

UST Inspector Training 101

September 25, 2014

Spruce C. Wheelock

NH DES, UST/AST Inspector

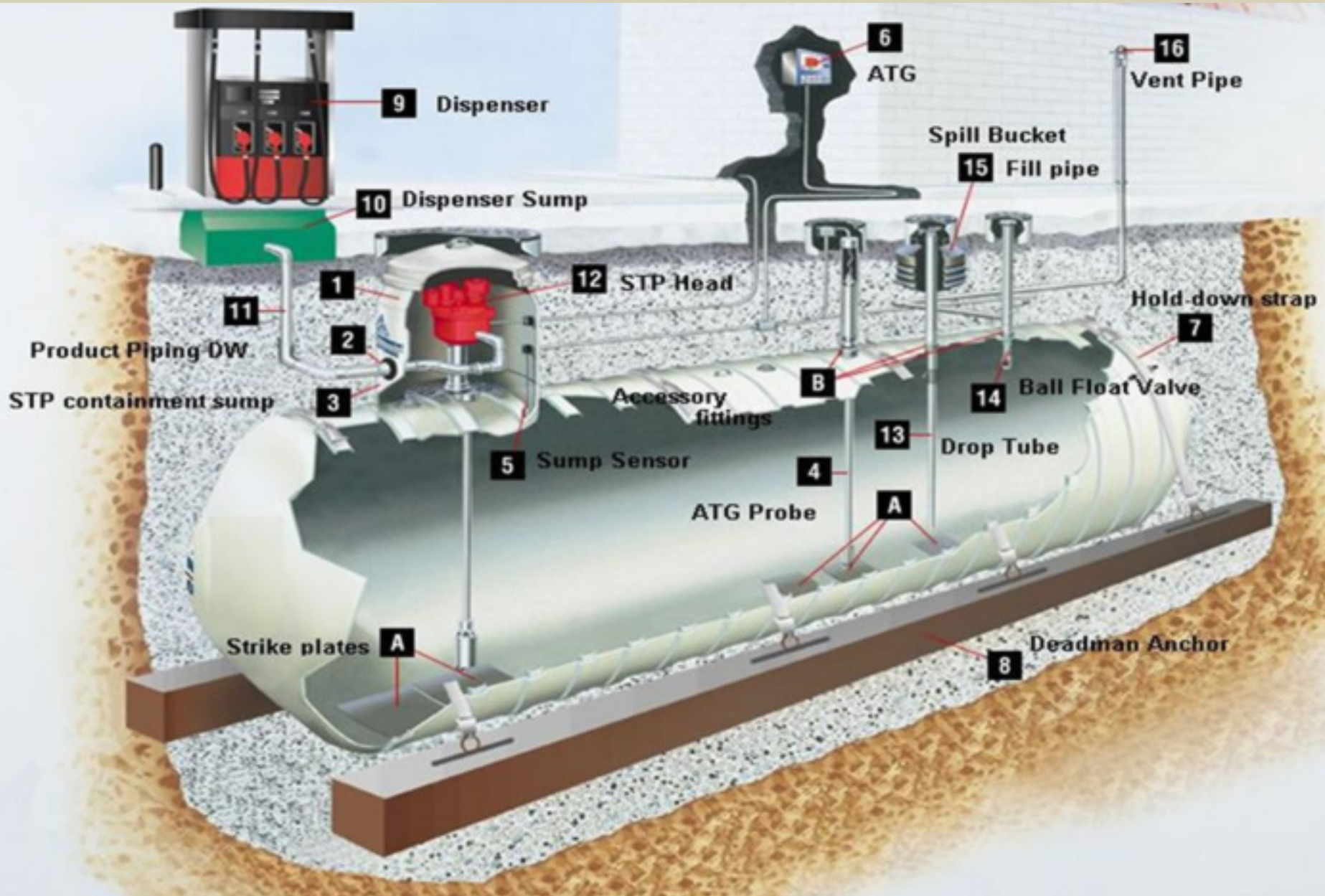
Inspections 101 webinar



CONTENT

Equipment in the following areas

- Release detection & Leak monitoring
- Spill protection
- Overfill protection
- Corrosion protection



Release Detection

Single Wall (SW) Tank and Piping



Monitoring Well



Release Detection SW Tank

Automatic Tank Gauge (ATG)

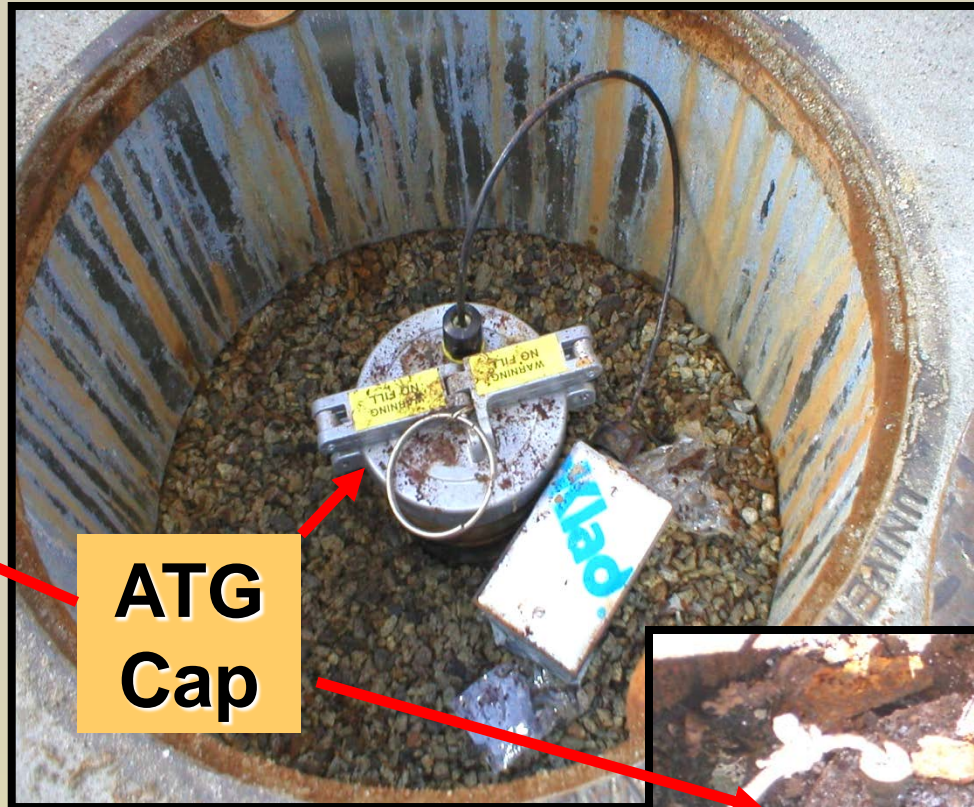


In Tank
Inventory
Probe



Product float

Water float




**ATG
Cap**



Release Detection SW Tank ATG Requirements

- Daily tightness test
- Every 30 days
 - one passing test
- CSLD
 - Continuous statistical leak detection

 **Annual Automatic Tank Gauge (ATG) Test Form For Underground Storage Tank Systems without Secondary Containment**

*For use in the State of New Hampshire
N.H. Code of Administrative Rules 1001:000-0001 (1-01-2005)*

The New Hampshire Department of Environmental Services (NHDES) has developed this form to help you document the required annual testing of the ATG equipment at this underground storage facility. Consult manufacturer's requirements on testing for specific guidelines.

Facility Name: _____ NHDES Facility ID#: _____
Facility Address: _____ City: _____ Zip: _____

A. Results of ATG Test
Complete the following checklist using: Y=yes, N=no, N/A=not applicable
If your answer is No, or Fail then describe on the reverse side of this form how and when these items will be corrected.

1. ATG manufacturer's name and model number: _____

| | Tank #: | | | | | | | | |
|-----|---|------|------|--|--|--|--|--|--|
| 2. | ATG programmed for the specific tank size. | | | | | | | | |
| 3. | ATG operates daily in leak detection mode. | | | | | | | | |
| 4. | ATG capable of detecting a minimum of 0.2 gallons per hour leak rate. | | | | | | | | |
| 5. | ATG programmed for manufacturer's minimum capacity for accurate testing. | | | | | | | | |
| 6. | ATG program for proper duration of testing time. | | | | | | | | |
| 7. | ATG was visually inspected, manually tested, confirmed operational and reset. | | | | | | | | |
| 8. | The ATG console audible alarm is confirmed operational and reset. | | | | | | | | |
| 9. | The ATG console visuals (e.g., readout, alarm, warning, and power lights) are confirmed operational and reset. | | | | | | | | |
| 10. | The communication equipment (e.g., modem) is operational for release detection systems and will relay alarms to a remote station. | | | | | | | | |
| 11. | In summary, the ATG is confirmed to be in proper operation per manufacturer's requirements. | Pass | Fail | | | | | | |

B. Verification
I hereby verify that the automatic tank gauging system was tested to conform with Env-Win 1401.29(1) and the equipment identified in this report is operating according to the originally designed function. Attached to this form is information (if available, system set-up reports) necessary to verify that this information is correct.

Technician Name (print): _____ Testing Company Name: _____
Testing Co. Address / State / Zip: _____
Tester's Signature: _____ Phone No. () _____ Test Date: _____

C. General Instructions

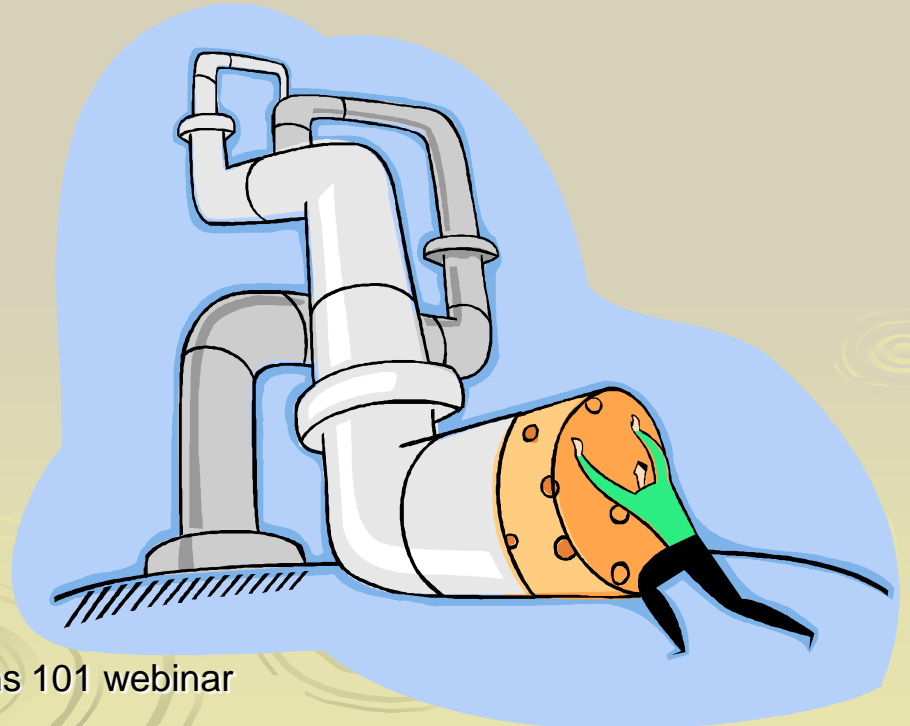
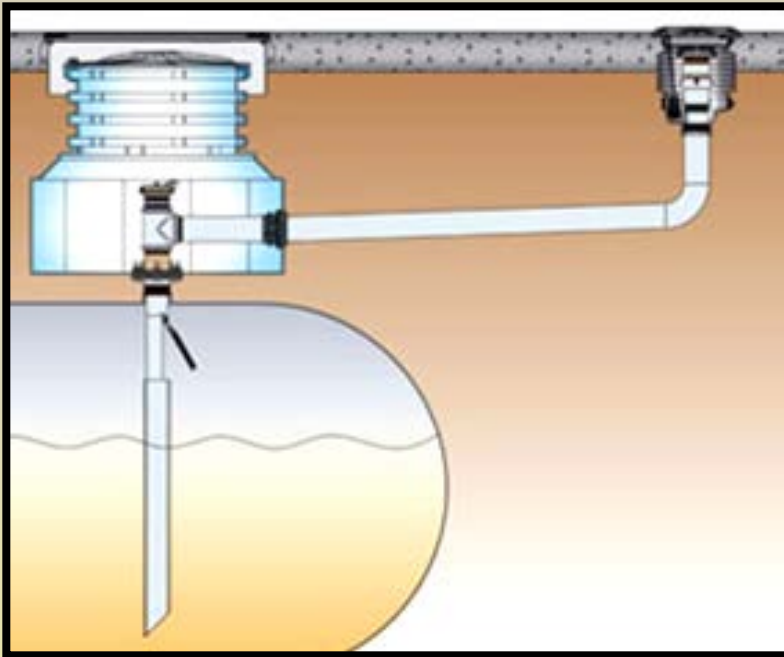
1. Keep a completed copy of this form for owner/operator records.
2. The owner/operator must submit a copy of this ATG test results to NHDES within 30 days of the test.

Mailing Address:
STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
OIL REMEDIATION AND COMPLIANCE BUREAU
PO BOX 95
CONCORD NH 03302-0095
Phone # (603) 271-3644 Fax # (603) 271-2181

Release Detection

SW Piping

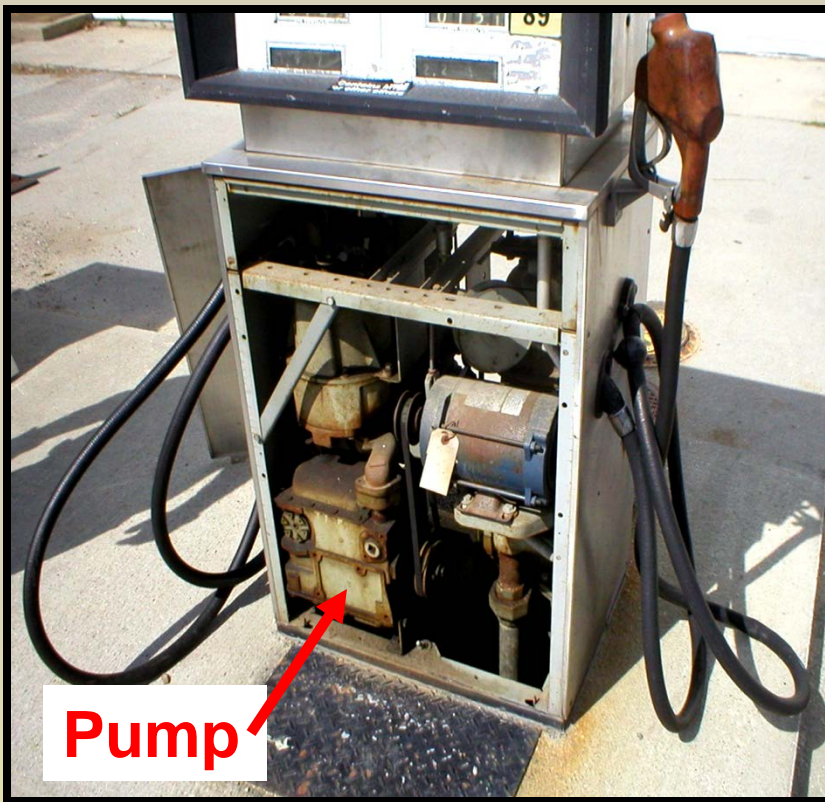
- Piping system:
- Suction
 - Pressurized
 - Remote fill (pressurized)



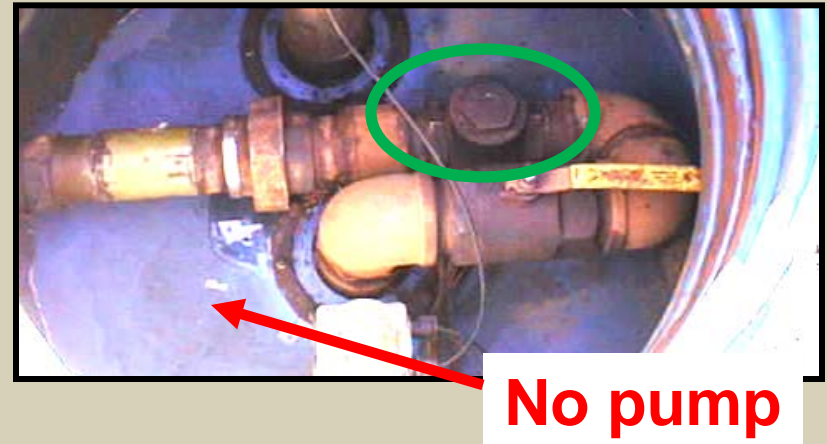
Release Detection

SW Suction Piping

Dispenser Pump



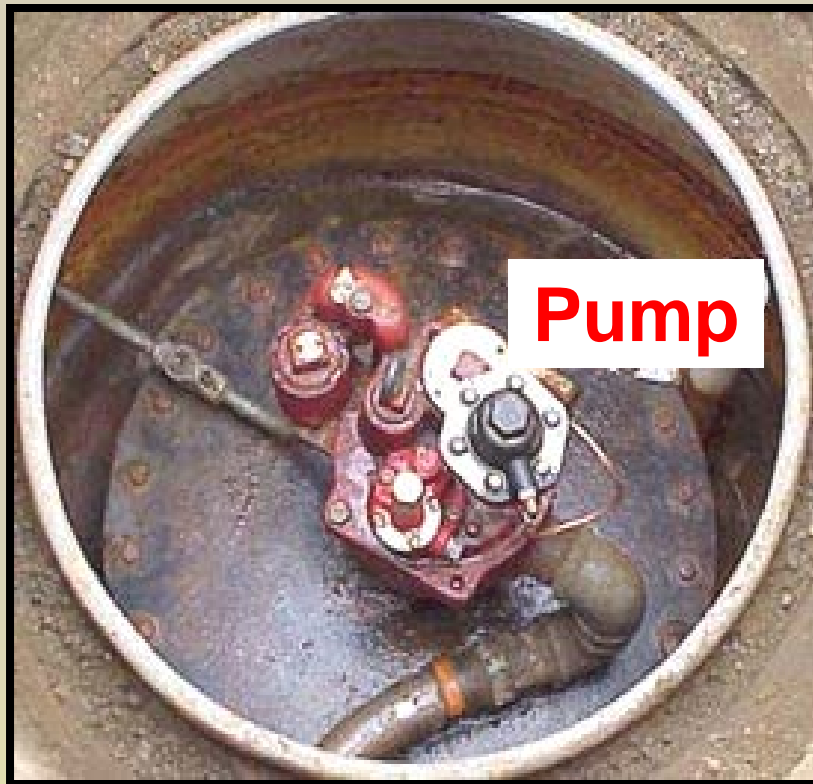
Piping Sumps



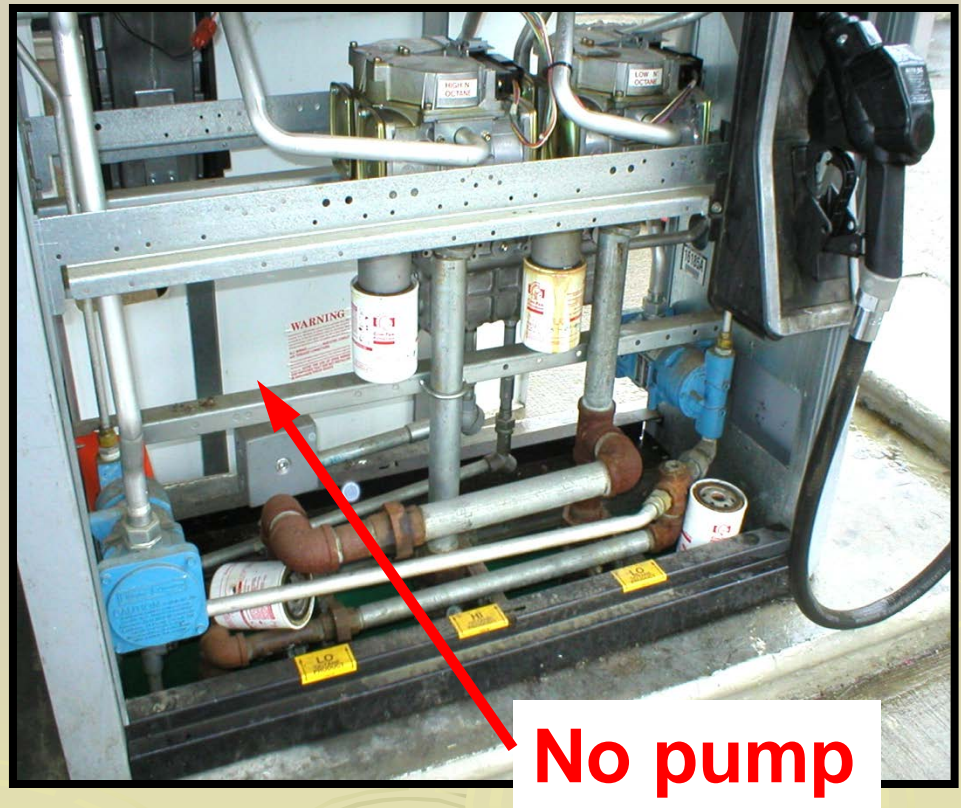
- Every 3 years tightness test
 - Exempt:
 - Piping continuously slopes to tank; and
 - No more than 1 check valve; and
 - Valve located at suction pump

Release Detection SW Pressure Piping

Piping Sump



Dispenser



Inventory Monitoring



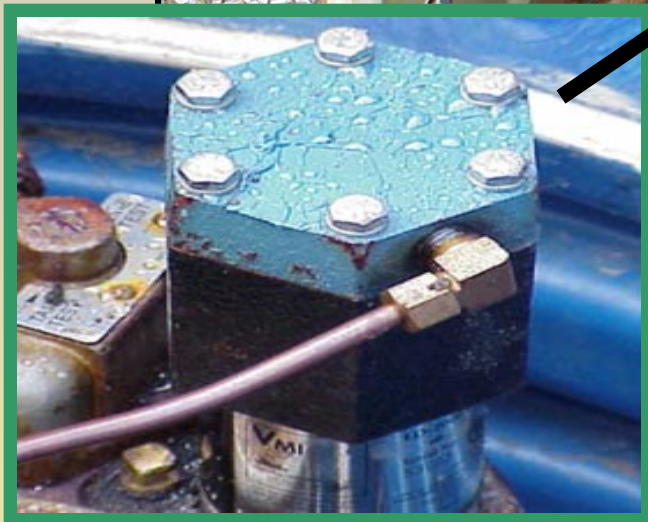
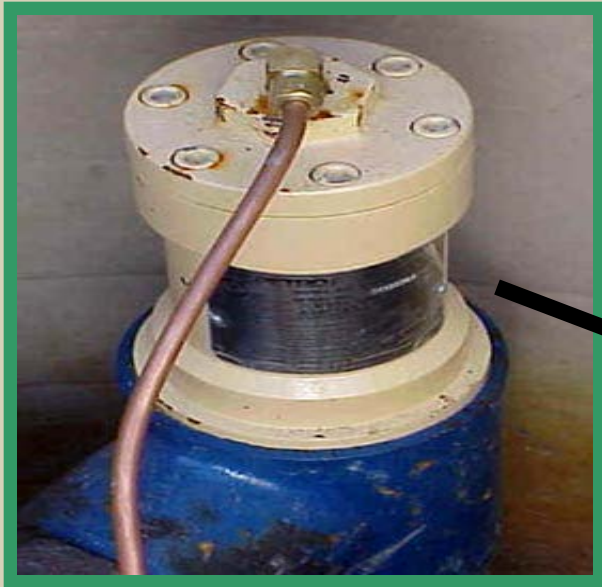
State of New Hampshire Department of Environmental Services
INVENTORY REPORT FORM (Env-Wm 1401.11)
 (See opposite side for instructions)

(a) AHDDES Facility ID#: _____ Facility Name: _____ Town: _____
 Tank Number / Capacity: _____ Product: _____ Month / Year: _____
 Column 1 2 3 4 5 6 7 8 9 10 For dates: Jan _____

| Day | (d) Opening Sick or ATG | (e) Sick / ATG Delivery | (f) Sick / ATG After Delivery | (g) Amount Delivered column (4-3) | (h) Closing Sick or ATG | (i) Use from Sick / ATG column (2+3-6) | (j) Netted column or Sales | (k) Daily Variance column (6-1)+(4-5) |
|--|--|----------------------------|-------------------------------------|--|-------------------------------|---|----------------------------------|--|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
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| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| (i) WATER | (f) Total monthly pump meter reading (sales) or sales (column 6) = | | | | | | | Monthly Gallons Over |
| Date | (g) MAXIMUM ALLOWABLE LIMIT (Monthly Variance) Total monthly pump meter reading (sales) or sales (f) x 1% = 150 gal. = max. gallons allowed | | | | | | | Monthly Gallons Short |
| | x0.01 = 130 gal. = Maximum Allowable | | | | | | | |
| (k) If any of the following occur, then phone (603) 271-3544: | | | | | | | | |
| 1. If monthly variance (g) is greater than max. allowable (i); | | | | | | | | |
| 2. If total water depth is greater than the allowable 3" (e); or | | | | | | | | |
| 3. If change in water depth is greater than the allowable 2" (e). | | | | | | | | |
| (j) Owner Signature _____ | | | | | | | | |
| *NOTE: ALL COLUMNS ARE IN GALLONS | | | | | | | | |
| NOTE: (a) MEASUREMENT OF LIQUID STORED MAY BE TAKEN AT THE START OF DAY AND / OR END OF OPERATING DAY. | | | | | | | | |

Line Leak Detector (LLD)

All Pressurized Piping




LLD Requirements

All pressurized piping:

- Restrict or stop flow when there is a leak
- 3 gallons/hour or greater



Mailing Address:
 STATE OF NEW HAMPSHIRE
 DEPARTMENT OF ENVIRONMENTAL SERVICES
 ONE RENAISSANCE CENTER AND COMPLIANCE BUILDING
 RPO-DES-50
 CONCORD, NH 03301-0051 Phone: (603) 271-1264 Fax: (603) 271-1311



ANNUAL LINE LEAK DETECTOR TEST FORM FOR UNDERGROUND STORAGE TANK SYSTEMS

*For Use by the Owner of New Hampshire
 H. H. Code of Administrative Rules Sec. 1601.30*

New Hampshire Department of Environmental Services (NHDES) has developed this form to help you document the required annual testing of the line leak detector (LLD) at this underground storage tank facility. For specific guidelines on testing consult with the LLD manufacturer.

Facility Name: _____ DES Facility # / Site #: _____
 Facility Address: _____ City: _____ Zip: _____

- The NH Code of Administrative Rules H. H. Code 1601.30, "All pressurized piping shall be equipped with an automatic line leak detector which shall restrict or stop the flow of the stored substance and trigger an audible or visual alarm upon detecting a leak at a rate of 3 gallons per hour at a pressure of 10 pounds per square inch line pressure within one hour. Automatic line leak detector shall be tested annually to confirm that they are operating according to manufacturer's requirements. The test results shall be submitted by the owner to the division no later than 30 days after the date of the test."
- Line leak detector is required to be tested in-place. Do not remove and test outside the system.

Test Information and Results

| Tank Number: (for split tanks use (A), (B)) | Tank # | Tank # | Tank # | Tank # | Tank # |
|---|--------|--------|--------|--------|--------|
| Product Stored: (gas, diesel, oil) | | | | | |
| Capacity: (gallons) | | | | | |
| LLD Manufacturer: | | | | | |
| LLD Model Number: | | | | | |
| Tested Leak Rate: (gallons per hour) | | | | | |
| Results: | Pass | Fail | Pass | Fail | Pass |

Complete following entry if any of the above LLDs have failed and replaced with NEW LLDs.

| REPLACED LLD Manufacturer: | LLD Model Number: | Tested Leak Rate: (gallons per hour): | Results: |
|----------------------------|-------------------|---------------------------------------|---|
| | | | Pass Fail Pass Fail Pass Fail Pass Fail Pass Fail |

An automatic line leak detector failure shall be indicated by a leak rate of greater than 3 gallons per hour at a pressure of 10 pounds per square inch line pressure within one hour. The failed line leak detector shall be repaired or replaced immediately and shall meet the requirements of H. H. Code 1401.30(d). The affected piping system(s) shall be taken out of service until satisfactory repairs are made or the line leak detector is replaced.

Verification - I, hereby, verify that the automatic line leak detectors were tested to confirm that they are operating according to manufacturers' requirements.

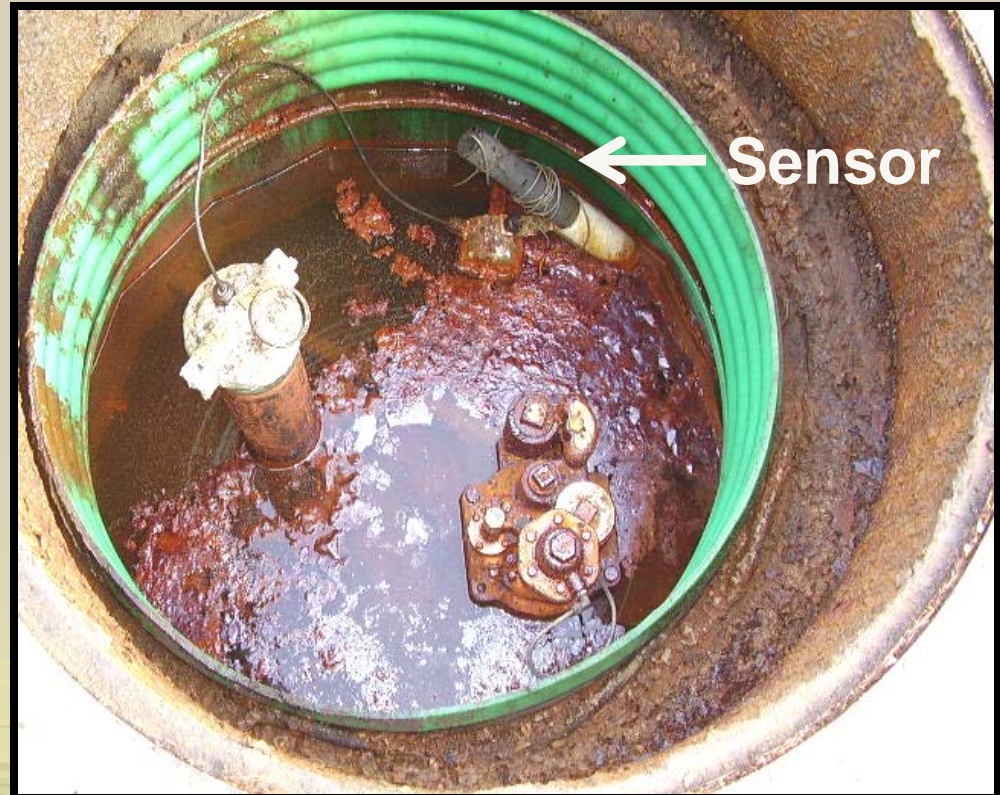
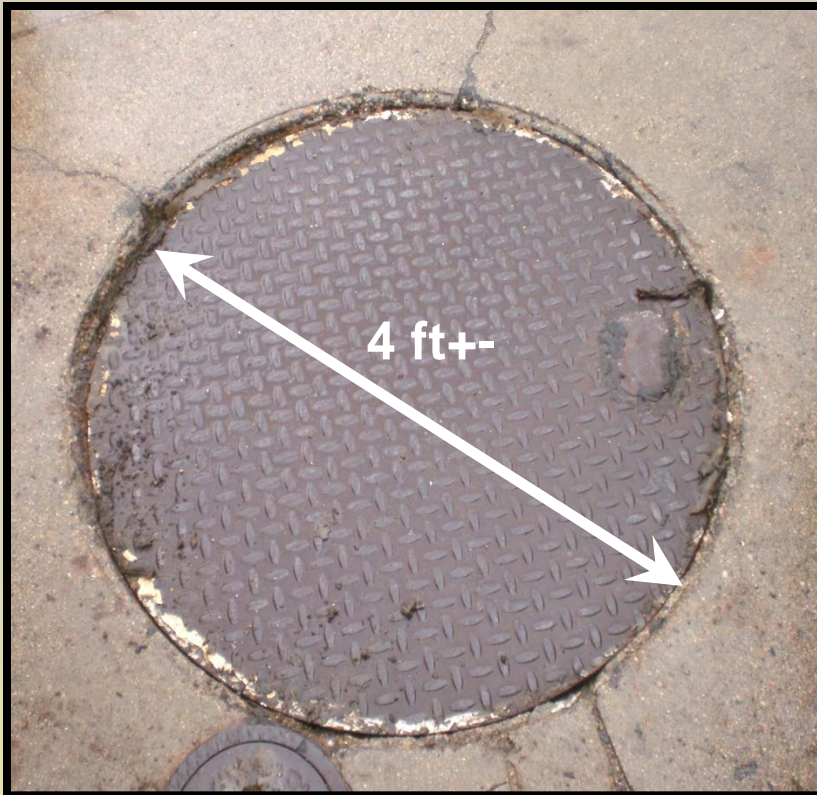
LLD Manufacturer / Tester Identification Number: _____
 Technician Name (print): _____ Testing Company Name: _____
 Testing Co. Address / State / Zip: _____
 Signature: _____ Phone No.: () _____ Date of Test: _____
 April 2004

Leak Monitoring

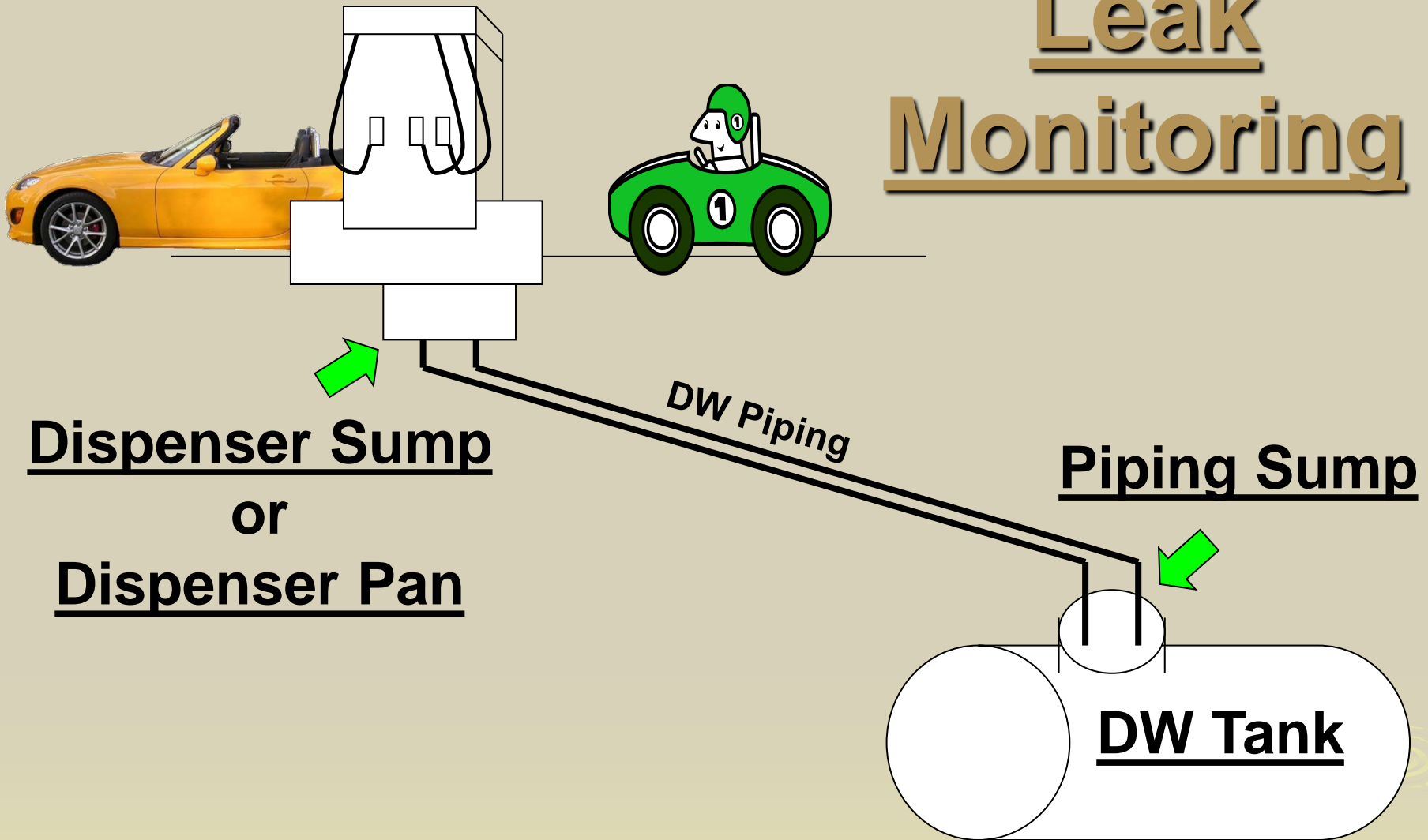
Double Wall (DW)

Tank in a Tank - Piping in a Pipe/Sump

Piping Sump



Leak Monitoring



- DW tank and/or DW piping **with sensors**

Leak Monitoring

Consoles for DW Tank & Piping



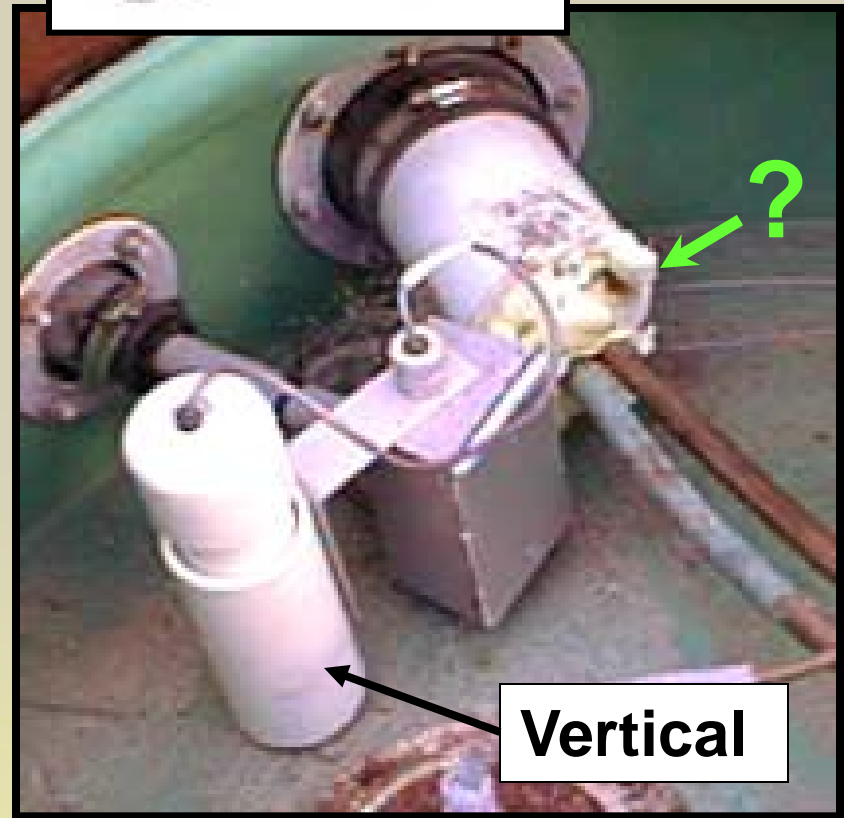
Leak Monitoring

Console for DW Tank & Piping

- Operate continuously
- Audible and visual indicator
- Identify location of sensors
 - L3 Regular Tank Piping Sump

Leak Monitoring Sensors

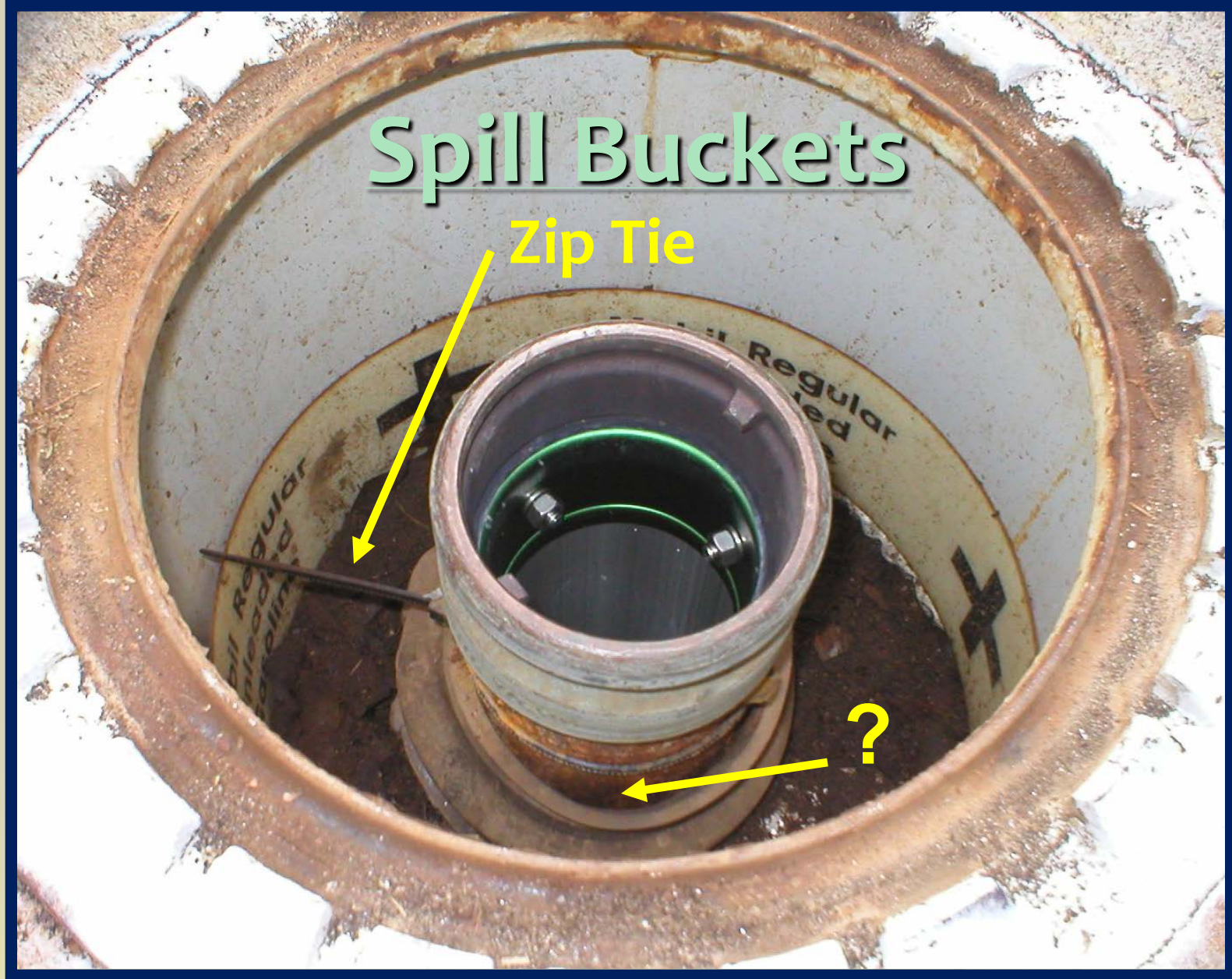
- Location:
 - Tank DW (interstitial)
 - Piping sump
 - Dispenser sump
- Be secured at low point
- Space maintained free of liquid and debris



Spill & Overfill Devices

- **Spill Containment**
- **3 Overfill Device Methods**
- **2 Delivery Methods**





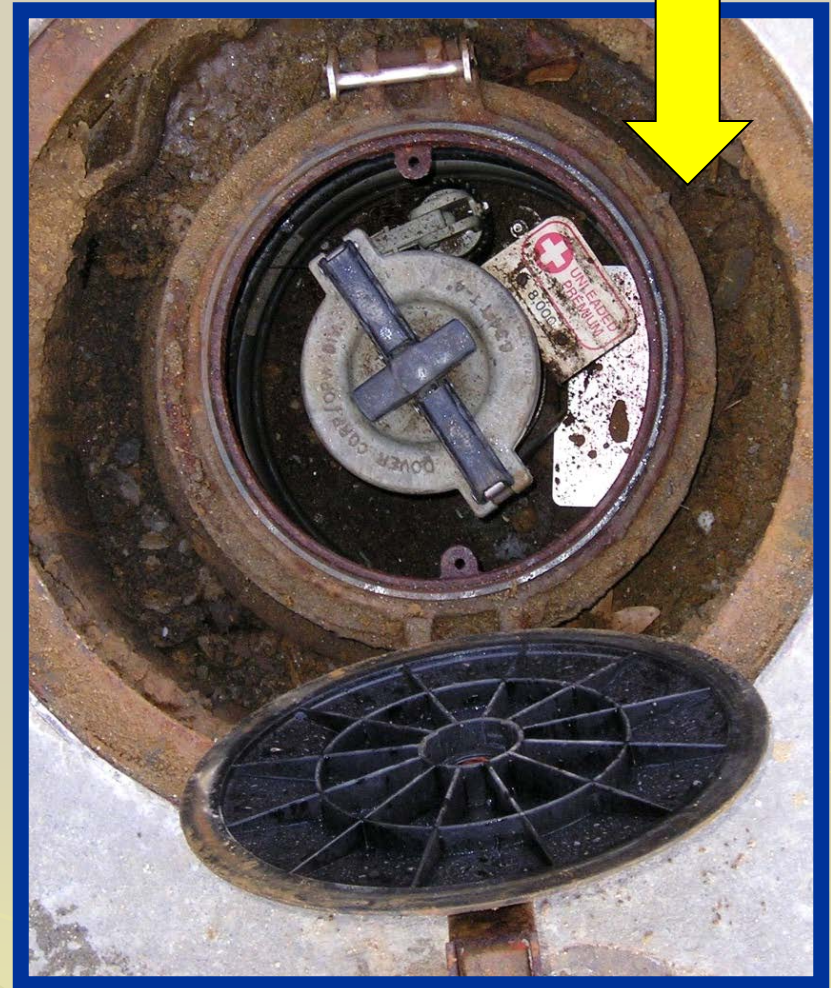
Minimum 5 gallon & free of liquid and debris

Inspections 101 webinar

Main Function

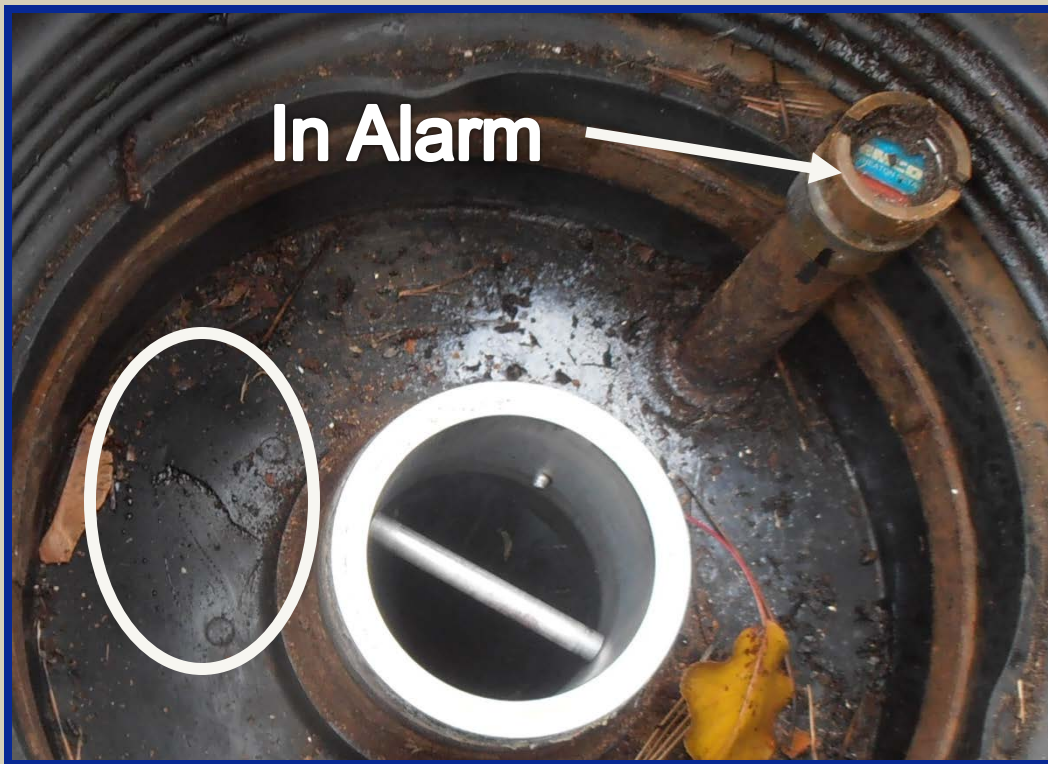
To prevent product from entering backfill

15 Gallon



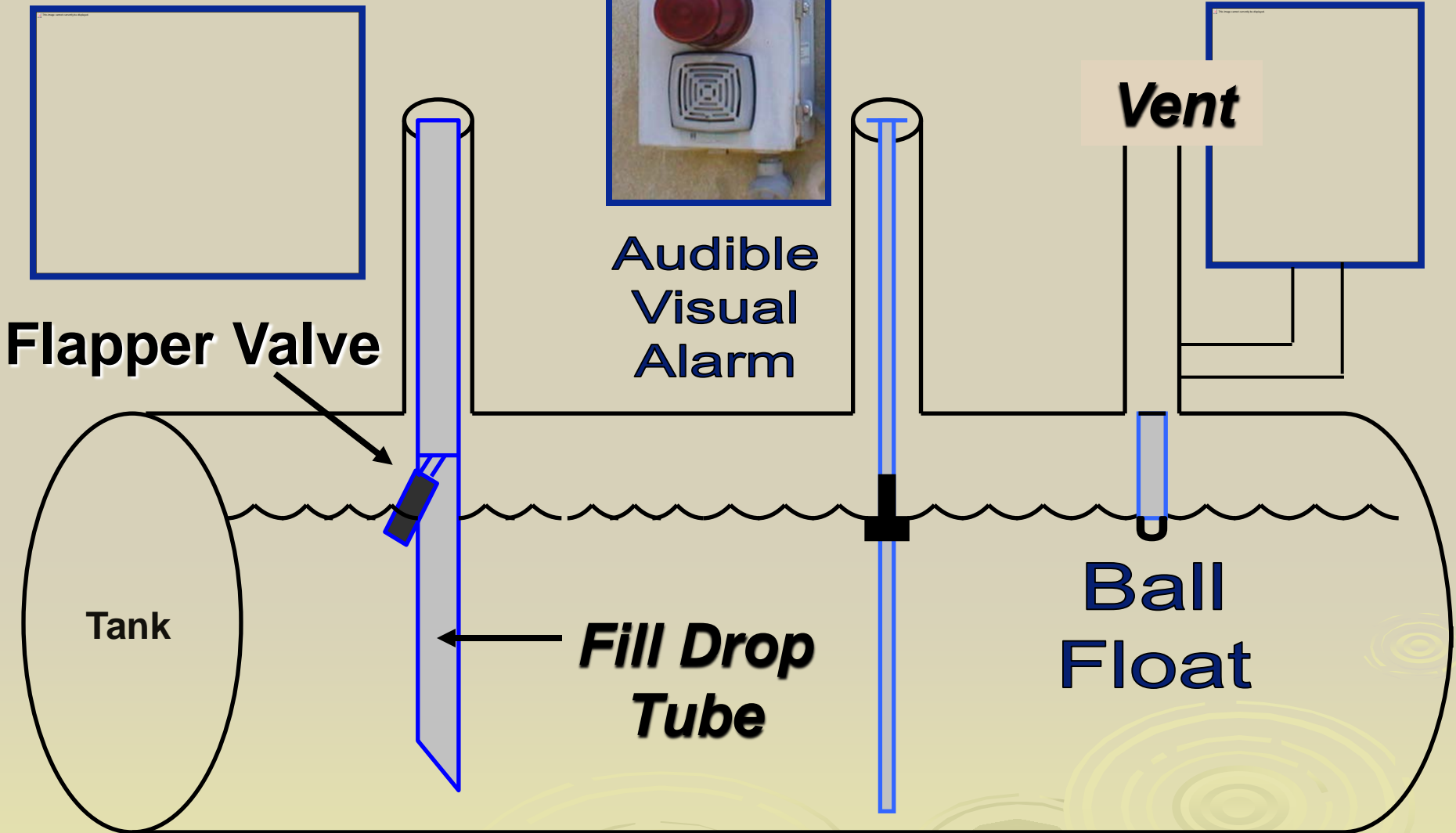
What is wrong?





Overfill

Devices



Drop Tube Overfills



**EMCO
Wheaton
Guardian
A1100**

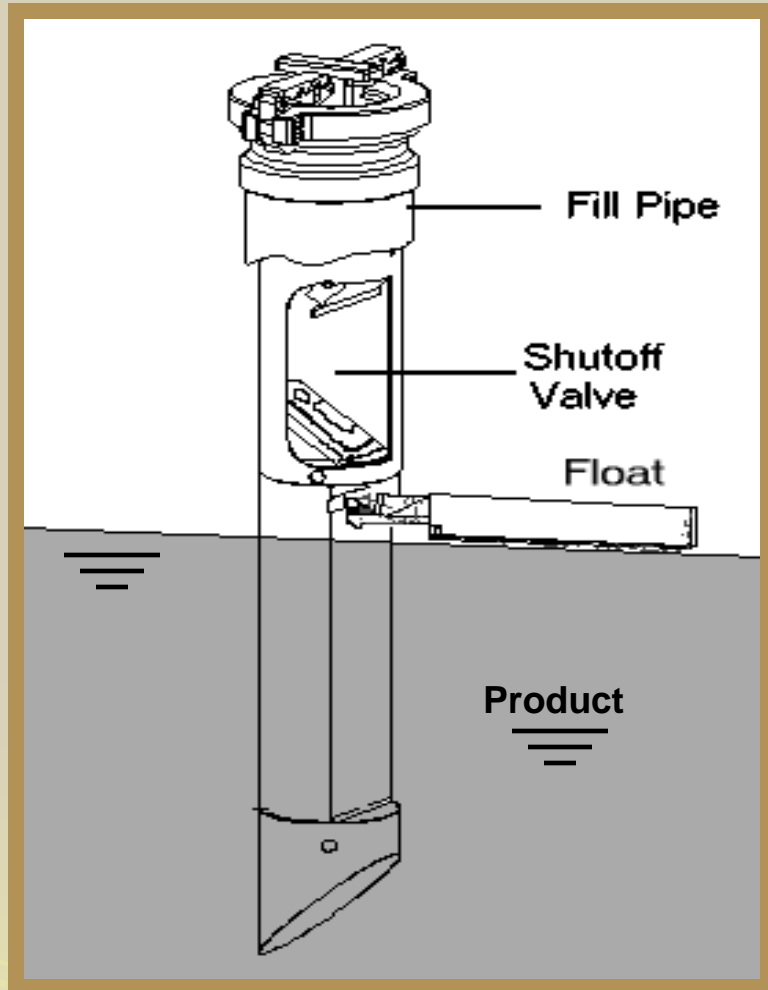
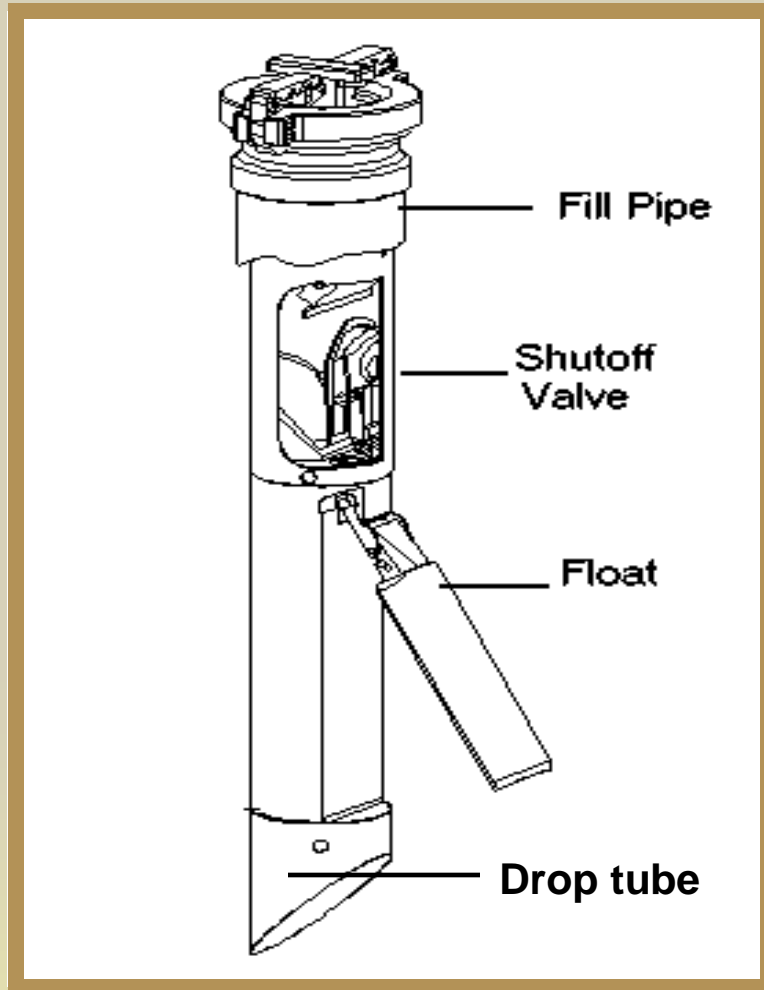


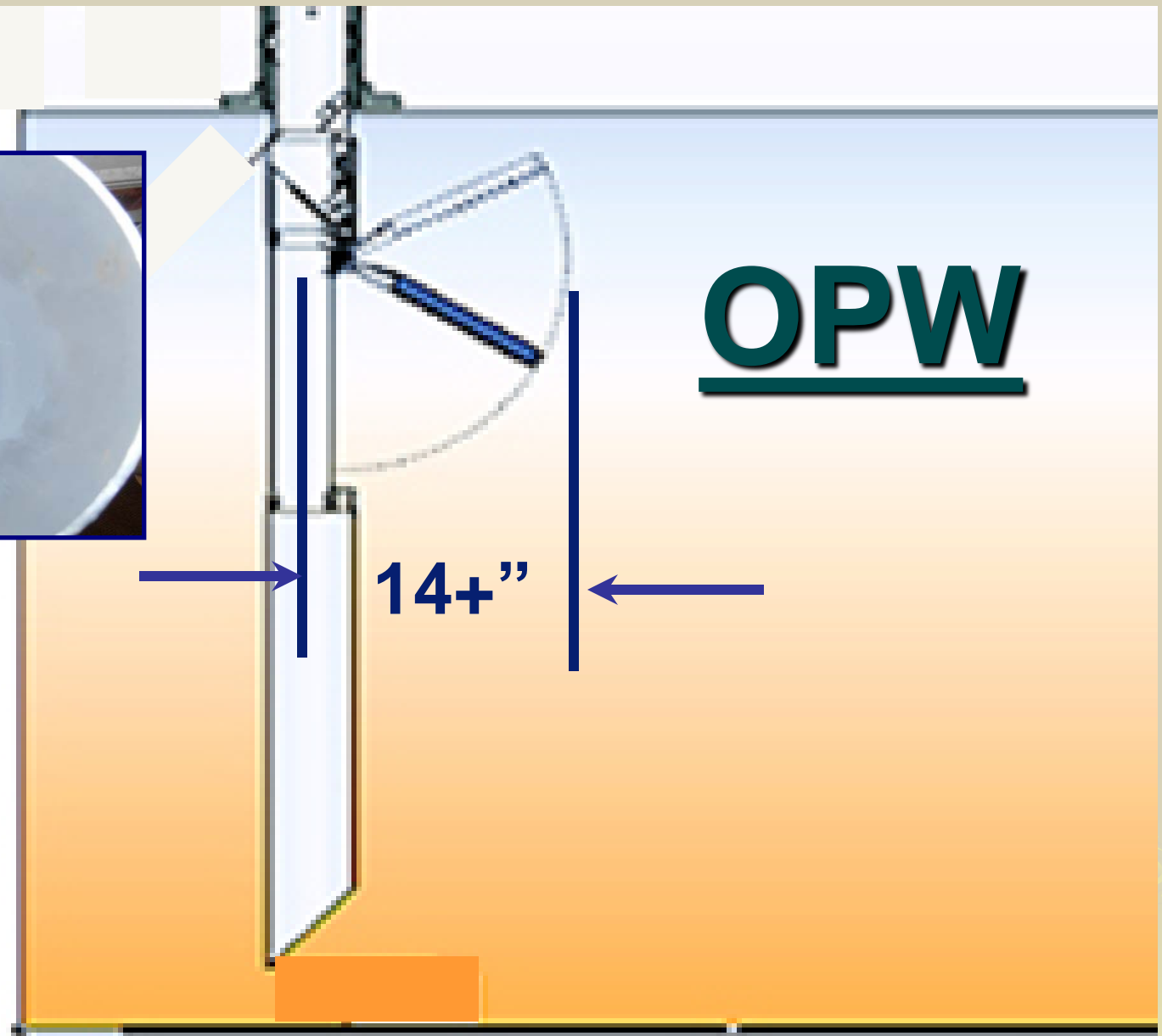
**OPW
61SO / 71SO**



**EBW
Auto Limiter II**

Flow Stop Device = 95% max level Flapper Valve (installed in fill drop tube)

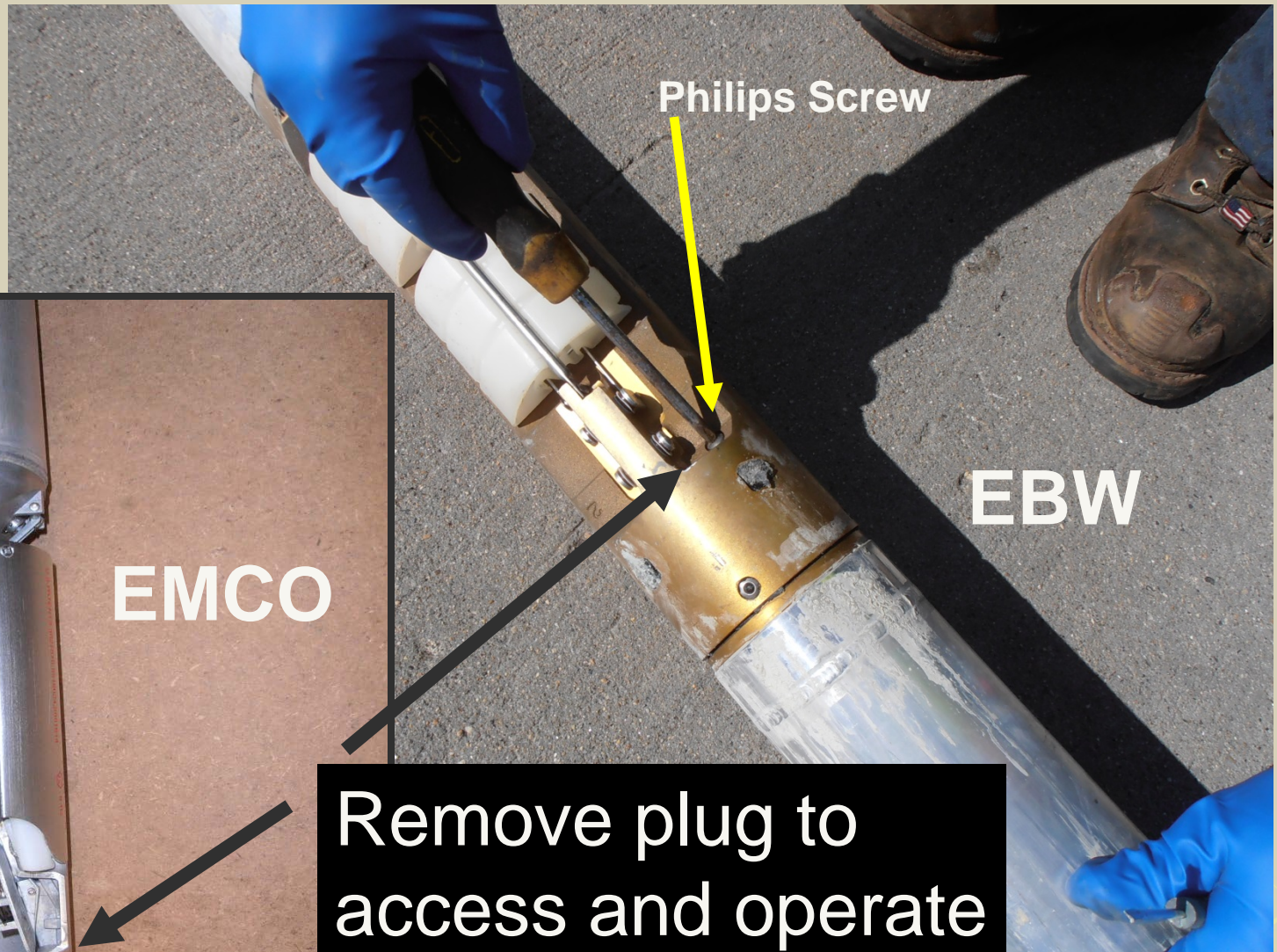




OPW

14+\"

OPW 61S0R-4000



Philips Screw

EBW

EMCO

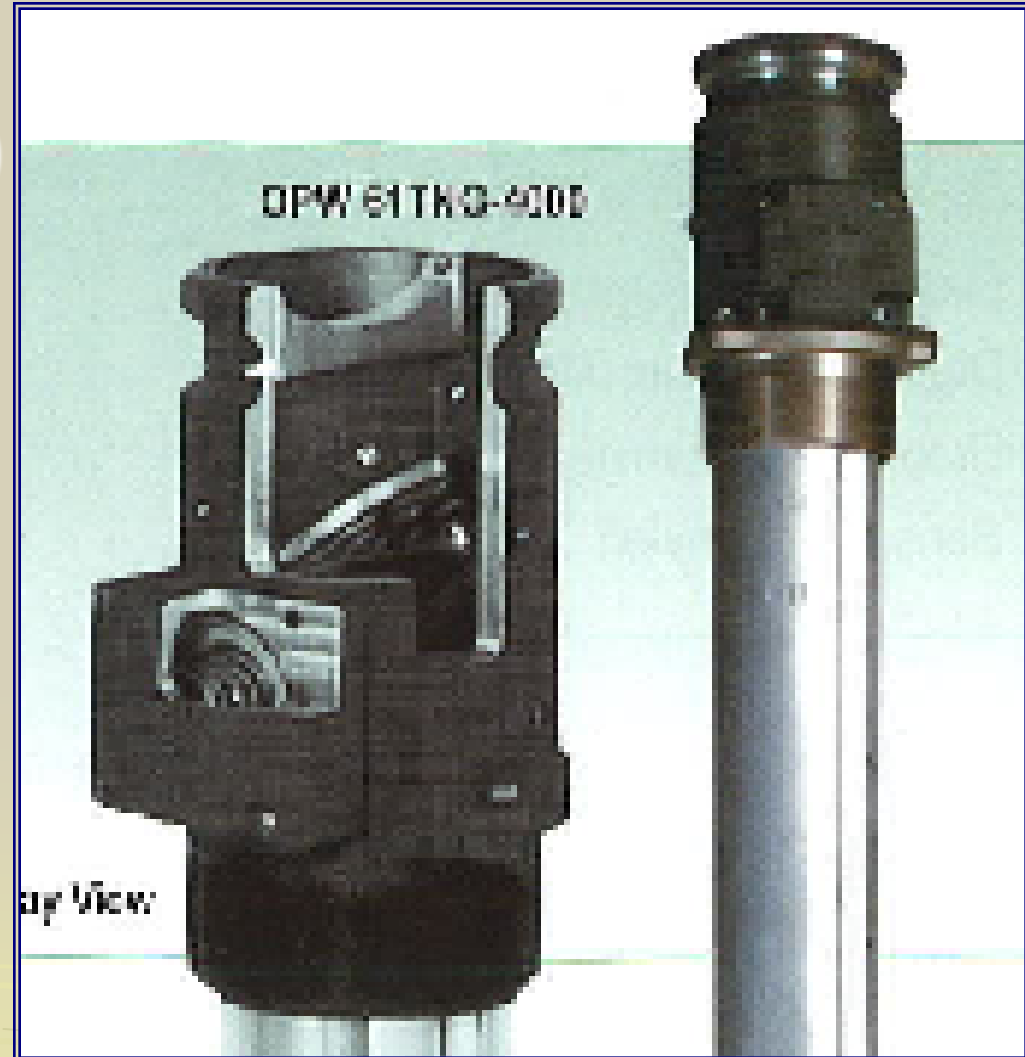
Remove plug to
access and operate
flapper valve

Allen
7/64"
Plug

1/8"
Pivot

Drop Tube OF

- OPW 61TNG-4000
 - Vacuum operated



Top Section



Problems



Bottom Section

Why Remove



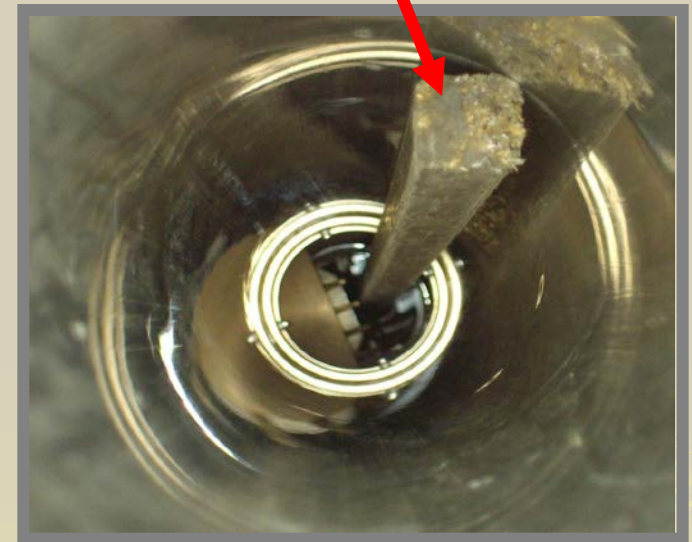
What NOT to do



**Pressure
delivery with
flapper valve**

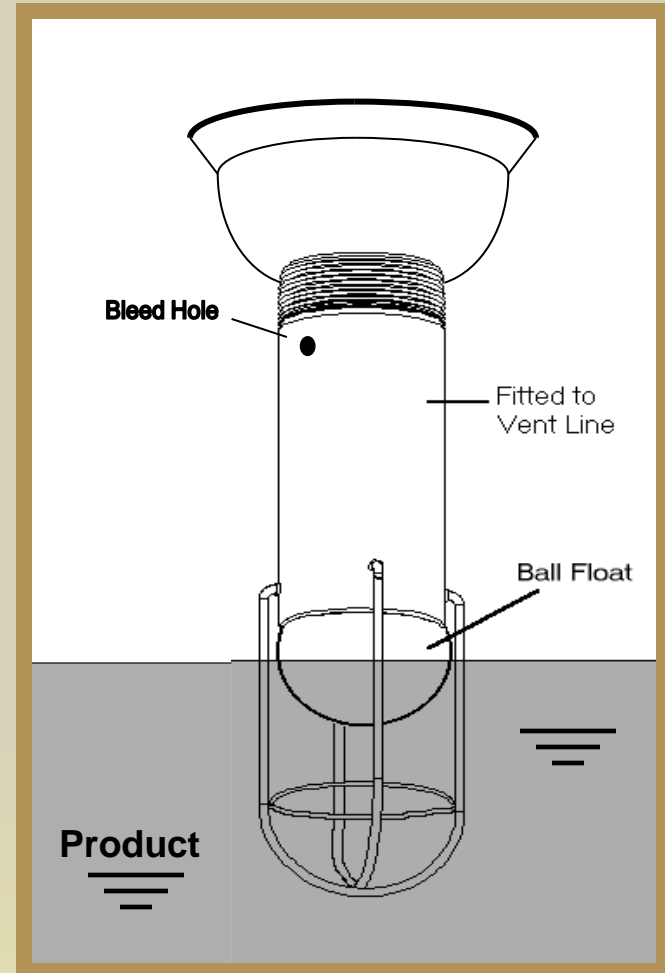
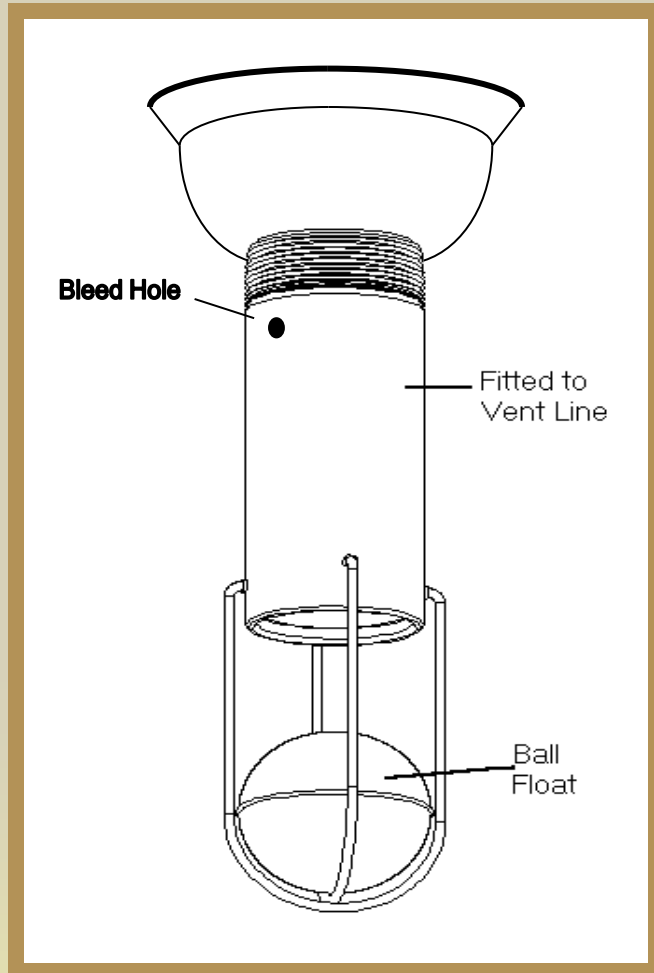


**Inside
fill drop tube**



Flow Restricting Device = 90% fill level

Ball Float (installed in tank at vent locations)



Ball Float OPW

Standard Ball Float

1/8" Bleed
hole

4 Prong cage
with bleed
holes



30 Minute 30VML

Gasket (missing)

1/16" Bleed
hole

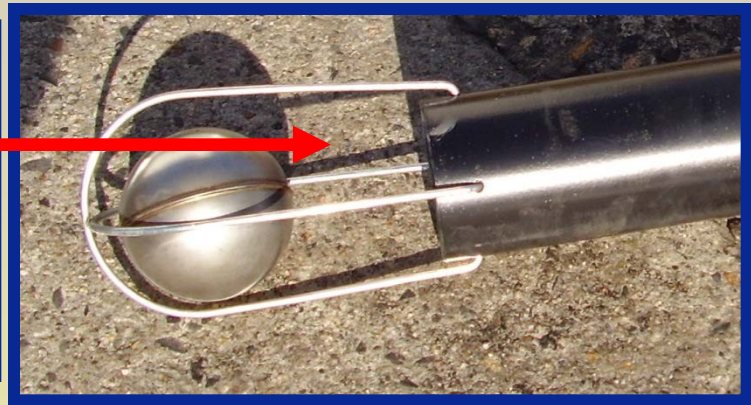
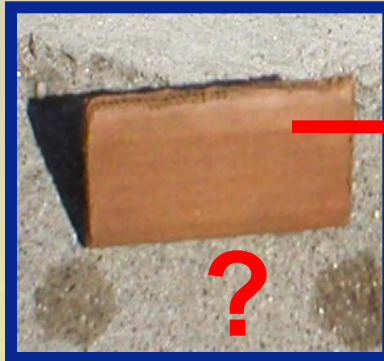
Spiral cage

Bad Signs



Also short, not set for 90%

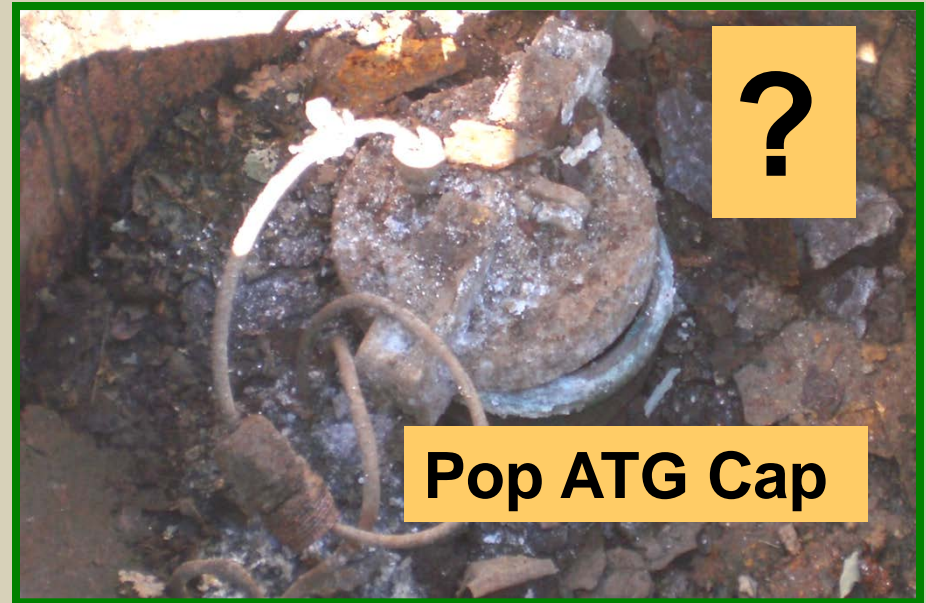
Bad Signs



Problems



Leaking Drain Valve



Pop ATG Cap

During delivery----product head pressure

Top of delivery truck to ball float = 11 vertical feet

Note: 11.5' = 5 psi

(Can over pressurize tank)

Alert Device = 90% fill level

High Level Audible/Visual Alarm



Horn



Light



High Level Alarm





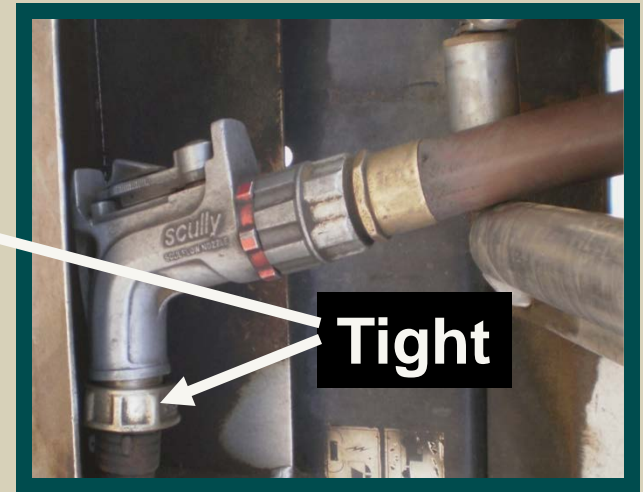
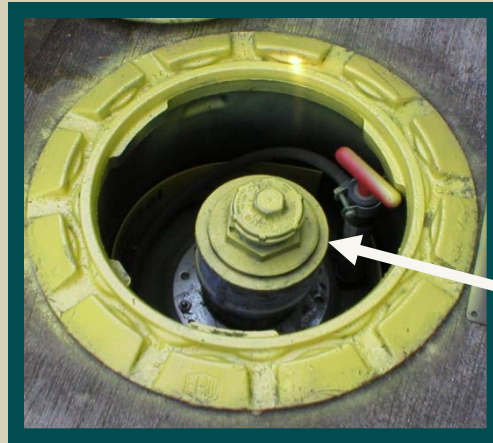
Gravity Delivery Method



300-400 gpm delivery
4" hose 20 feet long = 14 gallons

Pressure Delivery Method

***Pumped
(30-75 psi)
40-300 gpm***



Device-Delivery Compatibility

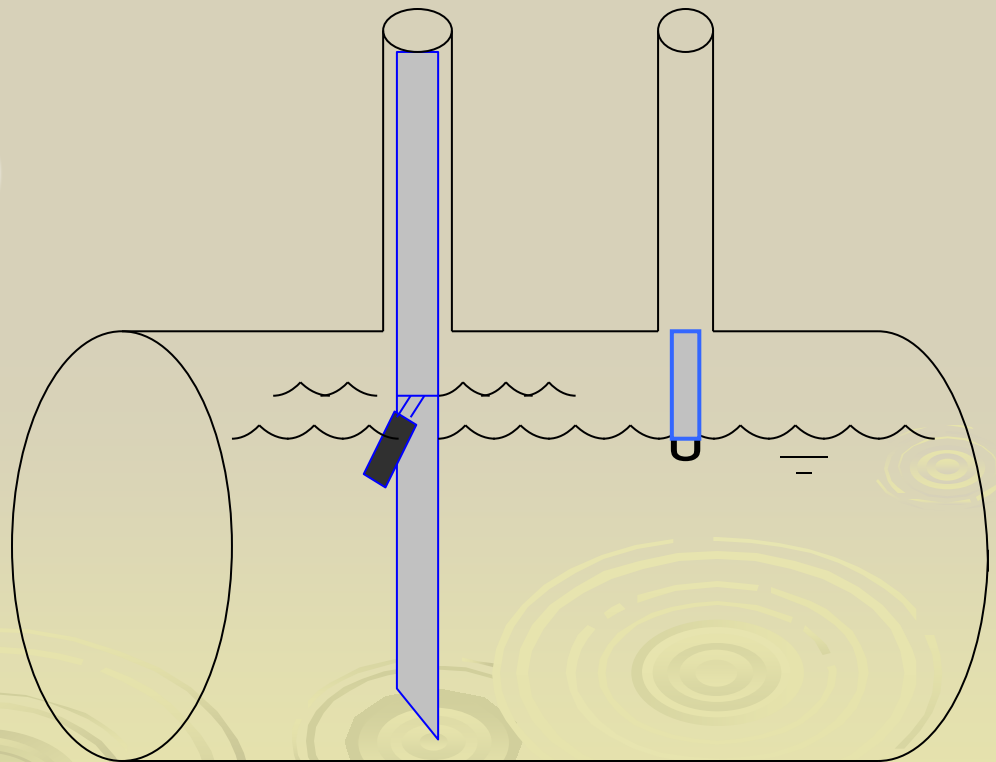
➤ Audible/Visual Alarm (AA)

- Suitable for either delivery method



➤ Flapper Valve (FV)

- Gravity only
tight connection
- Can not have
ball floats



Device-Delivery Compatibility

➤ Ball Float (BF)

- Gravity only - tight connection
- Multiple BF per tank
(vent, dry break, vapor recovery return pipe)
- Can not use with:
 - Coaxial drop tube
 - Suction pump dispenser
(air eliminator)



Corrosion Protection



2 protection methods

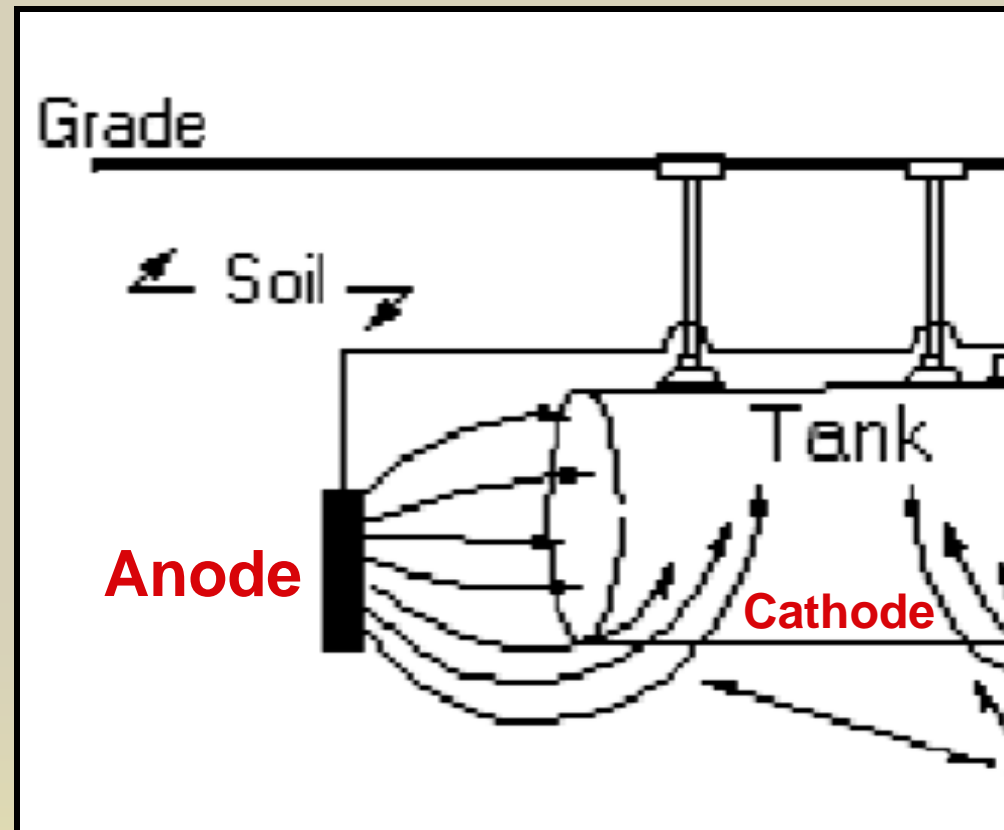
Tank Corrosion

**Tank
End**



Sacrificial Anode Method

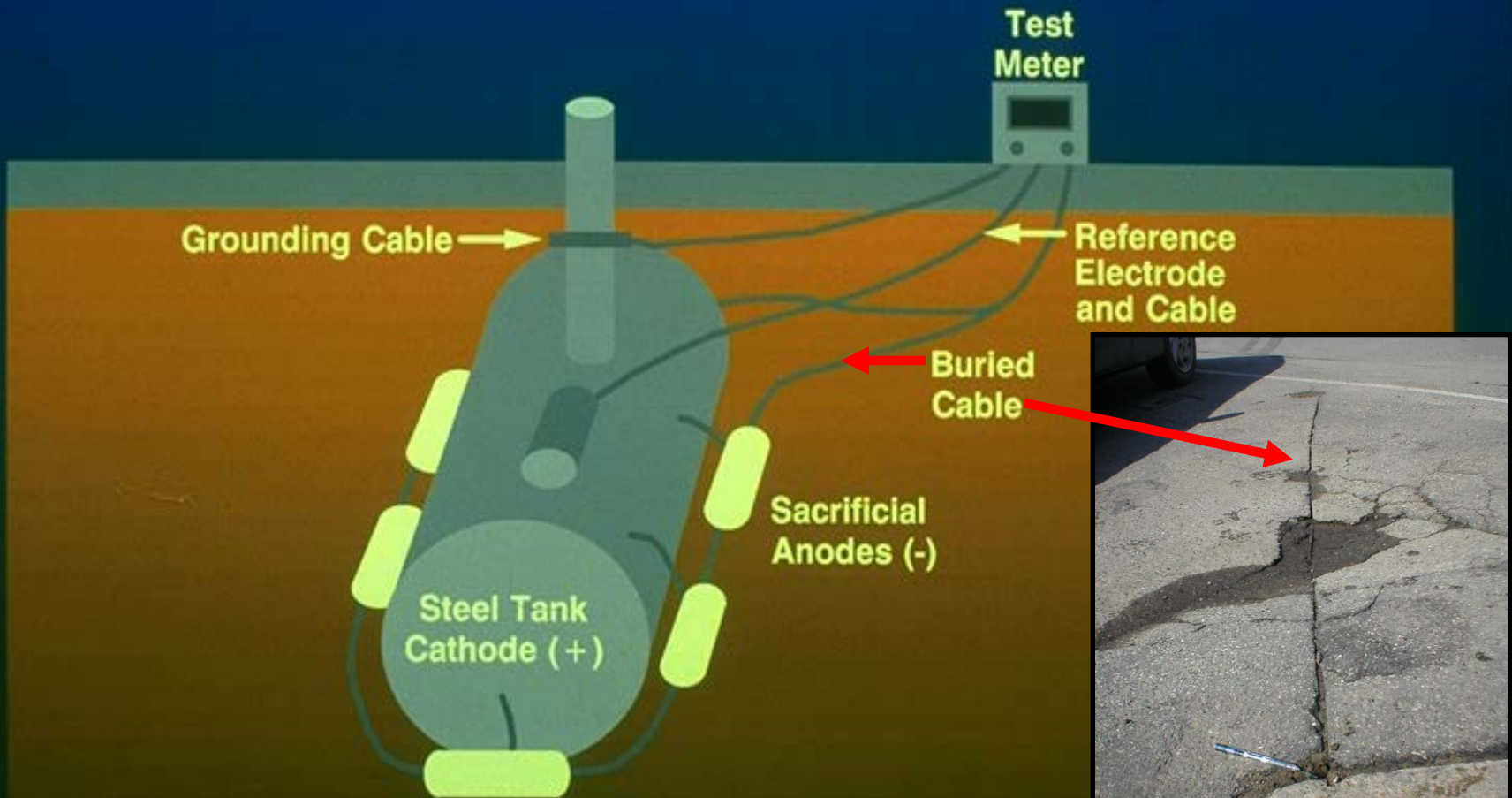
- Metal anodes
- More electrically active than the steel tank
- Anode corrodes away as current exits



Factory Installed Anode



Removed tank with factory anode

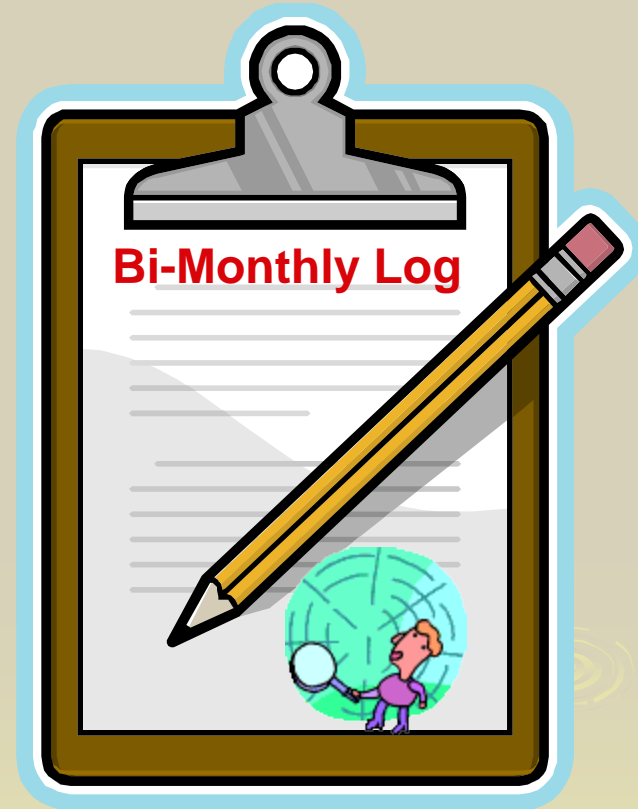


Cathodic Protection

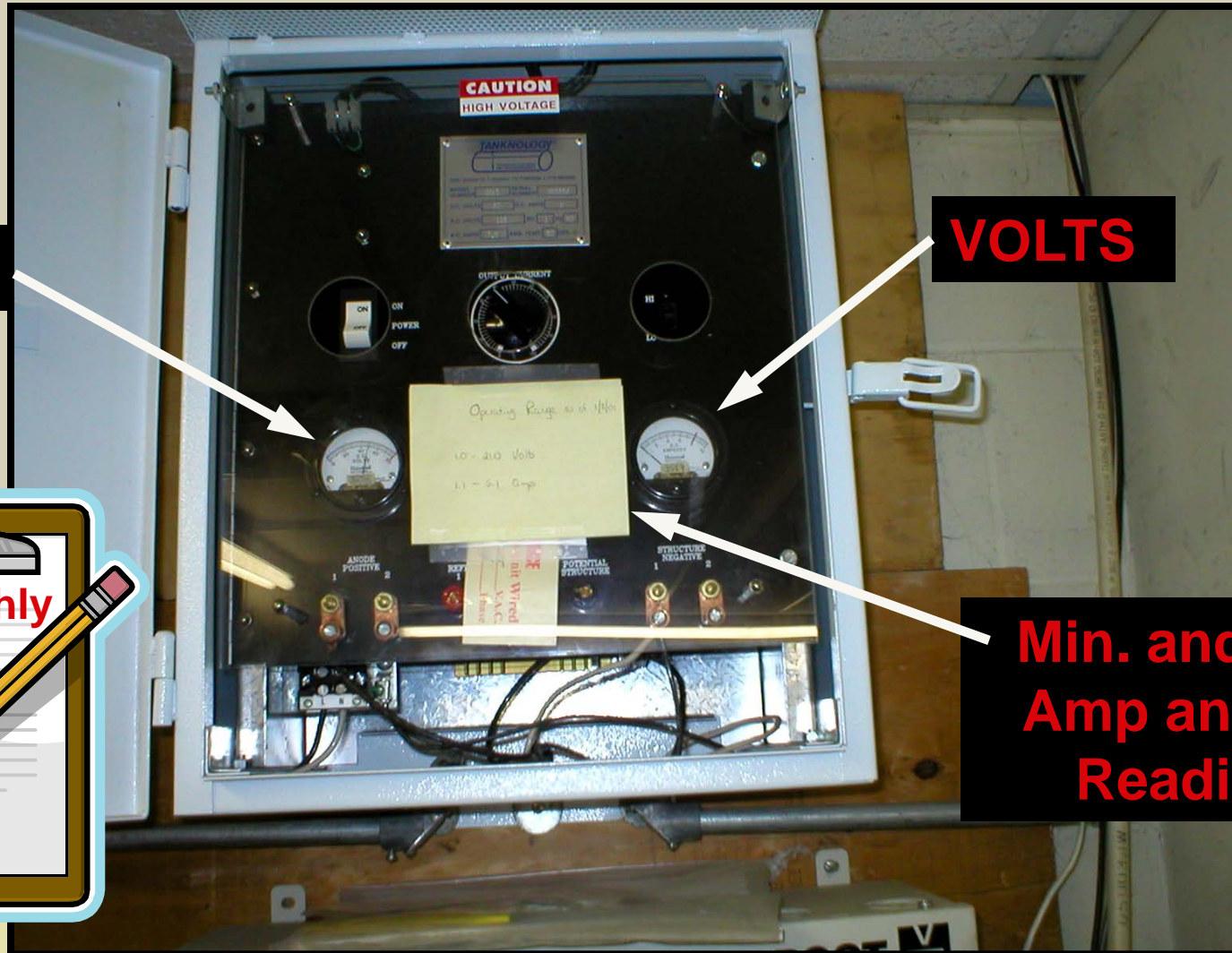
Typical Installation of Galvanic/Sacrificial Anode System

Impressed Current Method

- Rectifier
 - Alternating current (AC) to direct current (DC)
- Anodes deplete vs. tank.
- Owner/Operator required action
 - *(Bi-Monthly) inspection log
(every two months)



Impressed Current Rectifier



AMPS

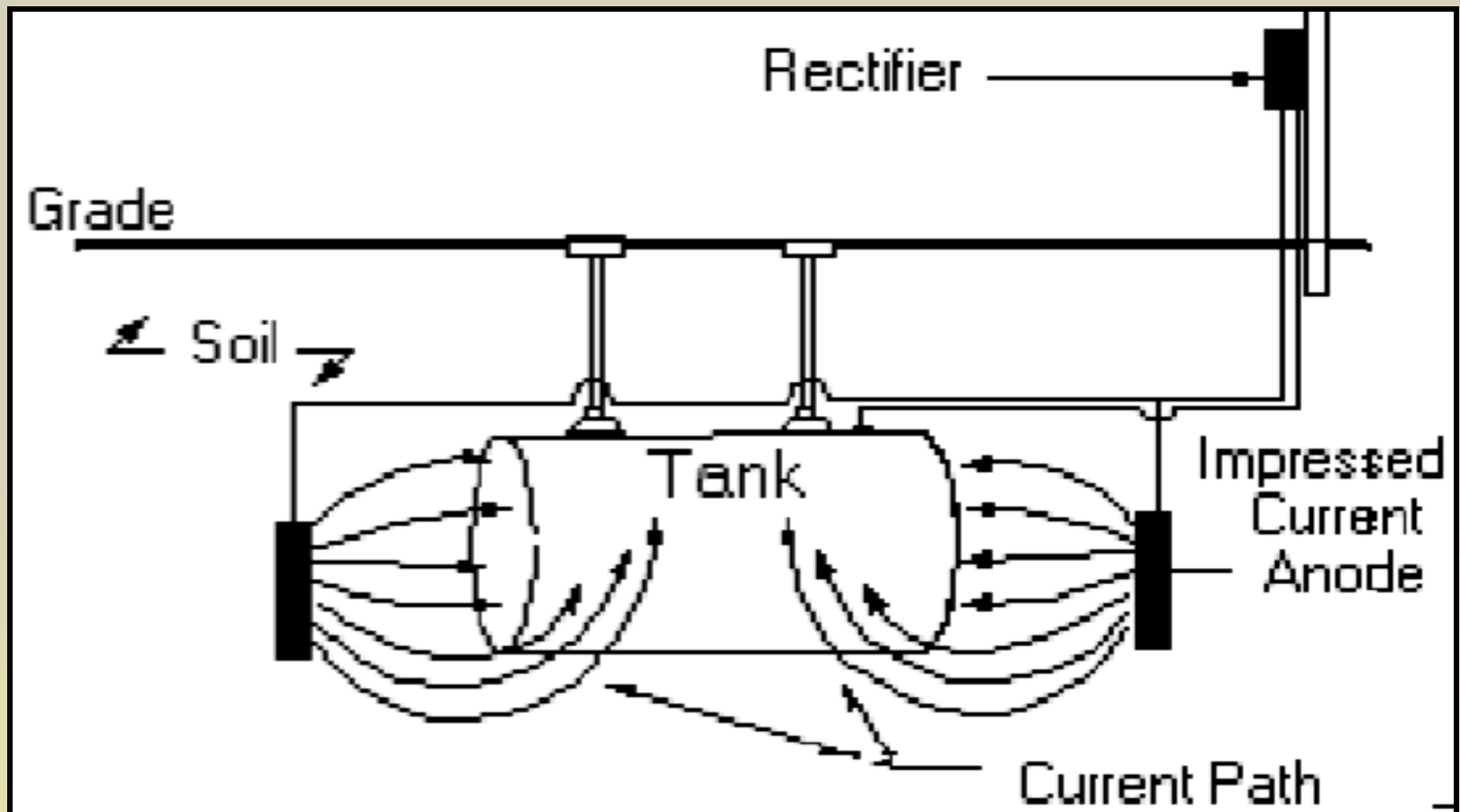
VOLTS

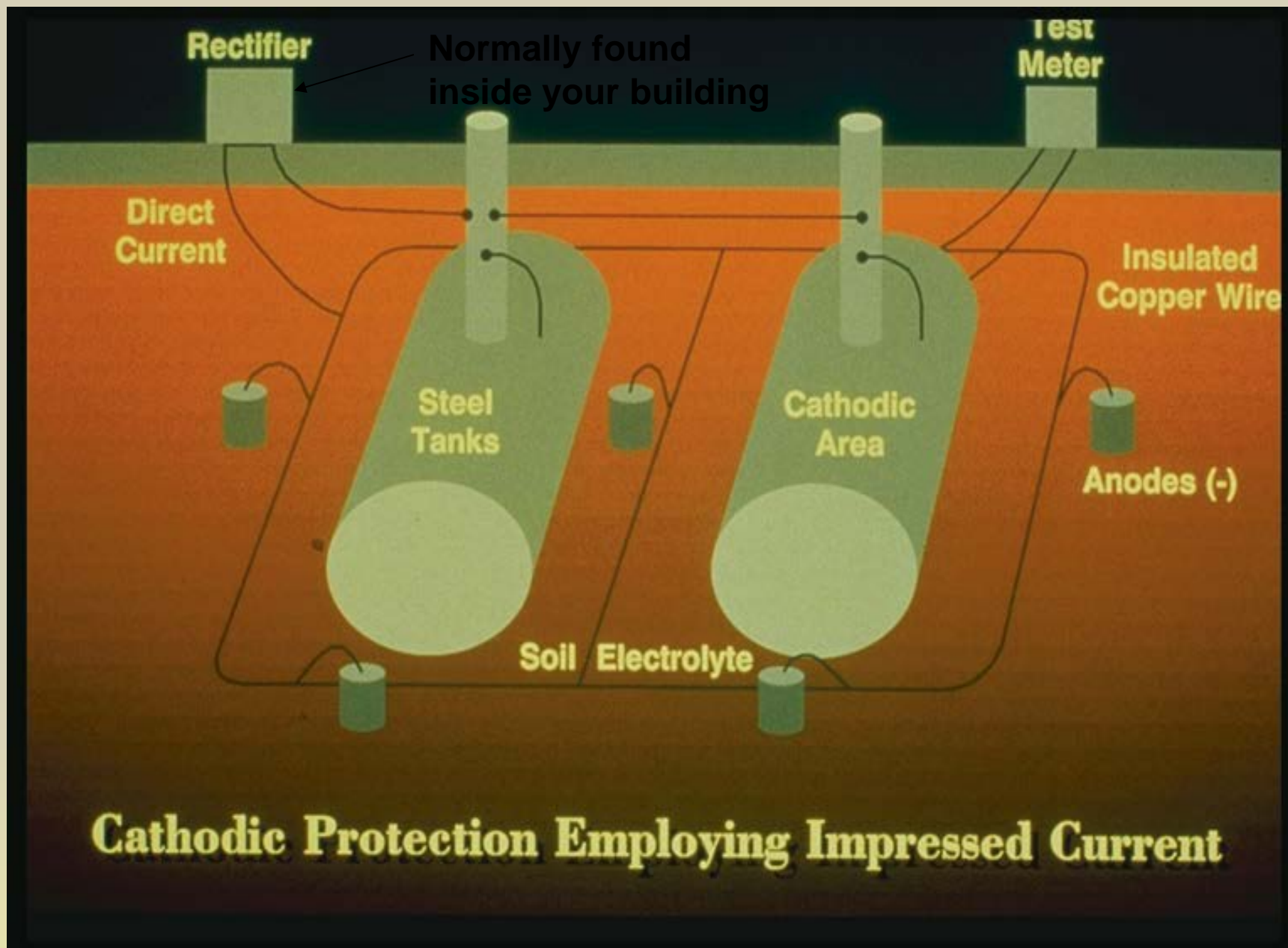
**Bi-Monthly
Log**

**Min. and Max.
Amp and Volt
Readings**

Impressed Current Pathway

➤ Rectifier → anodes → soil → tank → rectifier





Review

- Release Detection & Leak Monitoring
- Spill protection
- Overfill protection
- Corrosion protection

QUESTIONS??



Contact Information

Spruce C. Wheelock

NH Department of
Environmental Services

29 Hazen Drive, PO Box 95

Concord, NH 03302-0095

spruce.wheelock@des.nh.gov

(603) 271-2933

Spruce's Gas