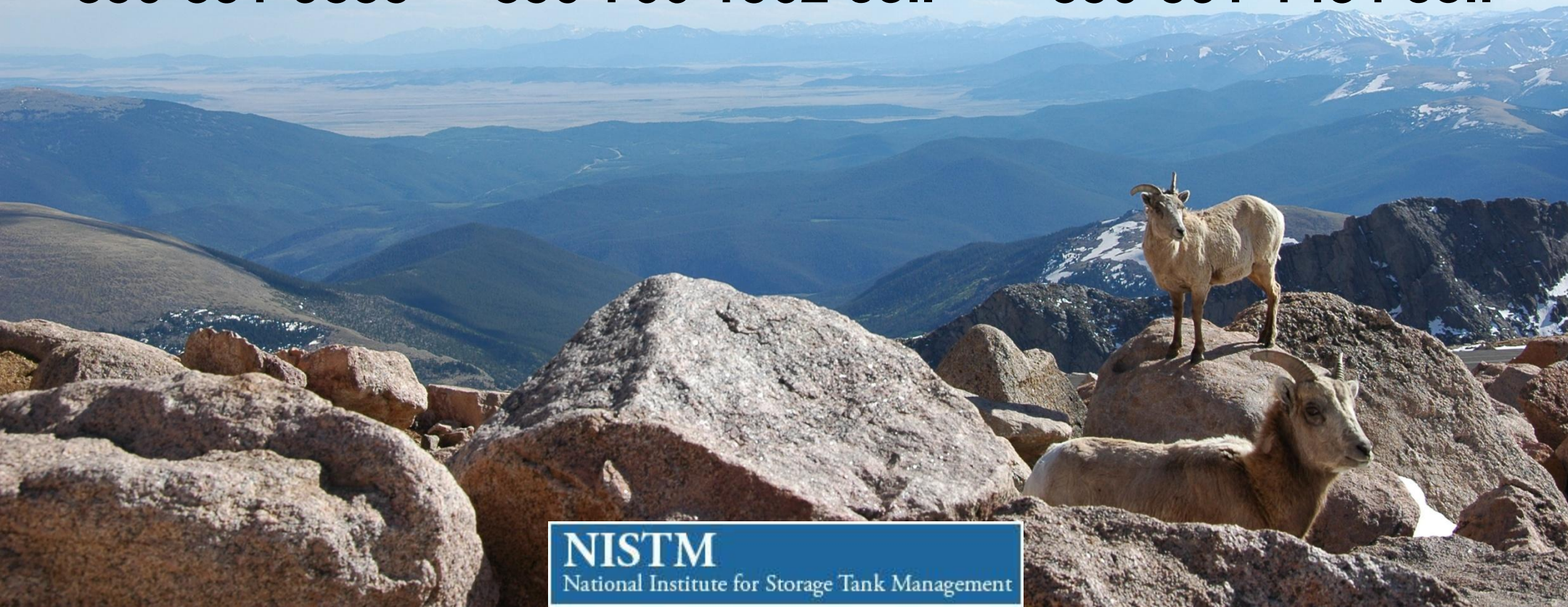
marshall@mott-smithconsulting.com

mmott-smith@aetllc.com

850-391-9835

850-766-1562 cell

850-591-1434 cell





Tanks In Missouri

Active Regulated Tanks - 10,000

Closed Tanks - 30,000

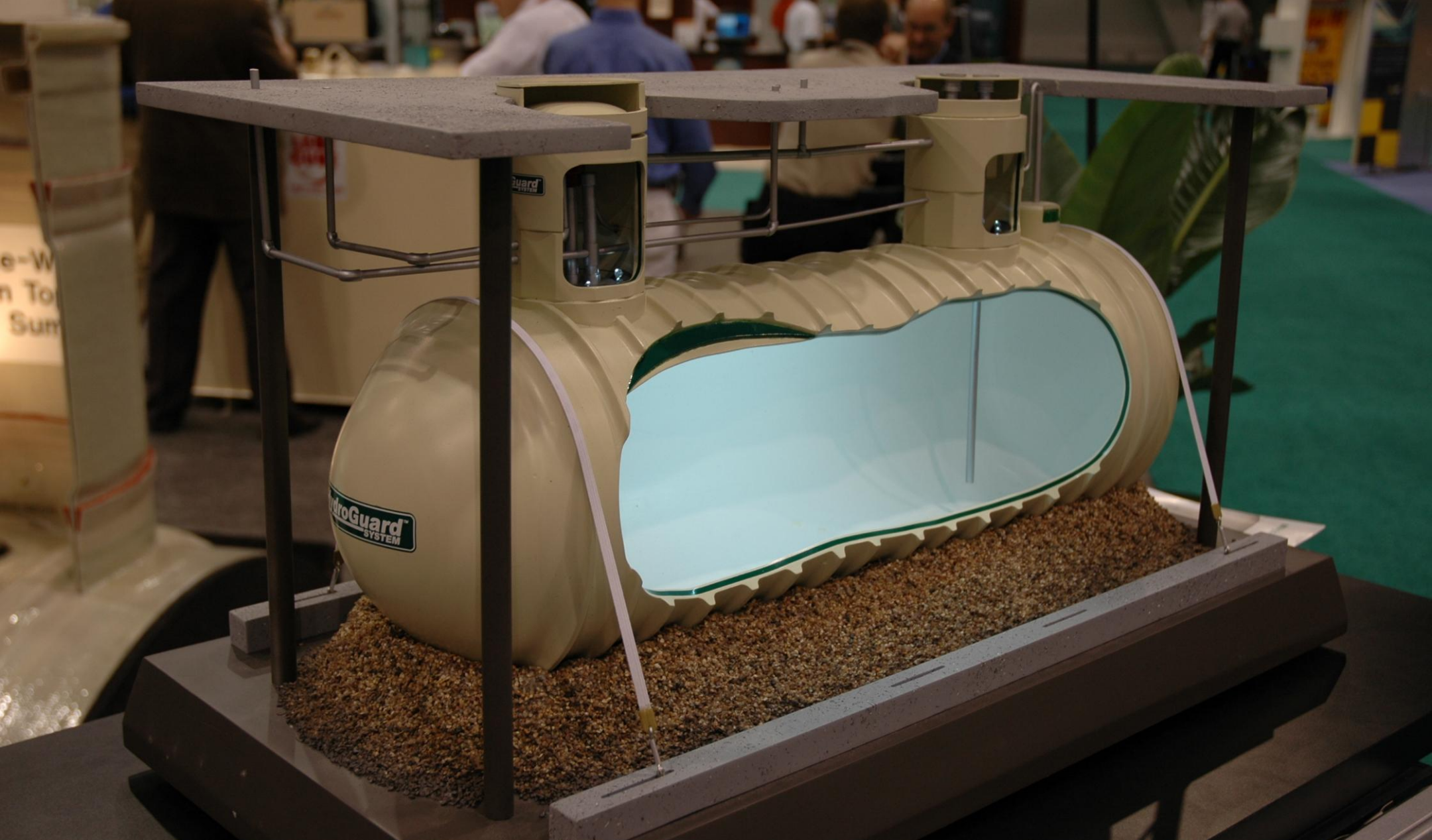
6,500 Confirmed Releases In Missouri



- All underground storage tanks over 110 gallons containing pollutants or CERCLA hazardous substances.
- Tanks must contain products that are liquids at standard temperature and pressure.

EPA & Missouri UST Applicability

A scenic landscape of snow-dotted mountains and a winding road. The foreground shows a rocky, brownish ground. A winding road with several cars is visible in the middle ground, curving through a valley. The background features large, rugged mountains with significant snow cover under a blue sky with scattered clouds.



States Regulate Storage Tank Systems



Fiberglass Reinforced Plastic

USE RELIABLE EQUIPMENT!

Underground Storage Tanks



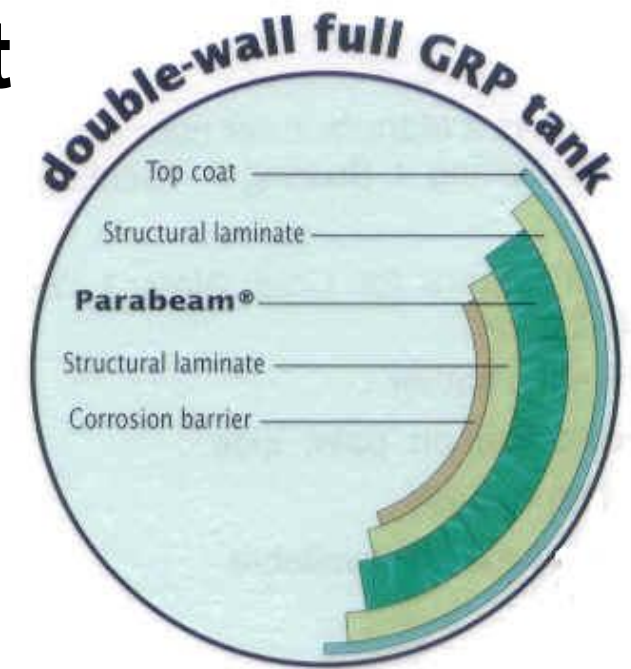
Composite

Jacketed

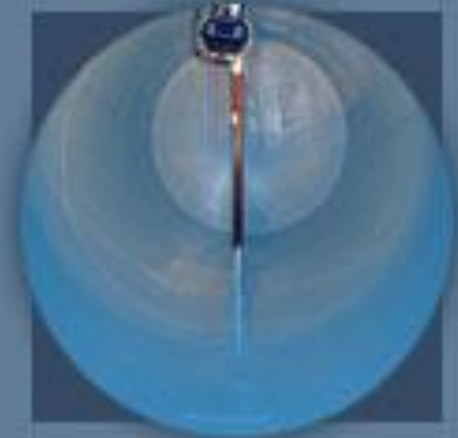


Cathodically Protected Coated Steel

Internal Secondary Containment



Tank Tech Phoenix Hybrid ZCL Phoenix System



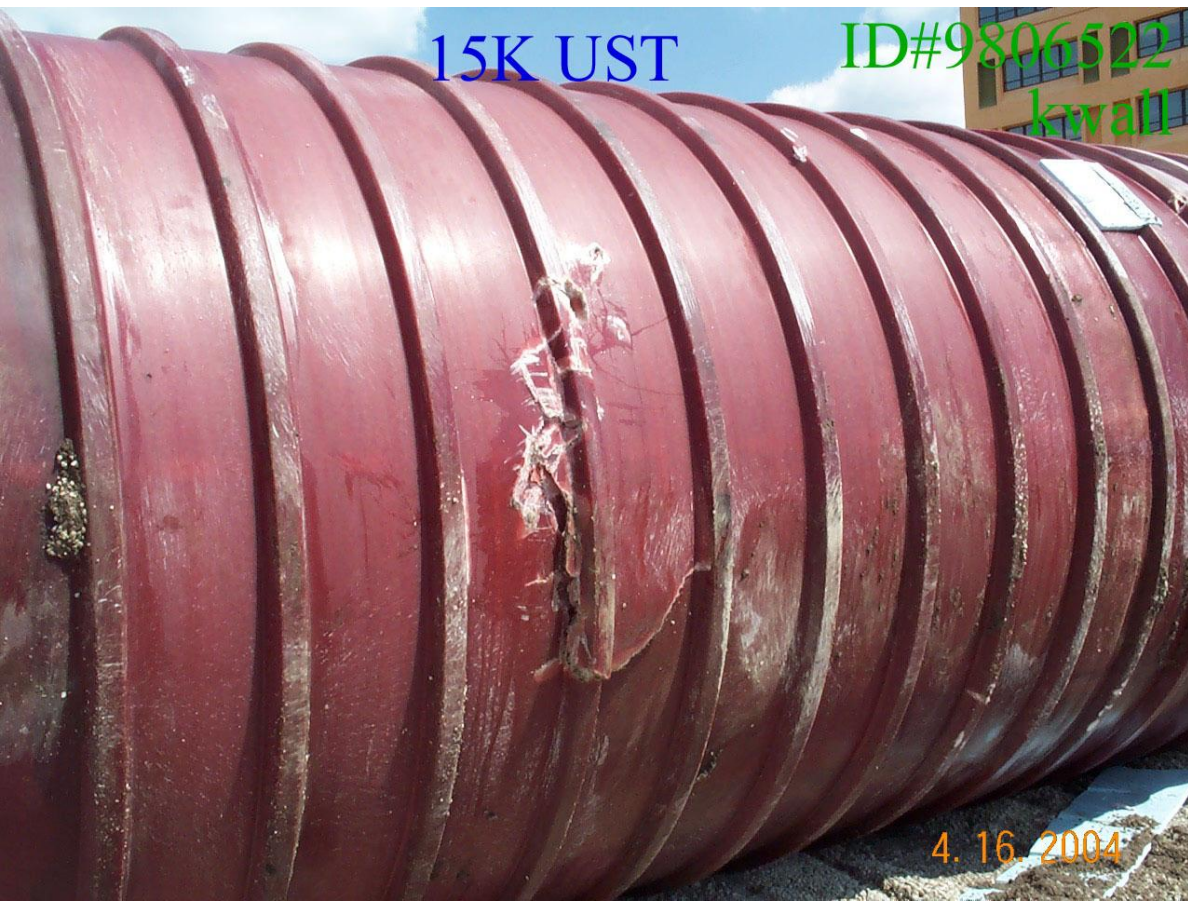
Installation



Do the job right!



How not to install a UST...



Proper UST Installation - Follow Reference Standards and Manufacturer's Instructions

Remember - State
and Local Permits



**Missouri –
One of two
states that
chose not to
require
secondary
containment
for new and
replacement
tanks**



Underground Storage Tank Recommendation...

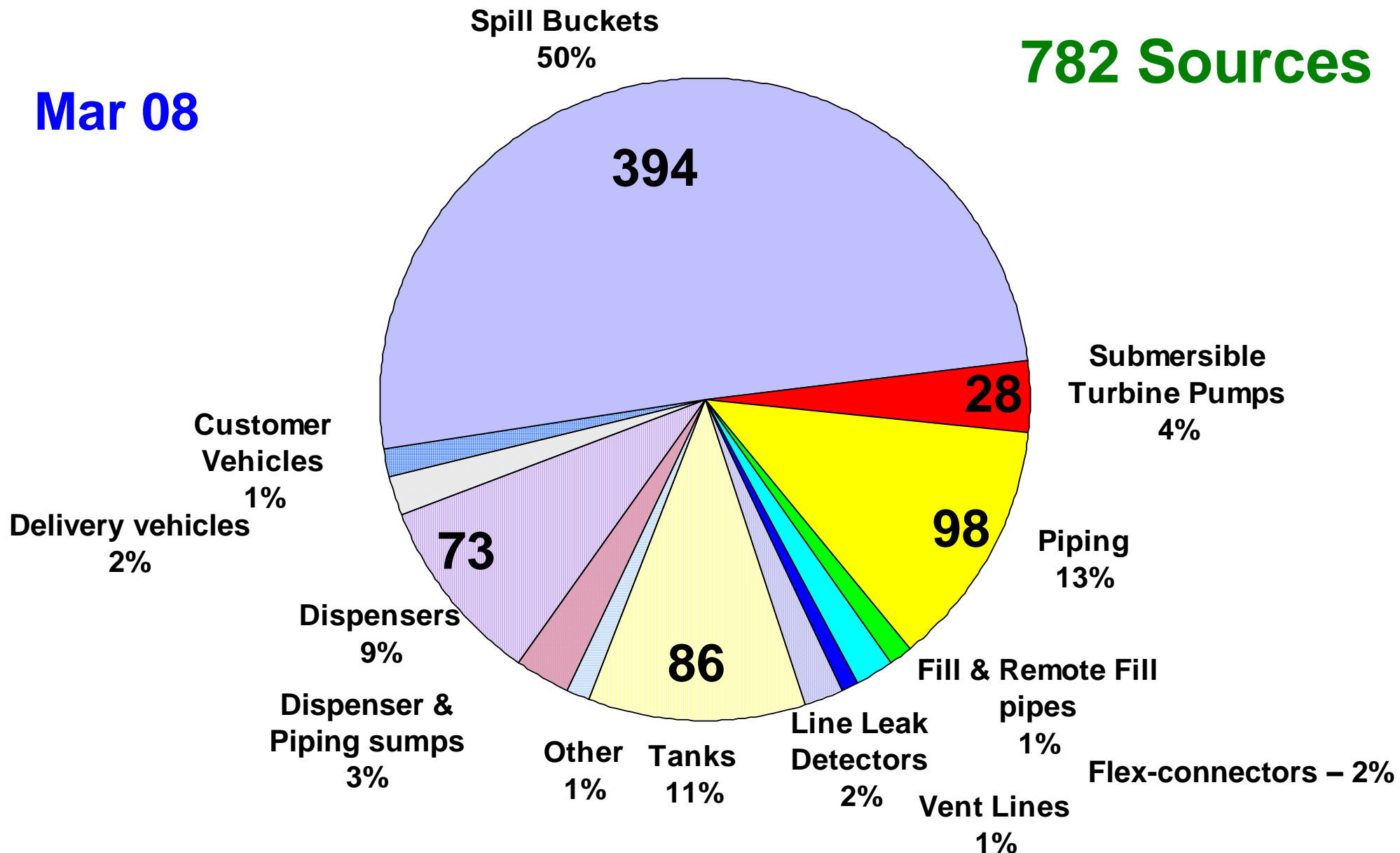


Florida Leak Autopsy Study Data shows good performance with fiberglass-coated steel and fiberglass tanks

UST Leak Sources - Florida Leak Autopsy Study

Mar 08

782 Sources





Piping

**The second
most frequent
cause of
leaks...**



Semi-rigid



Fiberglass

Small Diameter Piping with Secondary Containment



Metallic/Semi-rigid



Flexible synthetic

Installation and pre-operational testing must be in accordance with applicable industry reference standards, manufacturer's instructions, and local, state and federal rules









Fiberglass Piping



Problems as well...

Double-wall Piping with a Good Performance Record in the Florida Leak Autopsy Study*



UPP
Franklin
Fueling



Ameron



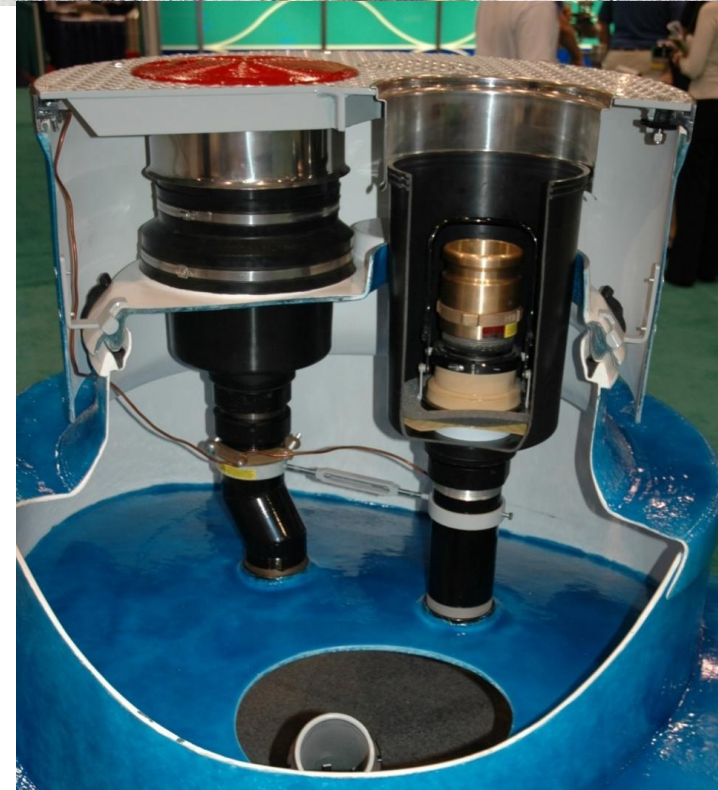
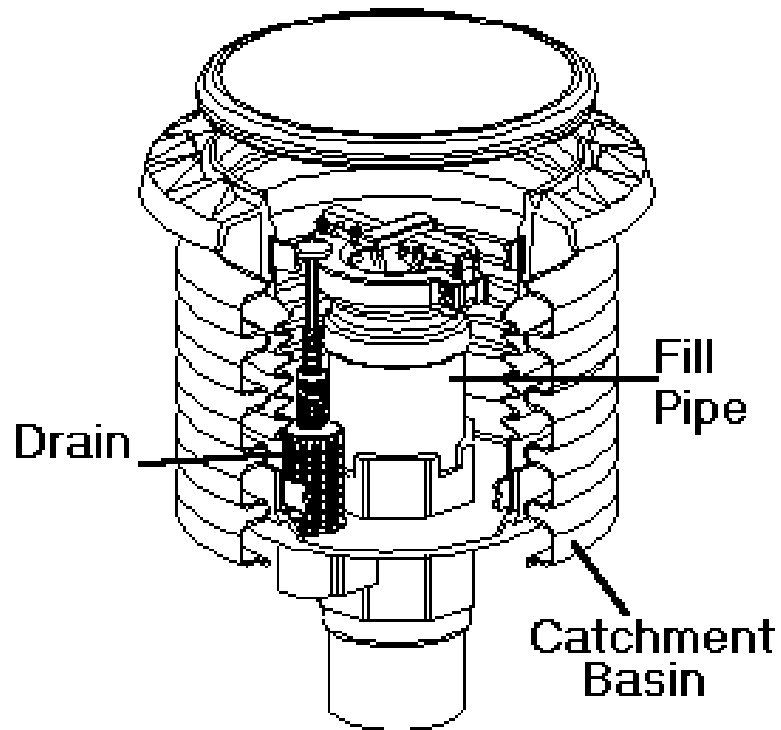
Smith



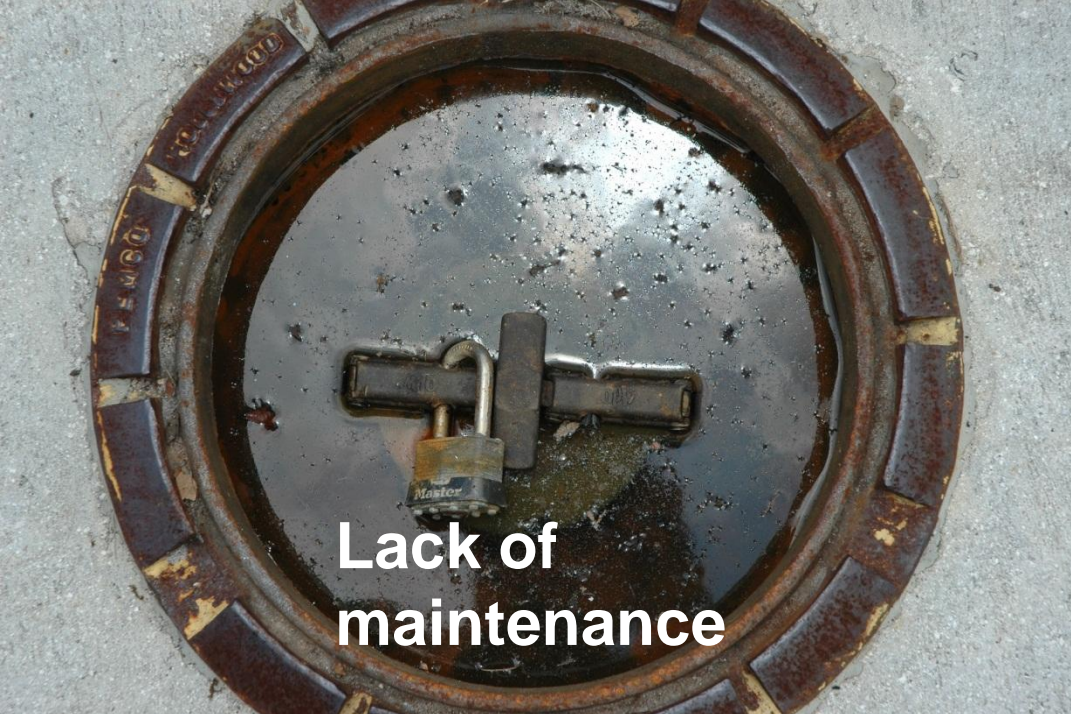
Nupi

* Not an endorsement,
not all inclusive

Spill Prevention



Problems!



Lack of maintenance

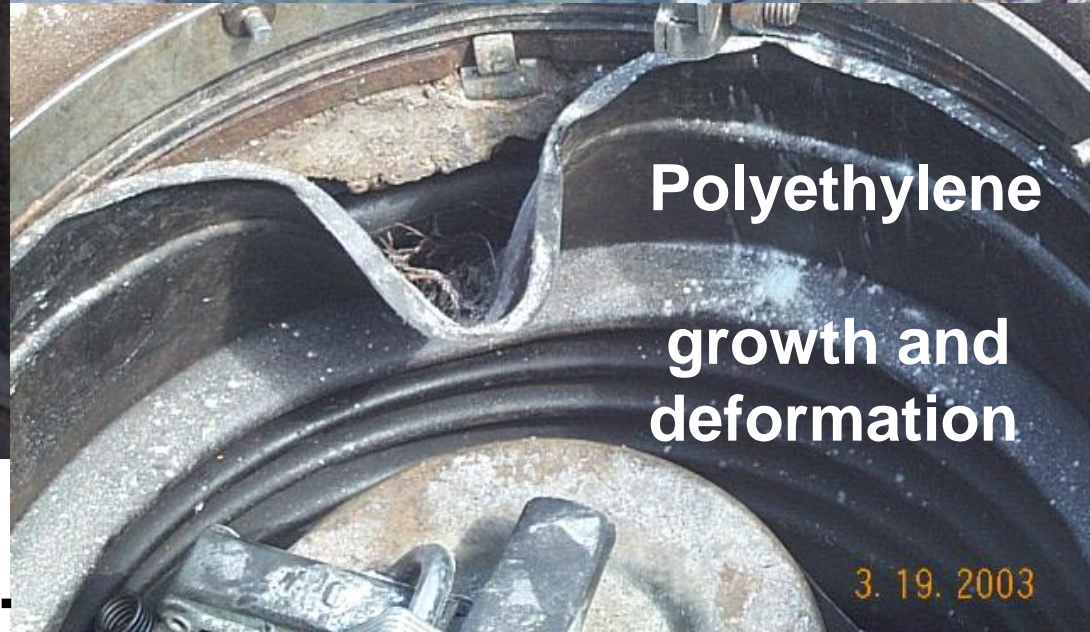


Fires

2004 12 28



Damage from drivers



Polyethylene growth and deformation

3.19.2003

Spill buckets are the most frequent source of discharges...

Recommendation for Spill Prevention...

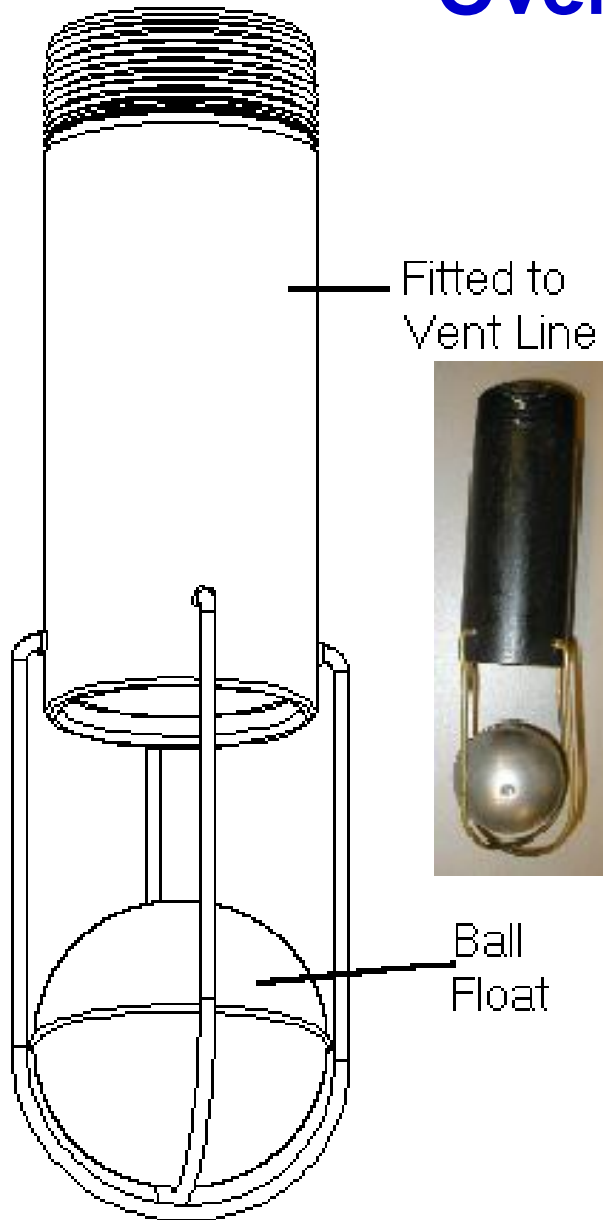
A system with a good track record – Get References!





Overfill Prevention

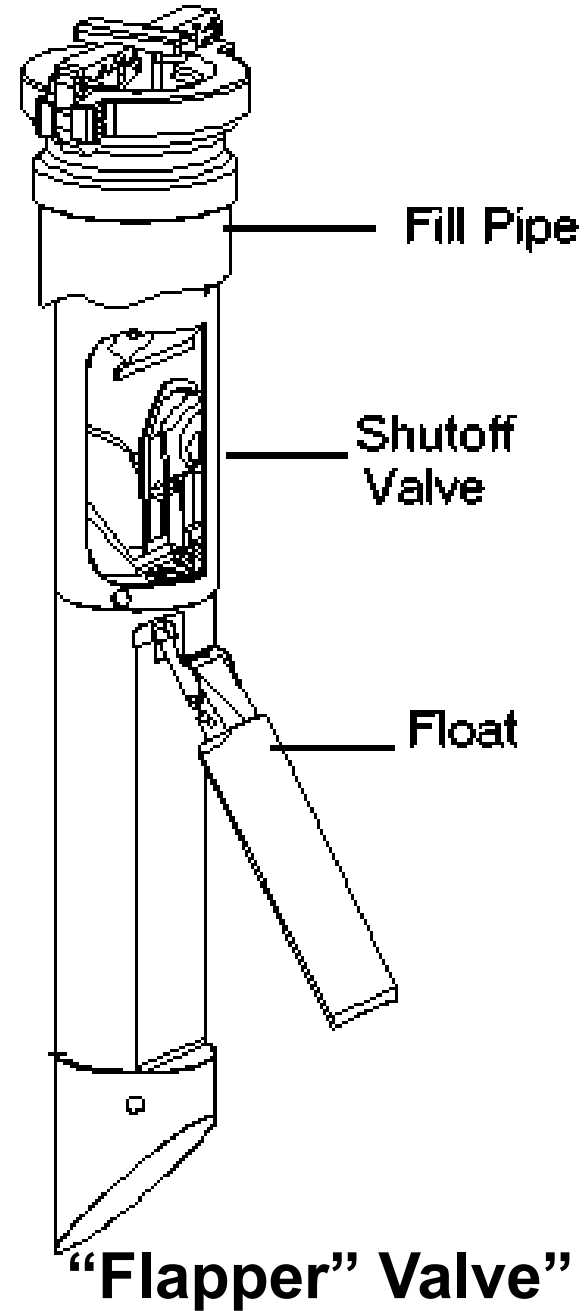
Overfill Prevention Devices



Fitted to Vent Line

Ball Float

Ball Float Valve



Fill Pipe

Shutoff Valve

Float

"Flapper" Valve



NATIONAL
WHEATON
A-1100-100-100

EMCO
WHEATON RETAIL
A1100
U.S. PATENTS 5027870, 5518024, 5887614
CITY OF NEW YORK
DEPT. OF PLANNING
APPROVAL # 4528
CZECH REPUBLIC
FT20 88 EX 0733
II 1G

FLOW



705

14 11:18 AM

Dispensers

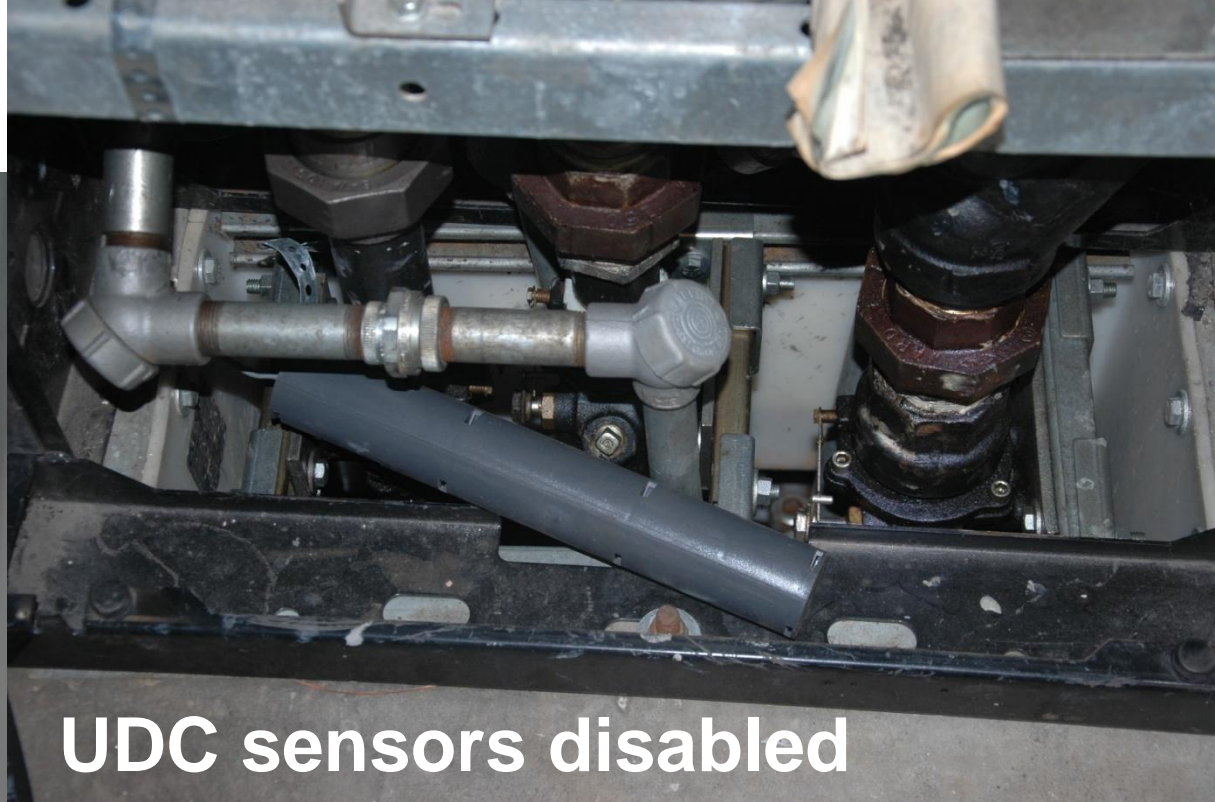


Under Dispenser
Containment

Problems!



Frayed hoses



UDC sensors disabled



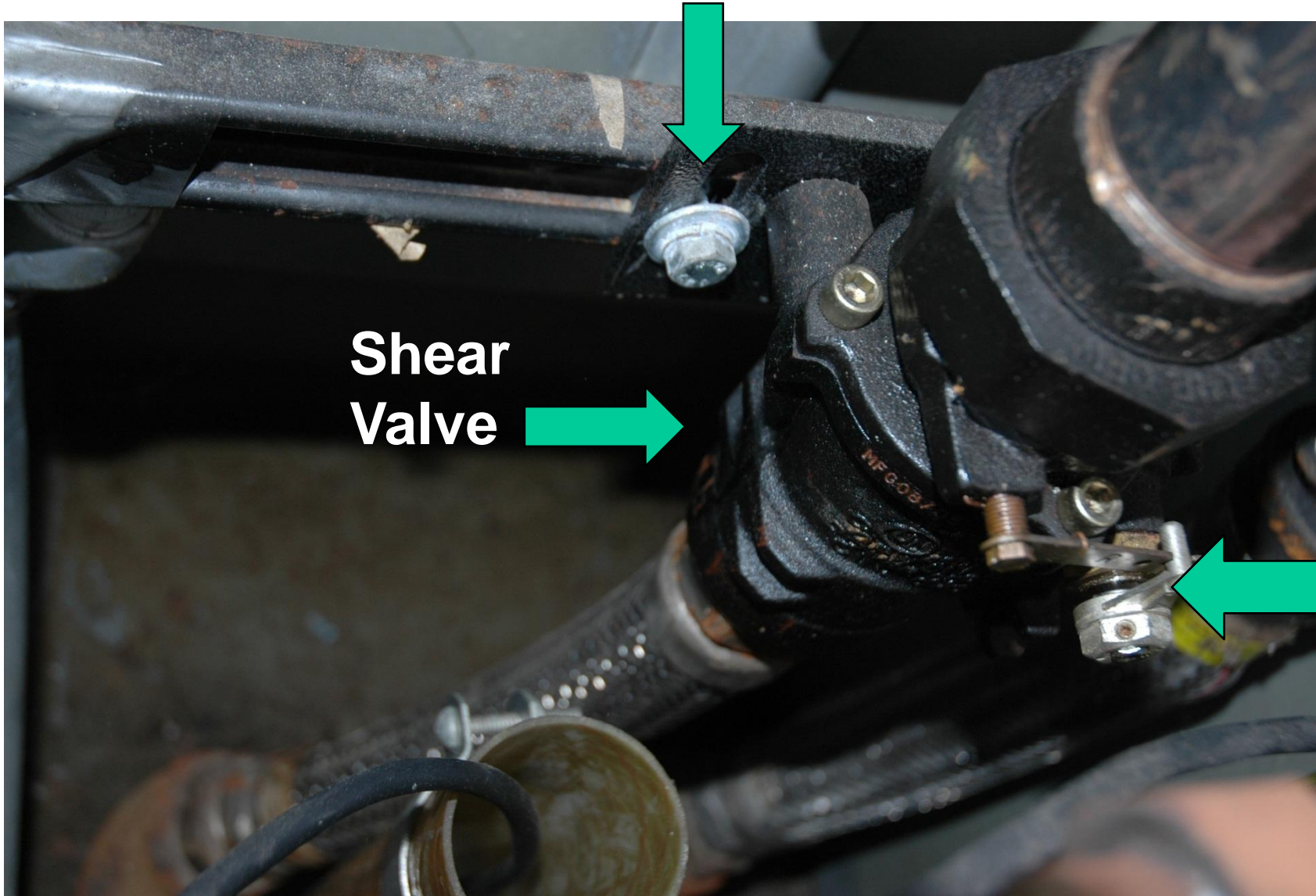
Shear Valves non-functional

Make sure the shear valve is properly anchored

**Shear
(or Impact)
Valves...**

**Shear
Valve**

**Make
sure
this
pin is
slotted
within
this
notch**



Safety Hazards...Black Widow Spiders!
**Wearing Gloves is recommended before reaching
within Dispenser Sumps**

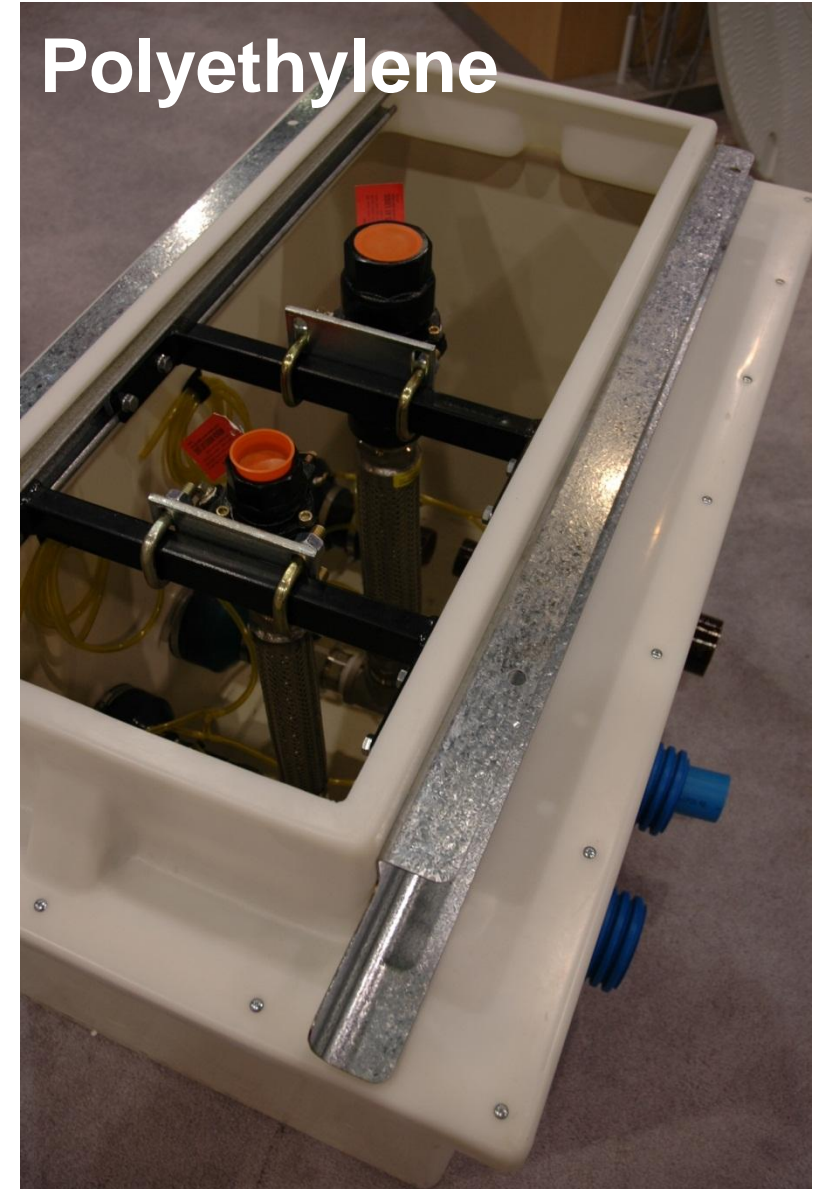
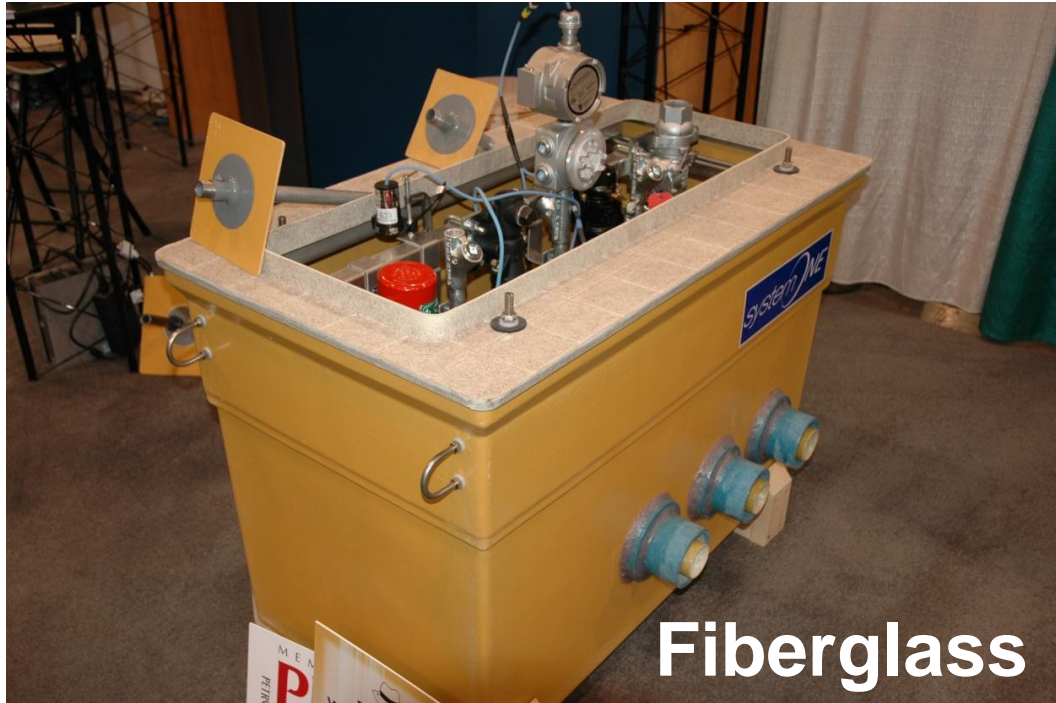


Under Dispenser Containment, UDC Sumps, or Dispenser Liners

Two main types...

Fiberglass or Polyethylene

Both have been manufactured with significant improvements in the past several years – stronger, and with better penetration fittings

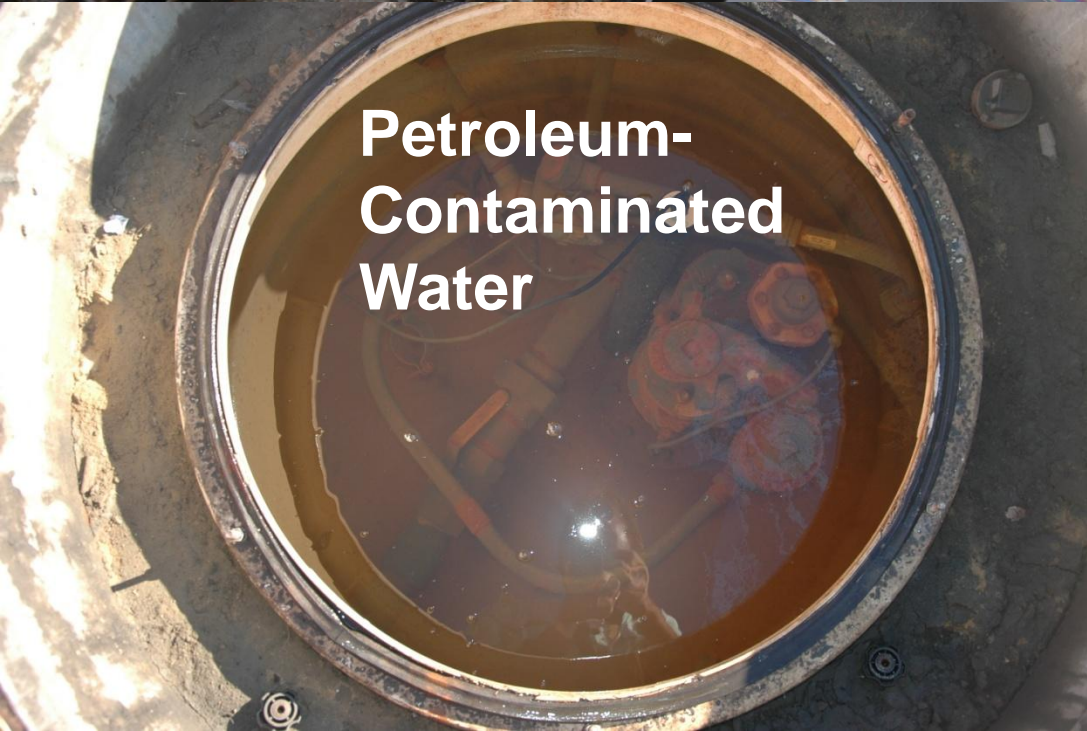




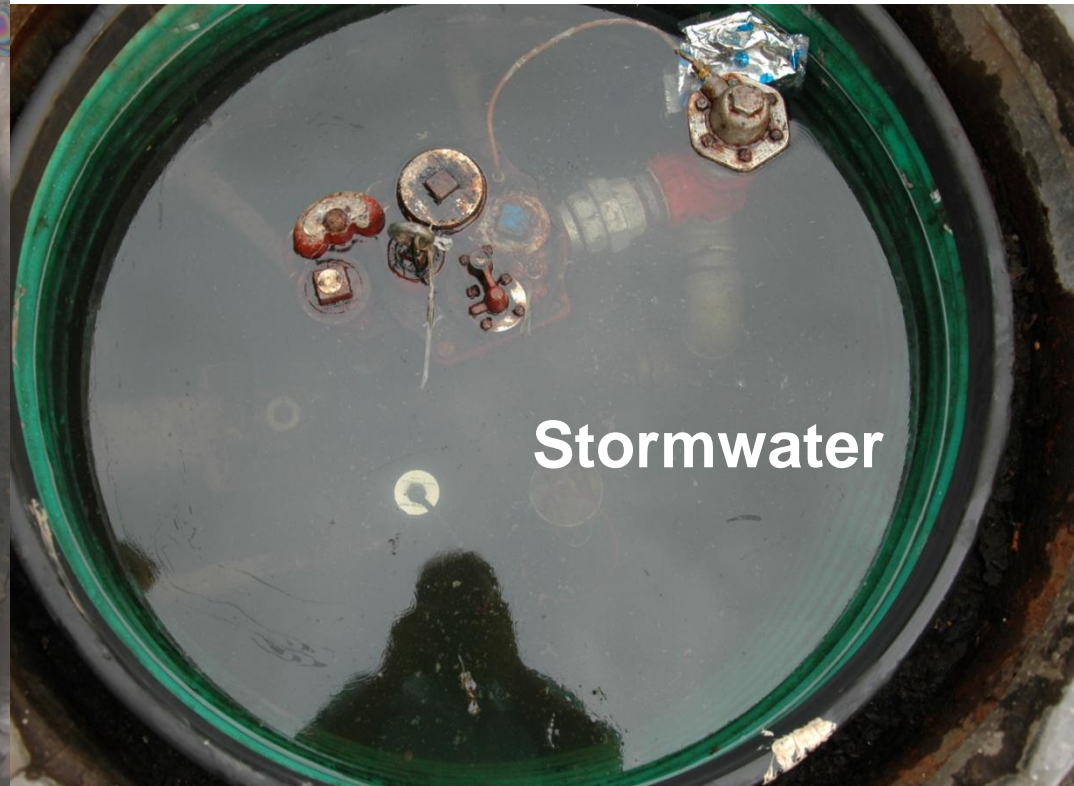
Sheen

Piping Sumps

The most frequently cited violation by State UST Inspectors – water and fuel in sumps



Petroleum-Contaminated Water



Stormwater

Piping Sumps – The Way they Ought to Look...

Dry, clean, good sump-wall penetrations, no soil build-up between sump wall collars, no rust, sensors properly positioned, gaskets in good condition.





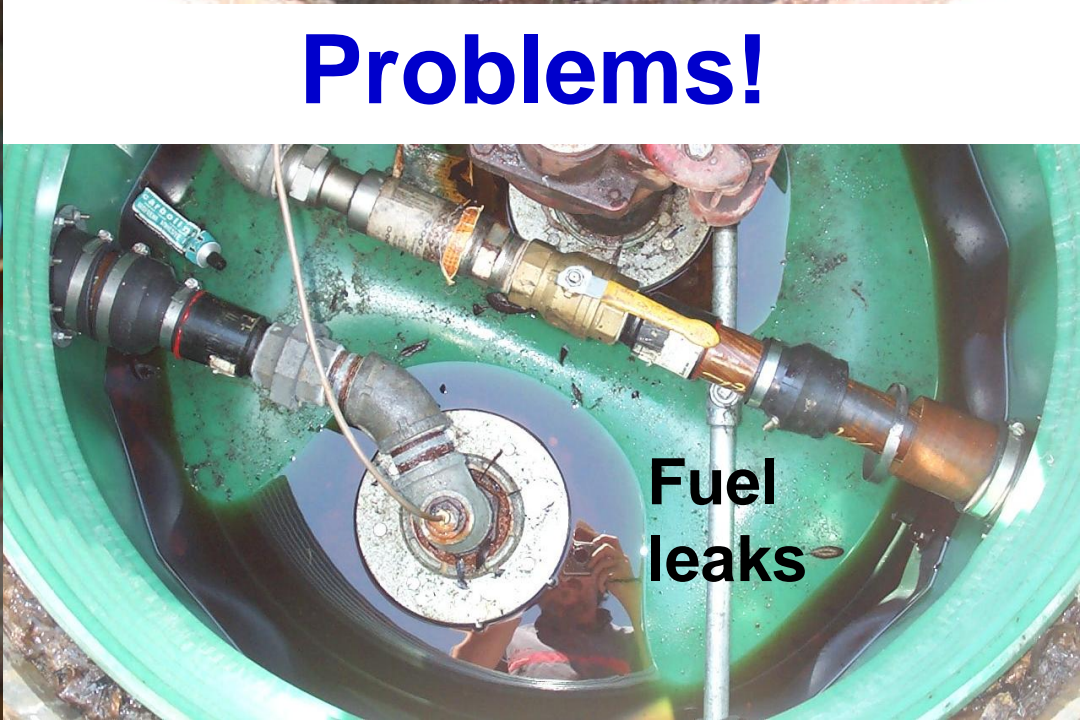
**Broken
sump
covers**



Cracks & Deformation



**Excessive
Rust**



**Fuel
leaks**

Problems!

More Problems... Dirt level build-up between the manway collar and the piping sump collar prevents proper sealing of the sump access cover

Also note the cracked concrete tank pad that has settled and allows ponding and easier ingress of stormwater



Sump Sensor Circumvention





Sump-wall penetrations and Torn Boots

These problems affect the integrity of the STP sump and could lead to a release. Repairs are required



Piping Sumps

Additional Problems



Unsealed electrical conduits



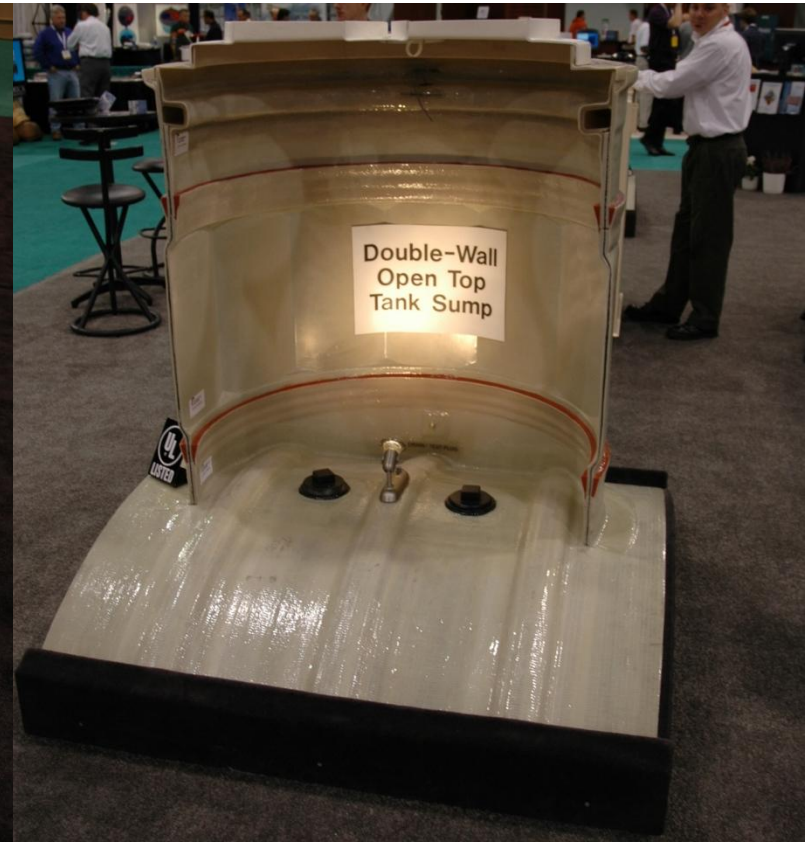
Leaking Line Leak Detectors



Damaged Flex-connectors

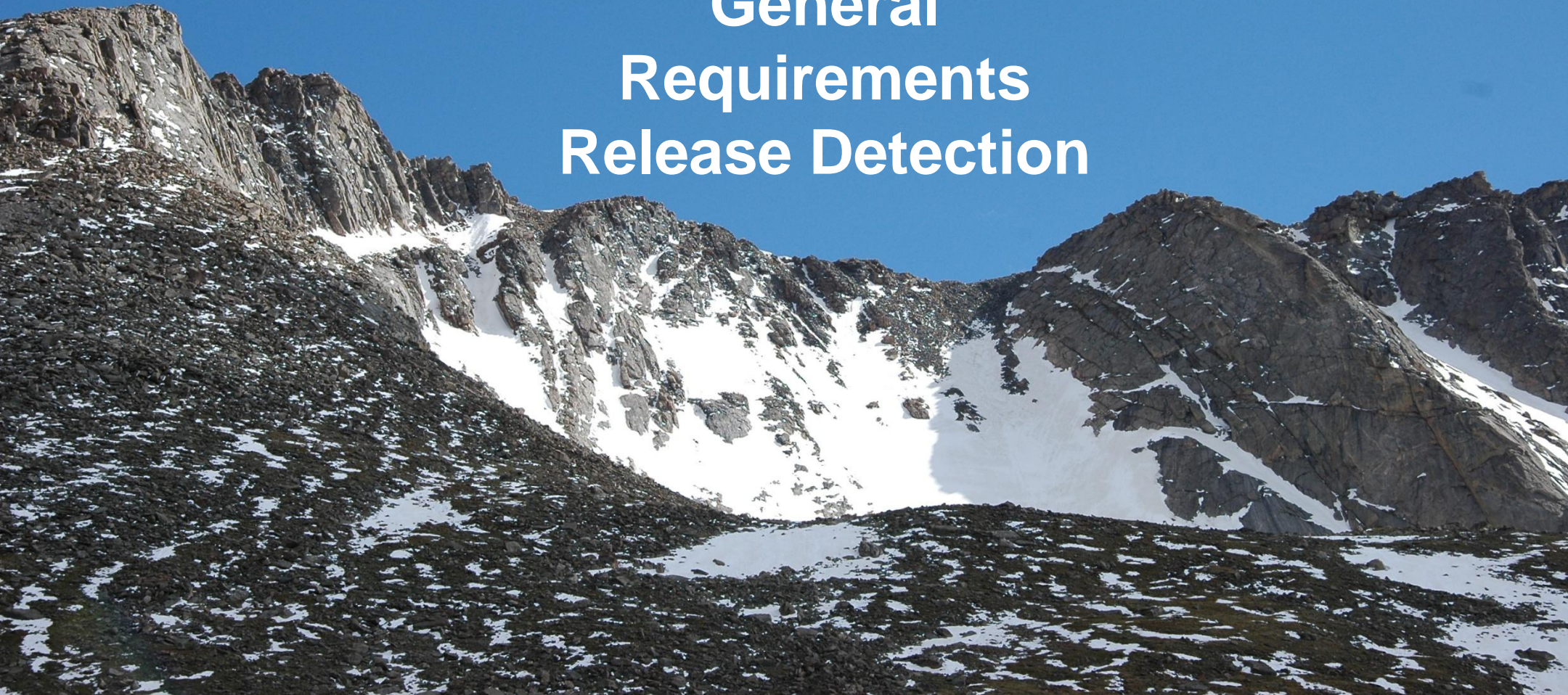
Submersible Turbine Pump Piping Sumps...

Same as for Dispensers: Fiberglass or Polyethylene
Both have been manufactured with significant improvements in the past several years – stronger, and with better penetration fittings



- You have a choice of methods for single and double-wall systems
- Release detection must be performed monthly
- Anything that can be visually inspected should be visually inspected
- Secondary containment systems must have interstitial monitoring
- You must keep records of your findings

General Requirements Release Detection



Performance Standards for Release Detection Methods

- General. Methods of release detection shall:
 - Be capable of detecting a leak of 0.2 gallons per hour or 150 gallons within 30 days with a probability of detection of 0.95, and a probability of false alarm of 0.05, with the exception of tightness testing, visual inspections, groundwater or vapor monitoring; and manual tank gauging.
 - Detect a leak from any part of the UST system, and have a third party certification/evaluation (from the NWGLDE)
 - Must be installed in accordance with manufacturers specs.

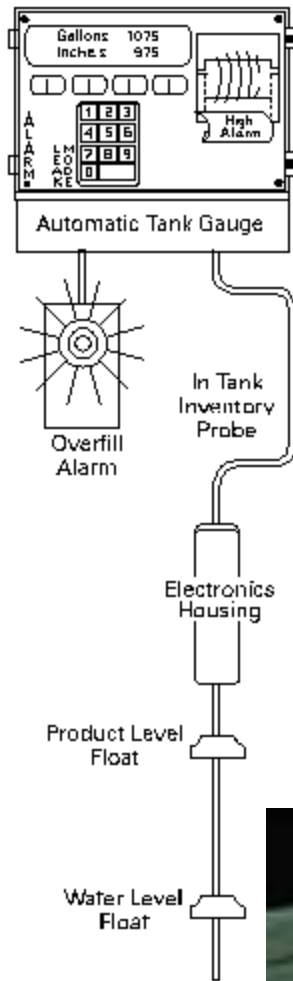
External Release Detection for Single-wall Systems

- Well construction
- Site Suitability
- Groundwater monitoring wells
- Vapor monitoring wells





Automatic Tank Gauges



Internal Release Detection for Single-wall Systems

SIR



What UST Inspectors Like to See...

APR 3, 2012 7:46:34 AM
ALL FUNCTIONS NORMAL

ALARM



WARNING



POWER



I.D

What UST Inspectors Don't Like to See...



Most ATGs have alarm history and test reports that can be printed by UST regulators. Don't think that alarms can be ignored without consequences!

Five Ways to Do Interstitial Monitoring of Double-Wall Tanks...

- Visual
- Vacuum
- Pressure
- Hydrostatic
- Sensors



Visual Monitoring of the UST Interstice

Using a Gauge Stick to look for liquids



Gauge Stick found 27" of fuel in this interstice

Vacuum Gauges — Watch for trends, refresh if necessary



Vacuum or Pressure Continuous Monitoring

SHREVE FOOD SERVICE
1336 RALEIGH RD
ROCKY MOUNT NC

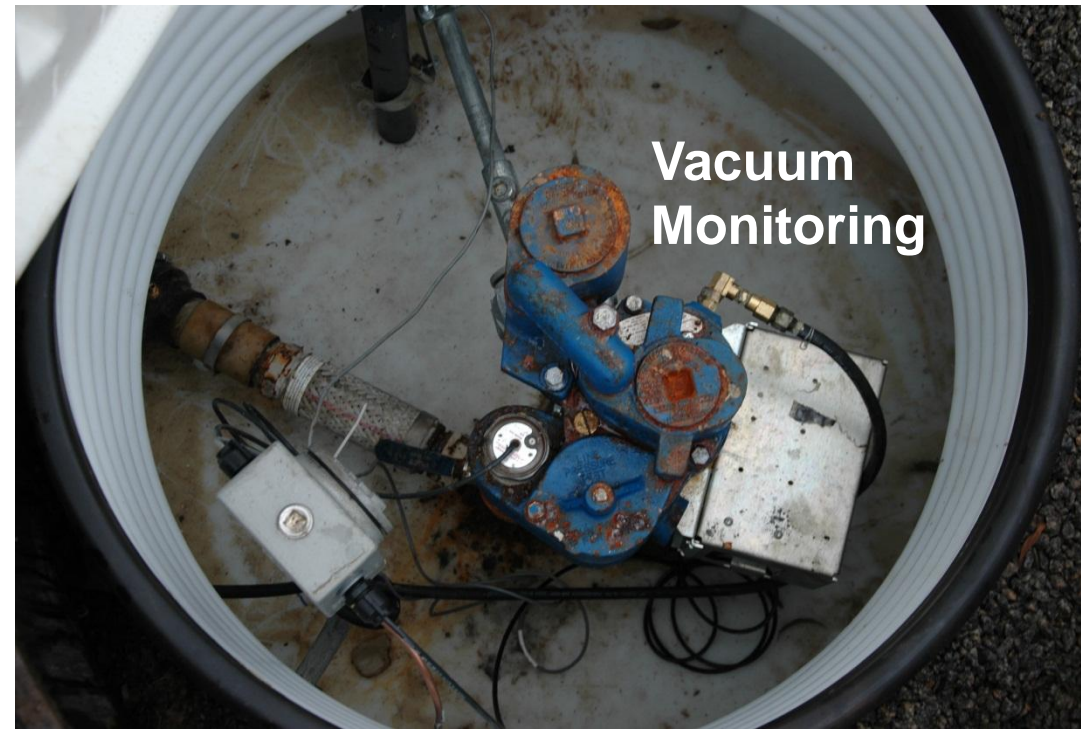
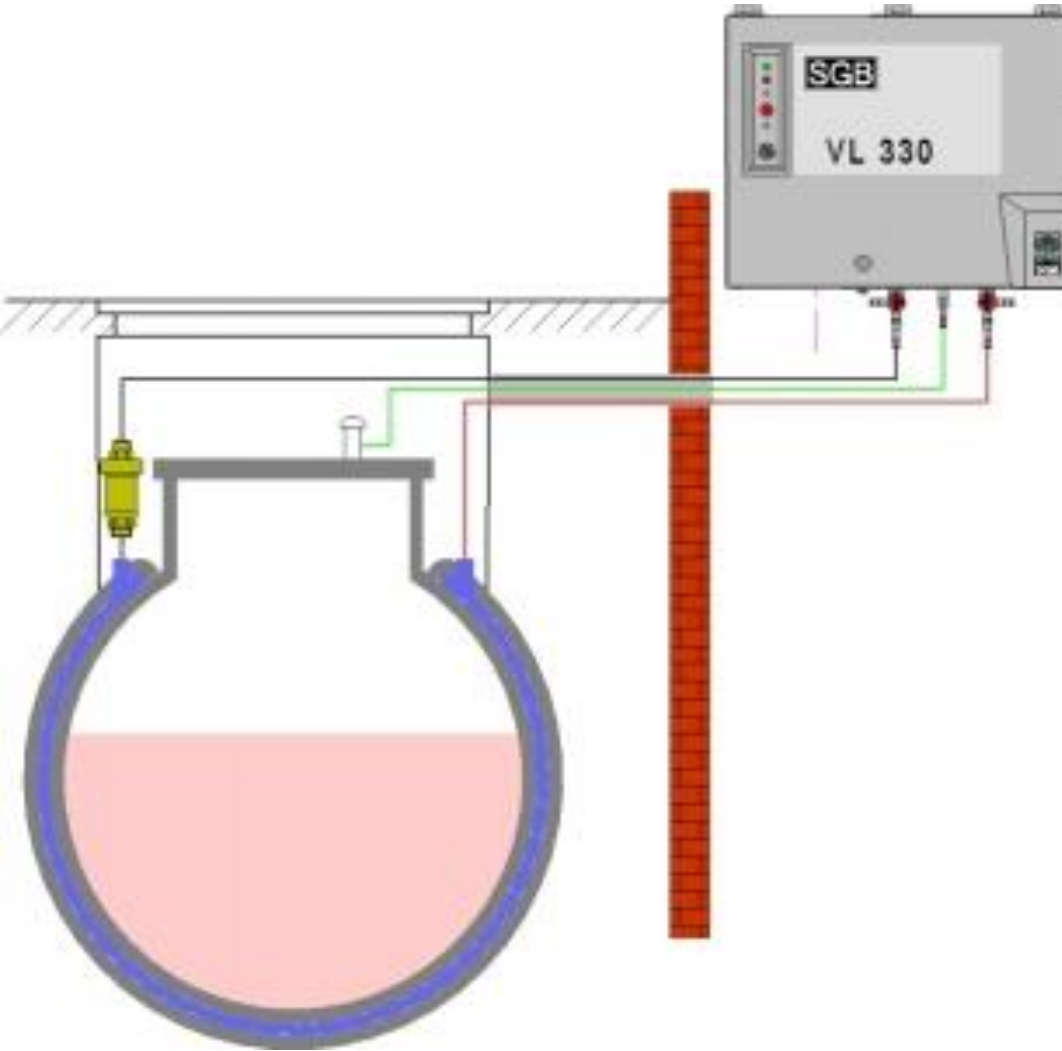
MAR 3, 2012 5:34 PM

SMART SENSOR STATUS

MAR 3, 2012 5:34 PM

s 2:VACUUM PREM
SENSOR NORMAL

← **ATG Tape with vacuum sensor status**



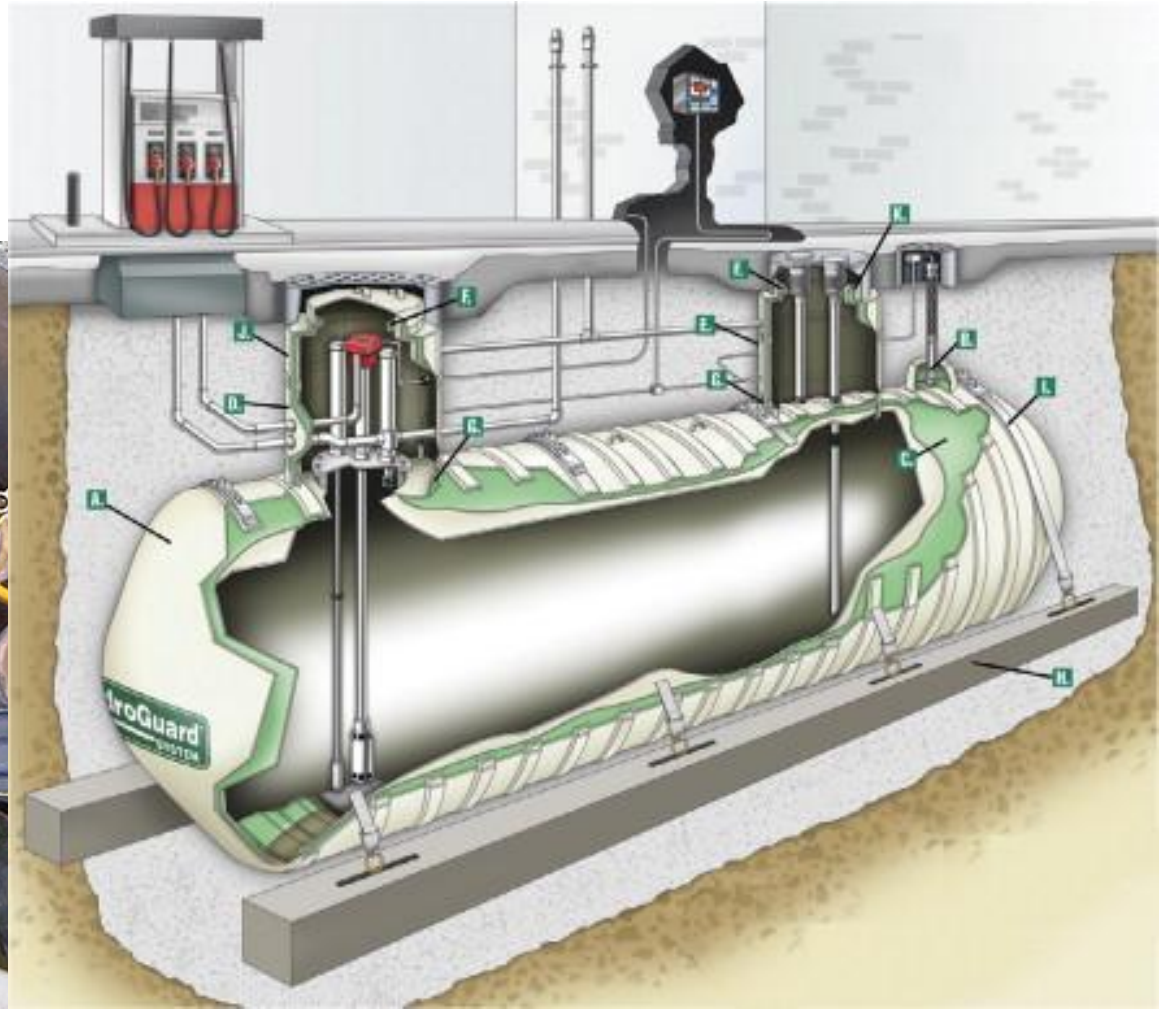
Vacuum Monitoring

Pressure monitoring not as common

Hydrostatic – Liquid Level Sensing

The interstice is liquid-filled (usually a brine solution) and monitored to determine any change in static liquid levels

Less common than sensors
or vacuum systems



Use of Sensors to Monitor the UST Interstice

One of the most common methods of interstitial UST release detection, and usually is programmed to an ATG for Alarms



Sensor extracted for service

```
06-04-12 14:40
LIQUID STATUS
-----
06-04-12 14:40

L 1:REG INTERSTICE
FUEL ALARM

L 2:PLUS INTERSTICE
SENSOR NORMAL

L 3:PREM INTERSTICE
SENSOR NORMAL

***** END *****
```


Double-Wall Piping Leak Detection



1000 NORTH AVE.
WINTER PARK, FL 32792
B0586111405001

OCT 8, 2011 1:10 PM

LIQUID STATUS

OCT 8, 2011 1:10 PM

L 1:RUL STP SUMP
SENSOR NORMAL

35

L 2:PUL STP SUMP
SENSOR NORMAL

L 3:RUL FILL SUMP
SENSOR NORMAL

L 4:PUL FILL SUMP
SENSOR NORMAL

L 5:RUL ANNULAR
SENSOR NORMAL

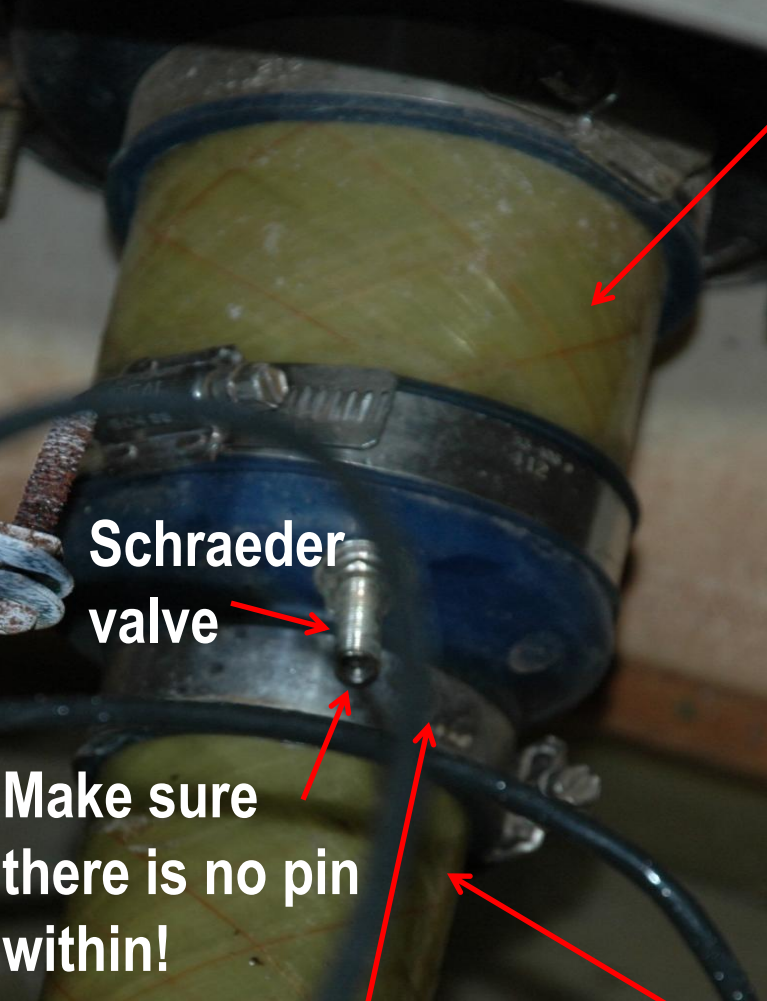
L 6:PUL ANNULAR
SENSOR NORMAL

L 7:DISP 1-2
SENSOR NORMAL

L 8:DISP 3-4
SENSOR NORMAL

* * * * * END * * * * *

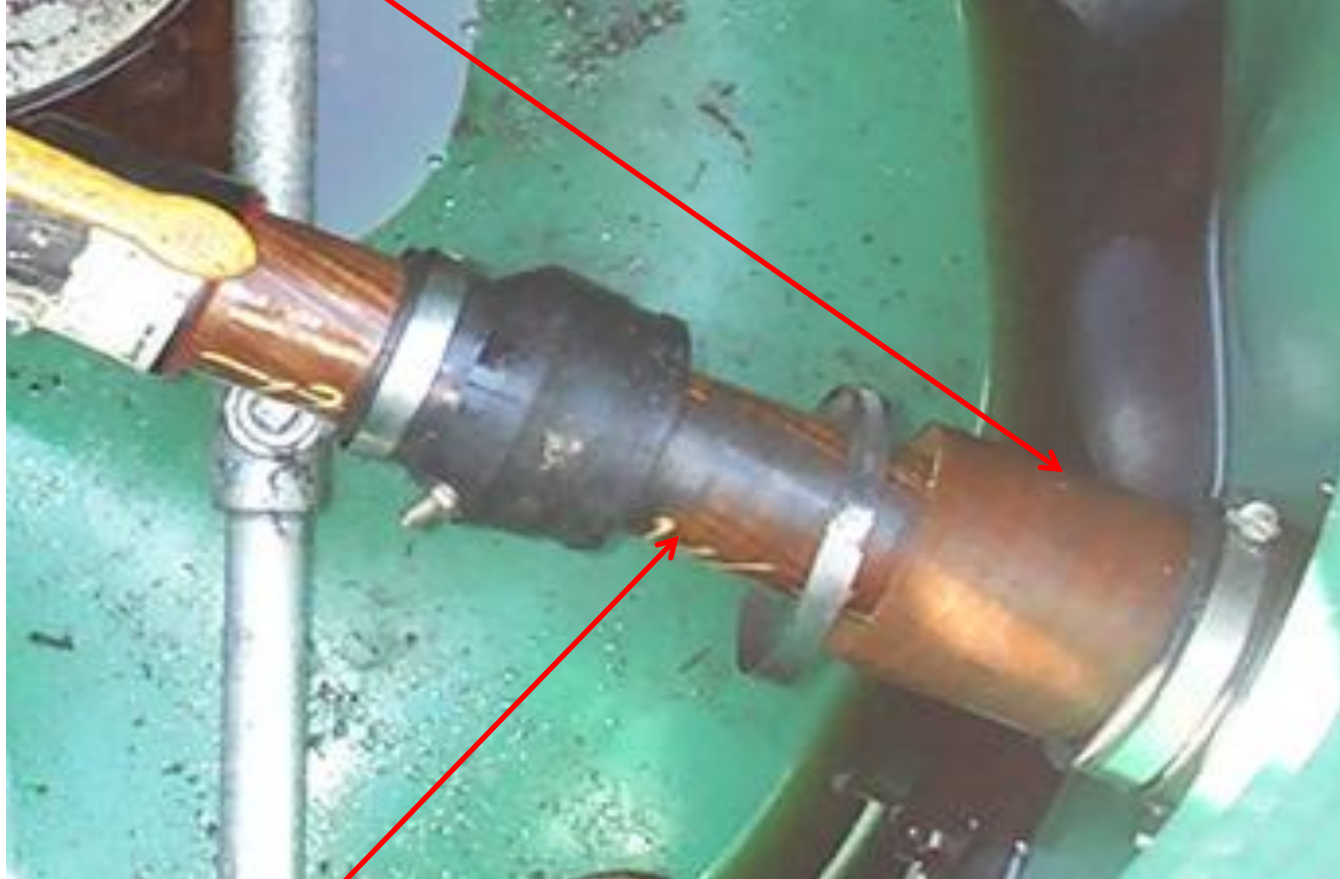
Outer-wall Piping Leak Detection



Schraeder valve

Make sure there is no pin within!

Tight band clamp, no way for product to enter the sump unless the schraeder valve is open

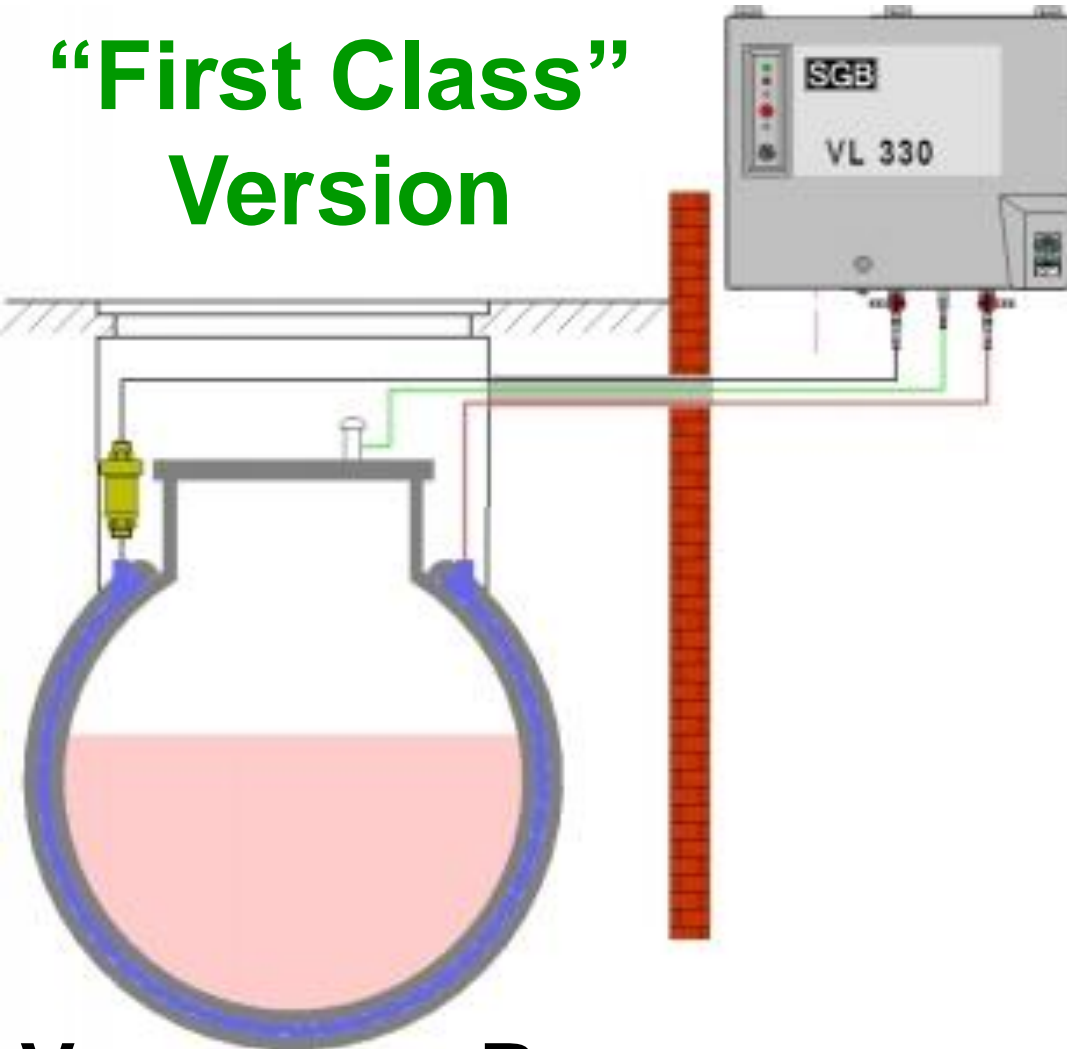


Inner-wall

Band clamp loose, free pathway for fuel to enter sump as shown

Recommendation for Release Detection...

**“First Class”
Version**



**Vacuum or Pressure
Continuous Monitoring**

**The “Economy”
Version**



Visual Inspections!

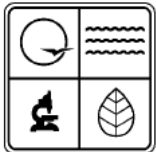
Notification – Regulatory Authorities must be given a written notice:

- Before installation or upgrading
- Before internal inspections or closure
- Update Notification or Registration Form for change of ownership, closure, upgrading, facility info, including financial responsibility



Registration

- Owners must register with the State, usually before regulated substances are put into the system.
- Fees - \$15/year/tank



MISSOURI DEPARTMENT OF NATURAL RESOURCES
HAZARDOUS WASTE PROGRAM
UNDERGROUND PETROLEUM STORAGE TANK REGISTRATION

FACILITY ID NUMBER ST
AGENCY USE ONLY
OWNER NUMBER
DATA ENTRY BY
DATE

Return completed form to:
Missouri Department of Natural Resources
Hazardous Waste Program – Tanks Section
P.O. Box 176
Jefferson City, Mo 65102

Note to owners/operators: An instruction page is attached to assist you in completing the form. Use additional sheets for sites with more than five tanks and re-number the top column.

OWNER INFORMATION

TANK OWNER NAME (CORPORATION, INDIVIDUAL, AGENCY, ETC)

ADDRESS

TELEPHONE NUMBER WITH AREA CODE

CITY

STATE

ZIP CODE

COUNTY

Financial Responsibility

- EPA Requirement.
- One million dollars coverage required for petroleum marketers (cleanup and third party liability).
- \$500,000 coverage required for non-marketers.
- Use FR Allowable Mechanisms - Letter of Credit, Surety Bond, Insurance, etc.
- Only for petroleum storage systems. State & Federal facilities are exempt



Repairs

- Hire qualified and state certified contractors with good references

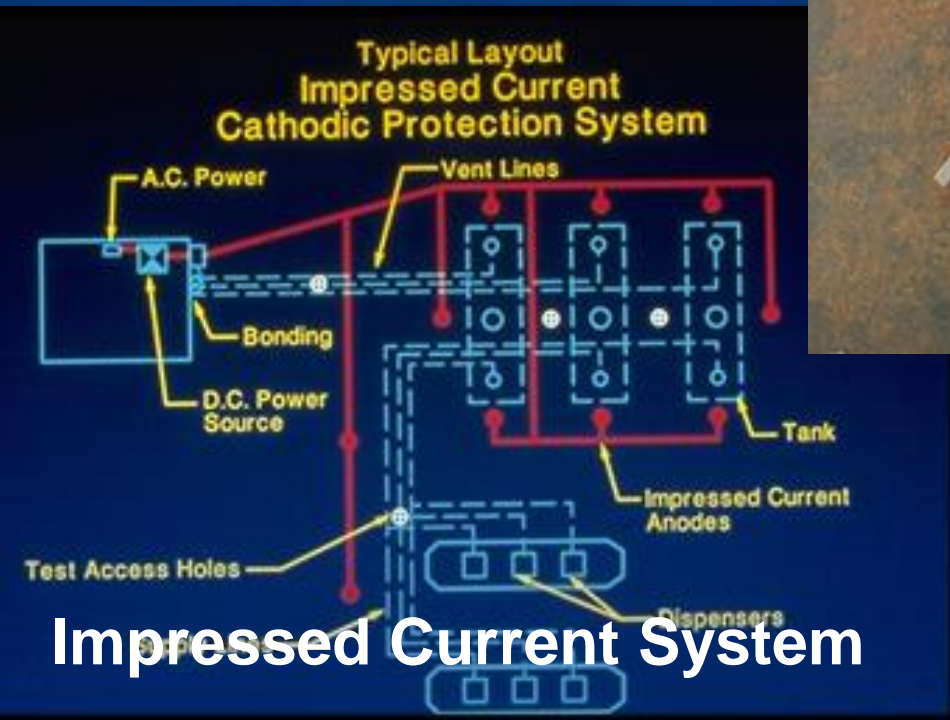


ID#9806522
16K UST
kwall

Cathodic Protection for Steel Systems



Sacrificial Anode System

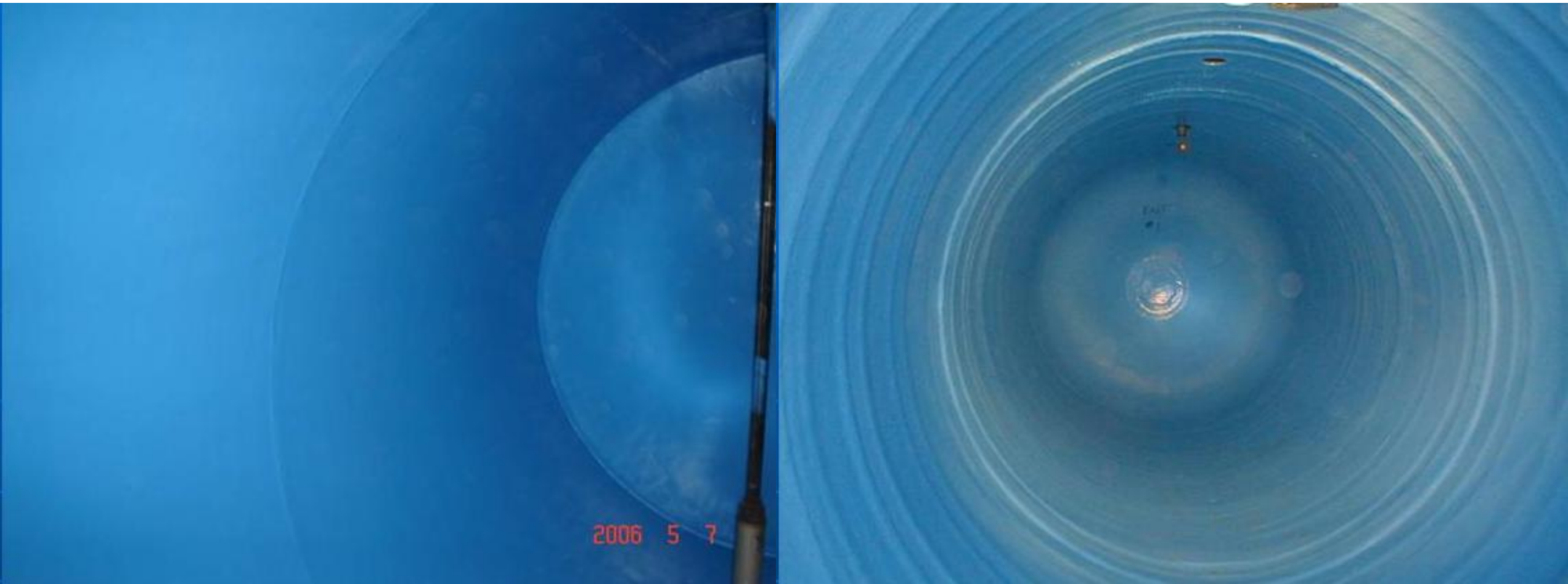


Impressed Current System

Sampling equipment



Internal Lining by reputable companies with new ethanol-compatible coatings



Operation and Maintenance



Mission Critical...

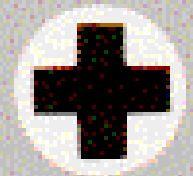
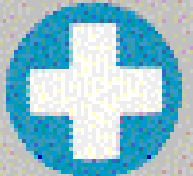
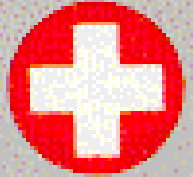


Maintaining Equipment



Painting
Fill-box
Covers

Unleaded



Performing tests



Removing Petroleum Contact Water



Changing filters



Removing dirt around sump collars

Operation and Maintenance

Checking hoses



Cleaning debris from sumps



VALERO 406
2829 OKEECHOBEE RD.
FT. PIERCE, FL 34947
772-882-4984

JAN 26, 2012 12:06 PM

LIQUID STATUS

JAN 26, 2012 12:06 PM

L 1:REGULAR ANNULAR
SENSOR NORMAL

L 2:PLUS ANNULAR
SENSOR NORMAL

L 3:PREMIUM ANNULAR
SENSOR NORMAL

L 4:REGULAR STP SUMP
SENSOR NORMAL

L 5:PLUS STP SUMP
SENSOR NORMAL

L 6:PREMIUM STP SUMP
SENSOR NORMAL

* * * * * END * * * * *

Record Keeping

Most records kept for two years, others for the life of the system



Recordkeeping

- Keep a spiral notebook of visual inspections
- Keep a tabbed notebook of all other records required by the State
- Photo-document if possible
- Keep Registration Information up-to-date



Out of Service and Closure



**Out-of-Service...
time limits &
assessment rules**

Tanks must be empty!

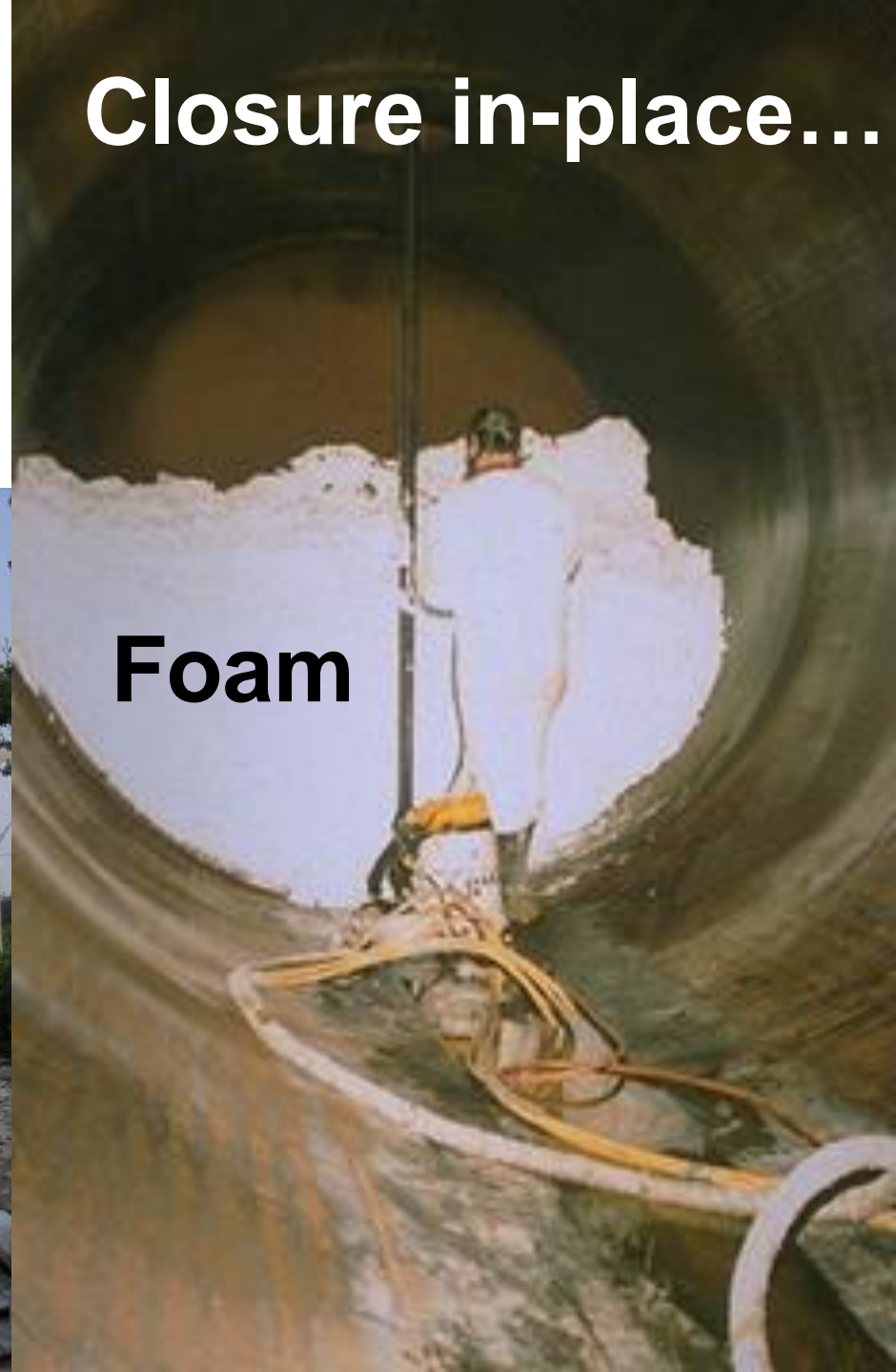


Closure

**Two Choices – Removal,
or Closure-in-place**



Closure in-place...



Foam

Closure in Place

Care must be taken...





Closure and Installation usually must be performed by State-qualified or State-certified contractors. Be sure to hire a contractor with the right certification.

9502503 - Taylor's BP Food Mart #2
Moldenhauer
dbi wall steel

Inerting



Sludge removal



Disposal



UST Closure

Closure – Care must be taken during removal to prevent discharges. If you have a problem, photo-document the problem and keep a material sample of the system if possible.





**Don't be a victim of
Natural Selection...**



SAFETY FIRST!

Permanent Closure Closure Assessments

Before permanent closure or a change-in-service is completed, owner/operators must measure for the presence of a release where contamination is most likely to be present at the UST site according to State procedures.



Incident and Discharge Reporting

Incidents



Discharges

Discharge/Release Response – Complete Discharge Report Form within 24 hours or the close of the next business day – control and abate the discharge



Other Inspections



**Fire Safety Inspections by
the Local Fire Marshal**



**Weights and Measures
Inspections**

The End

