



NEIWPCC Webinar Series
Presents
**UST INSPECTORS
TRAINING**

**Interstitial Monitoring
as a Whole System:
Containment, Sensing,
Monitoring**

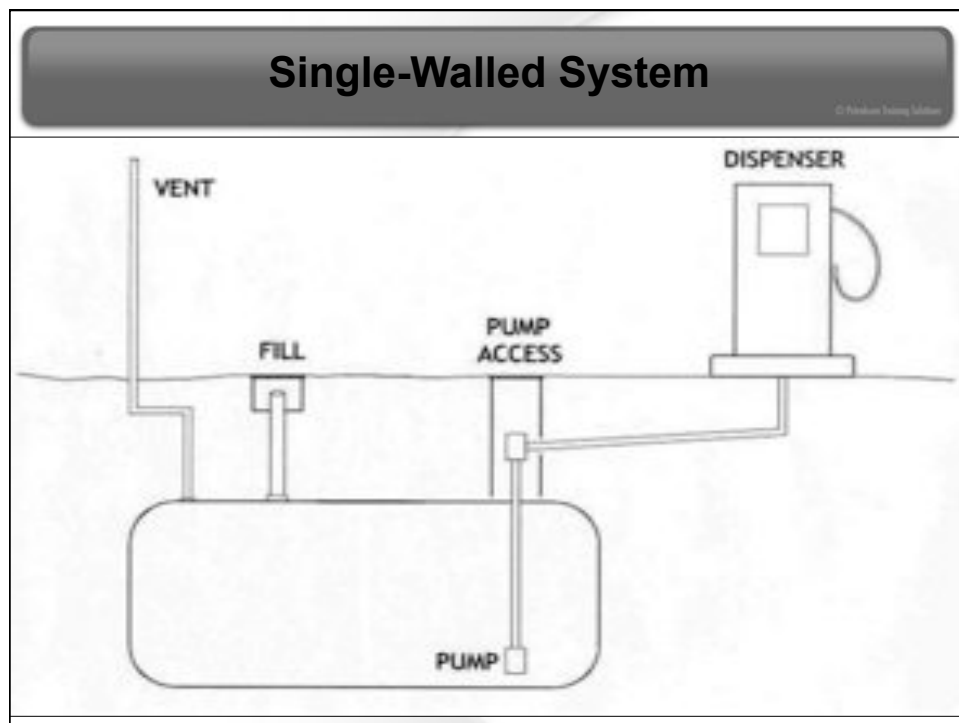
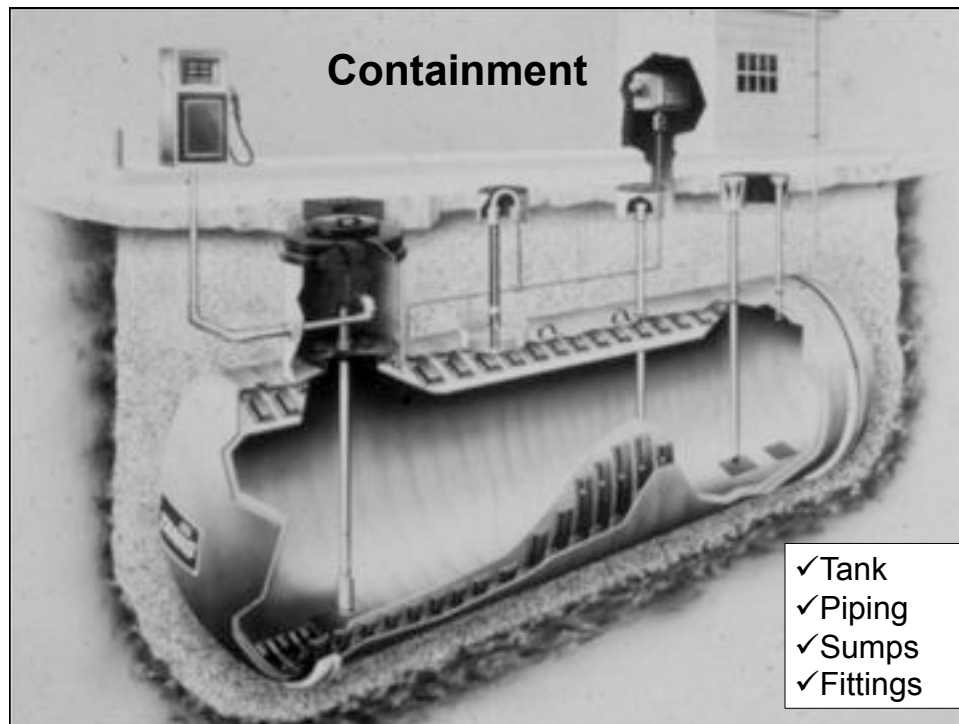
December 6, 2010

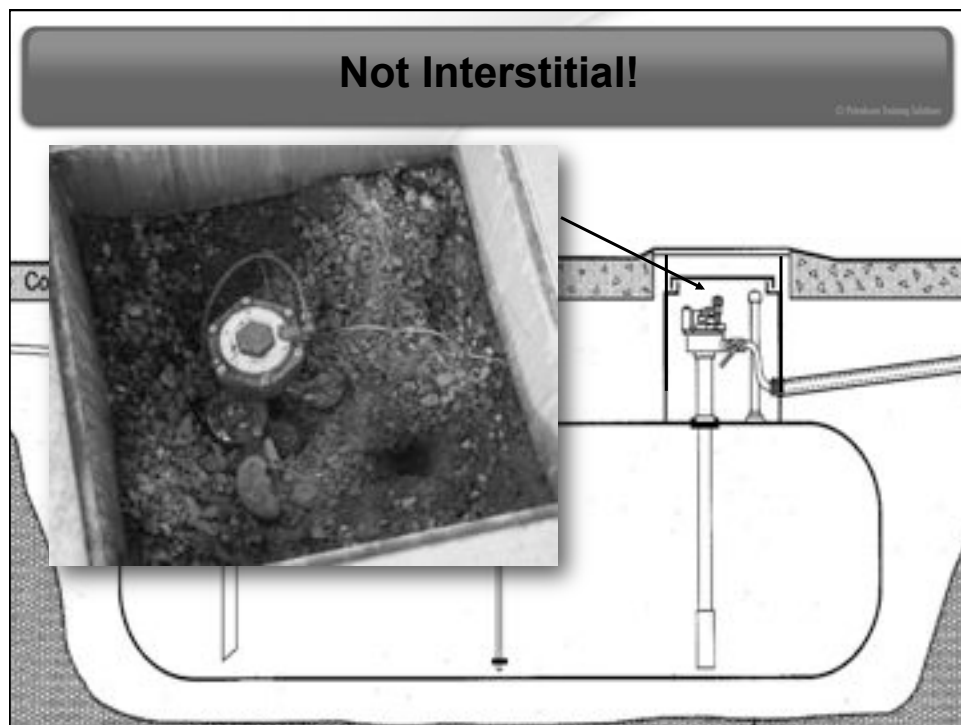
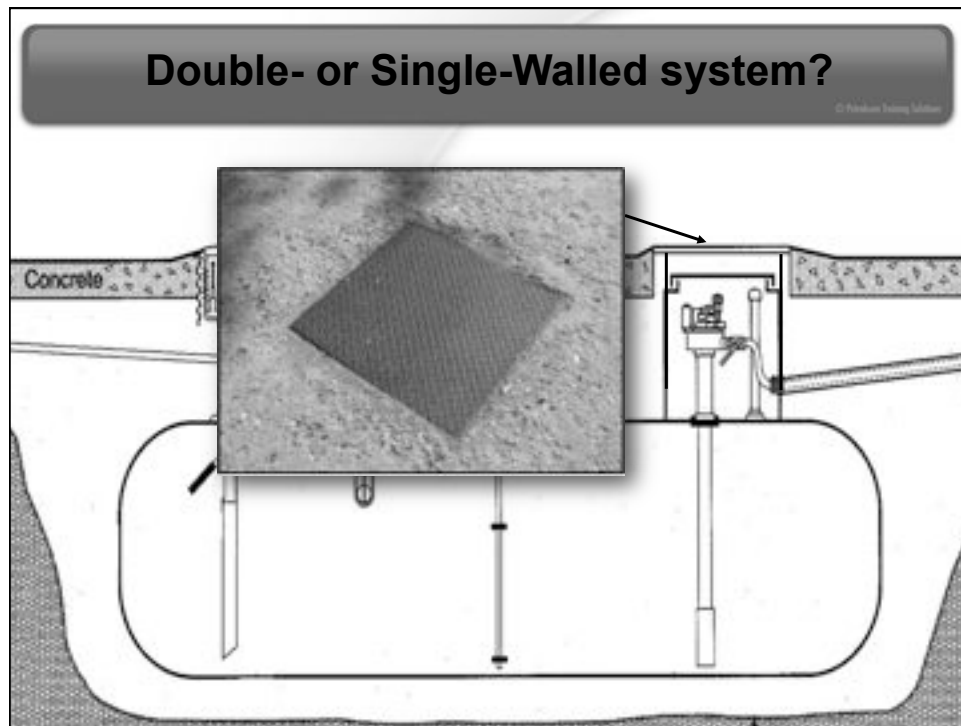
By Ben Thomas
www.USTtraining.com

 **Petroleum Training
Solutions**

Three Release Detection Concepts

- **Internal**
 - Inventory Control
 - SIR
 - Automatic Tank Gauging
 - Manual Tank Gauging
- **Interstitial**
 - Secondary Containment
- **External**
 - Soil Vapor and Groundwater Monitoring





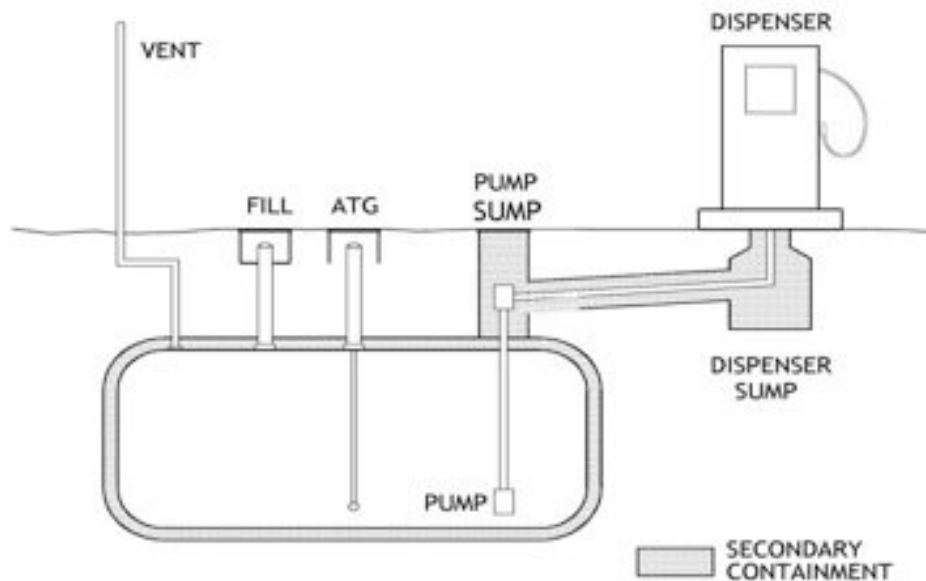
No Under Dispenser Containment

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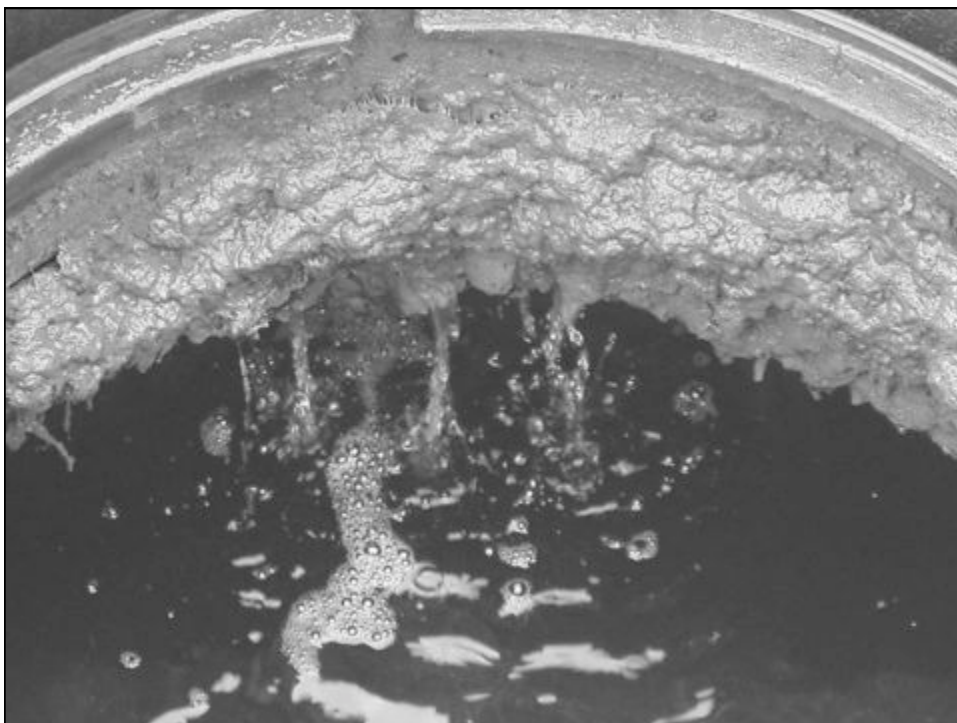


Double-Walled System

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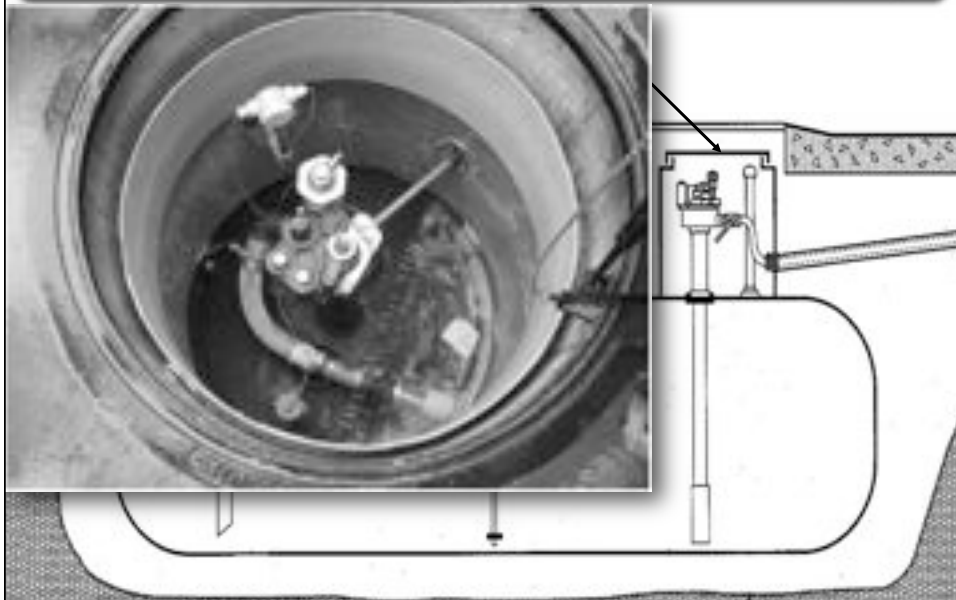


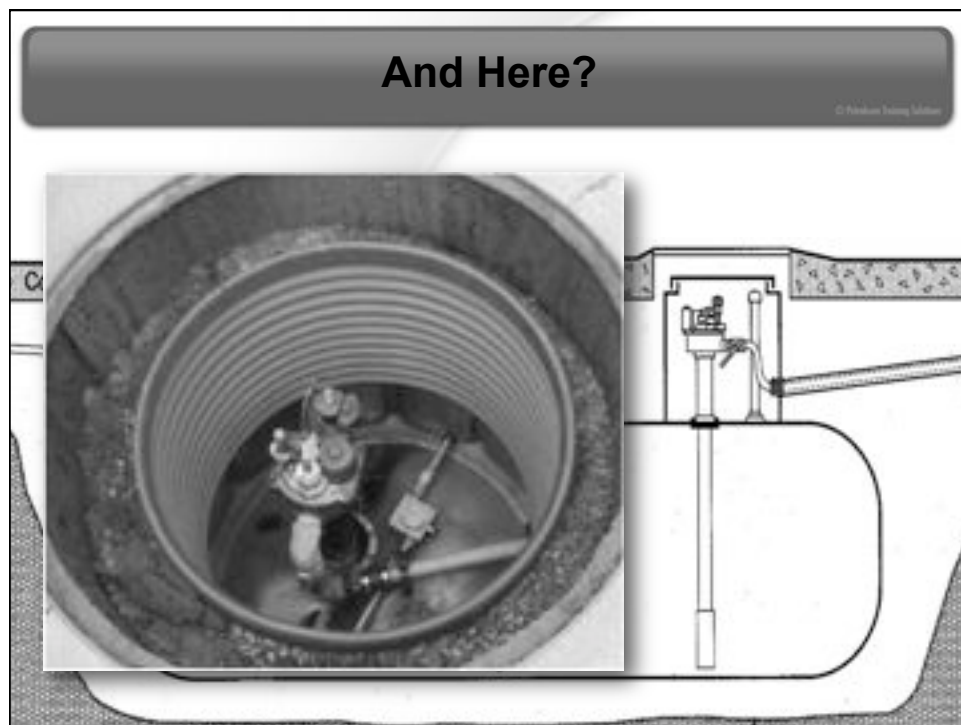
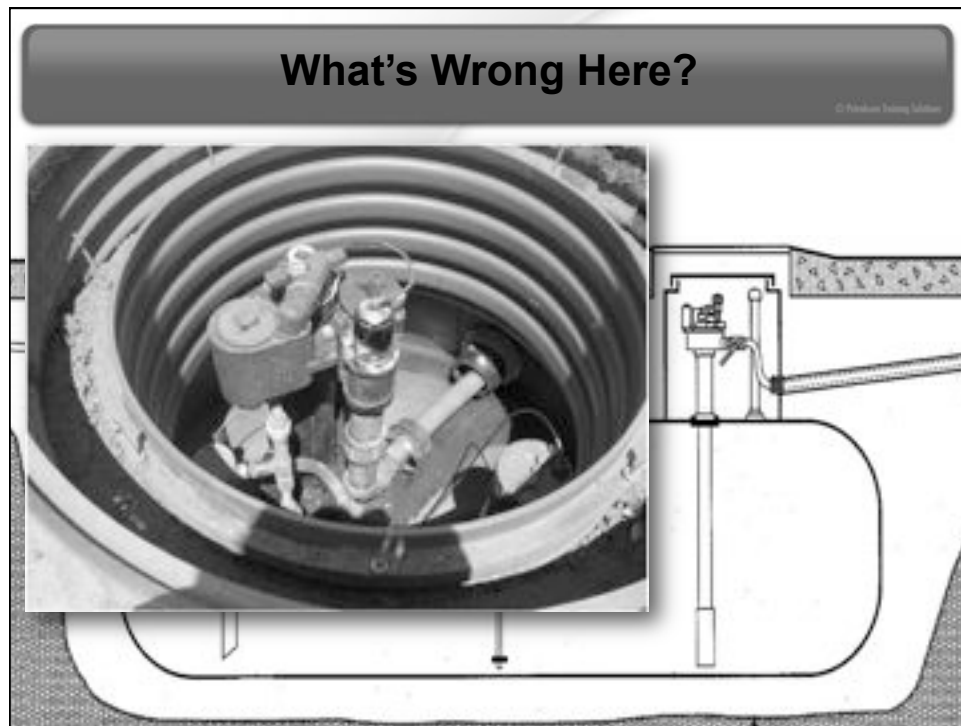


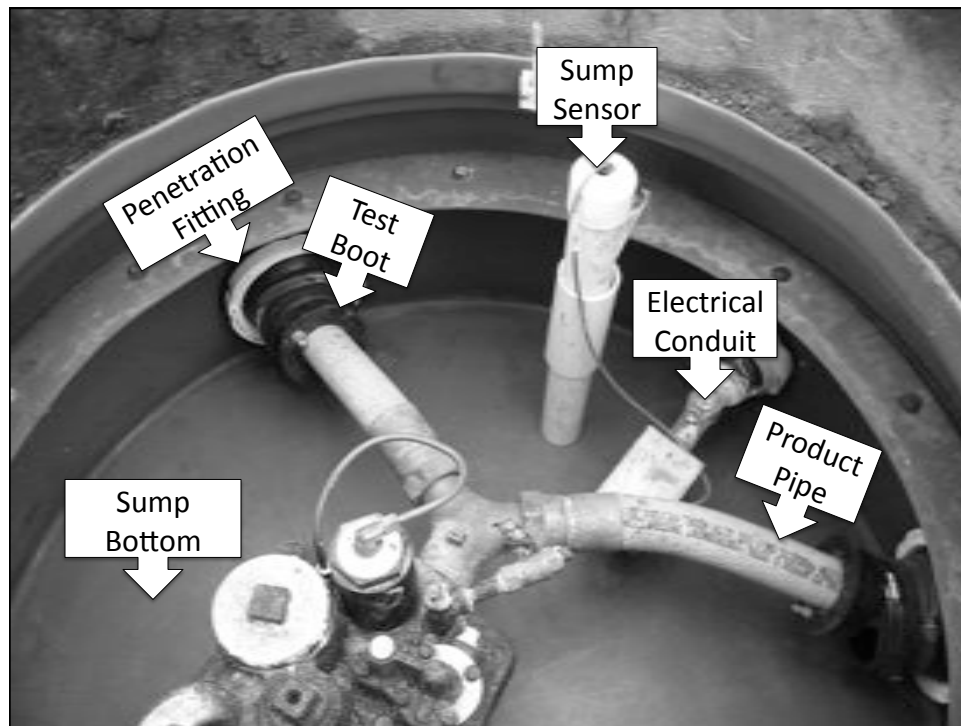


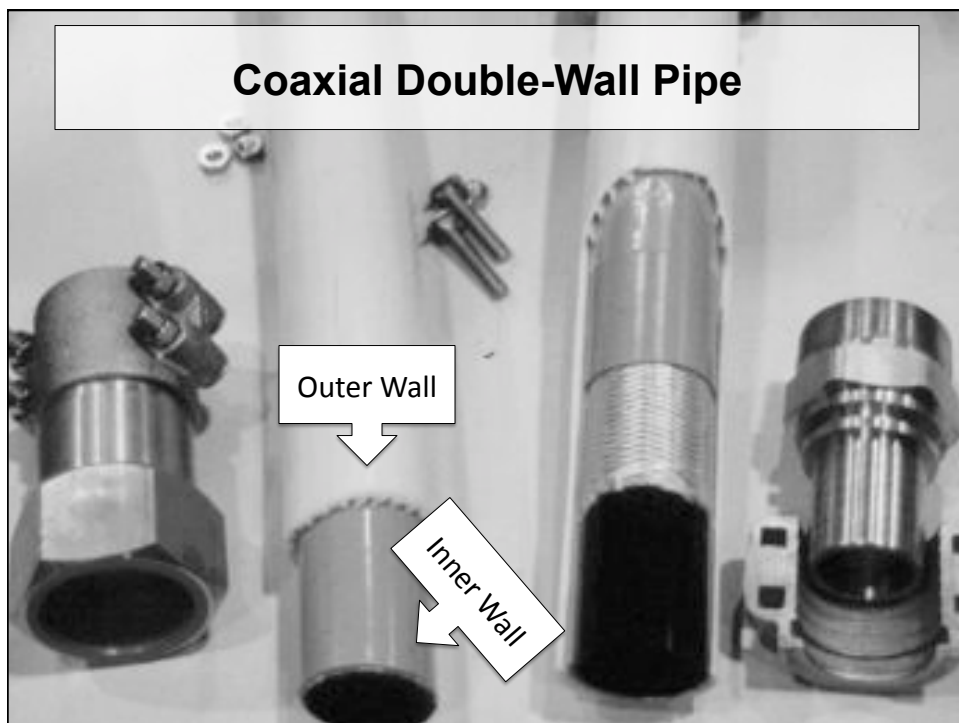
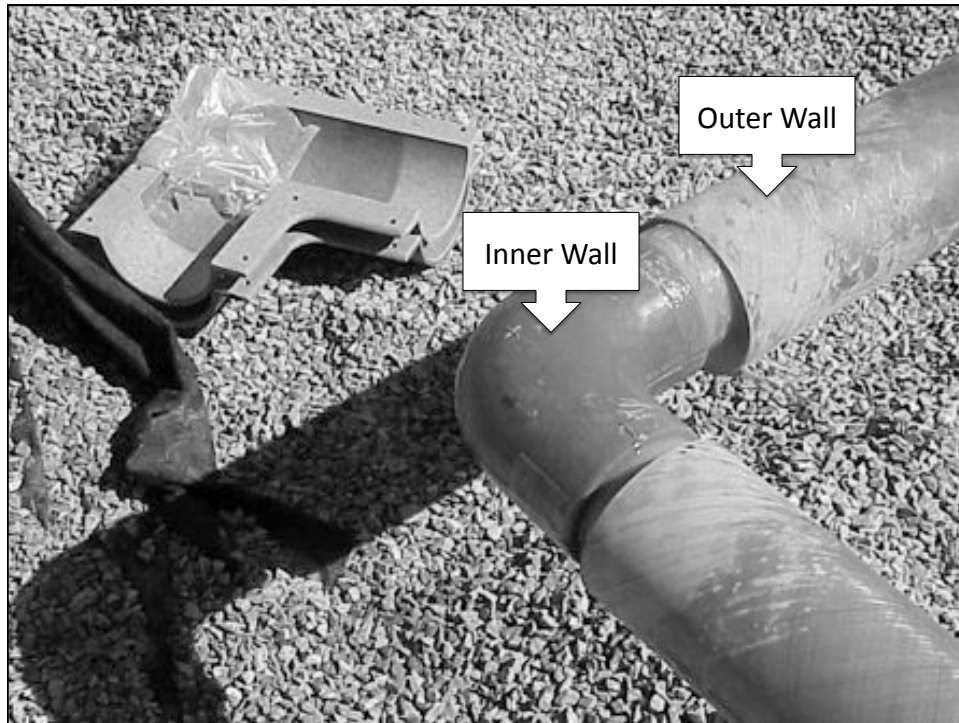
Secondary Containment

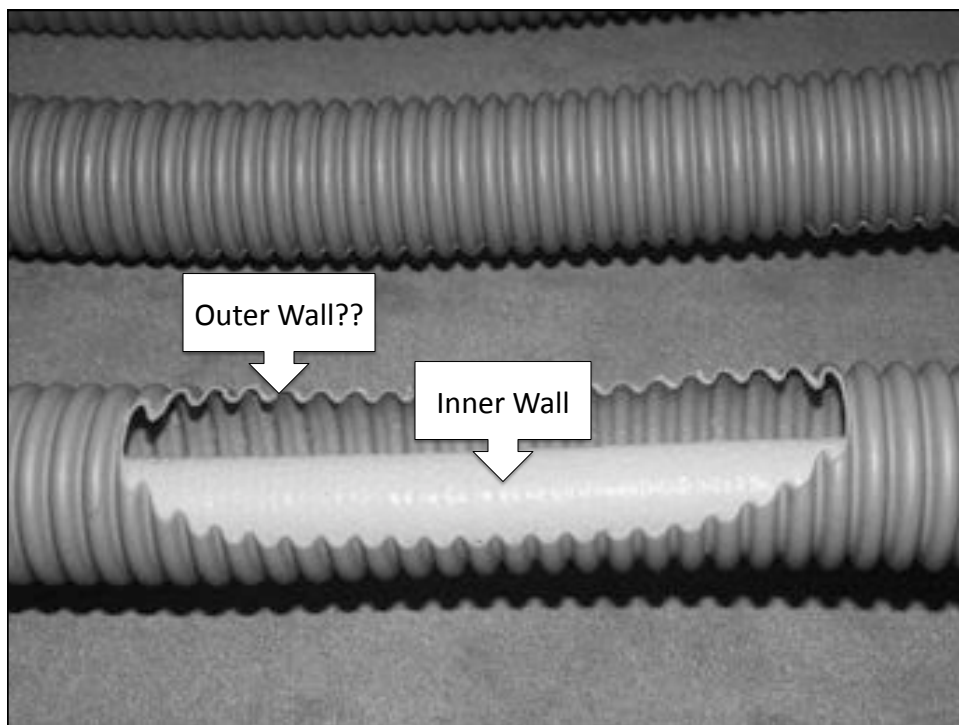
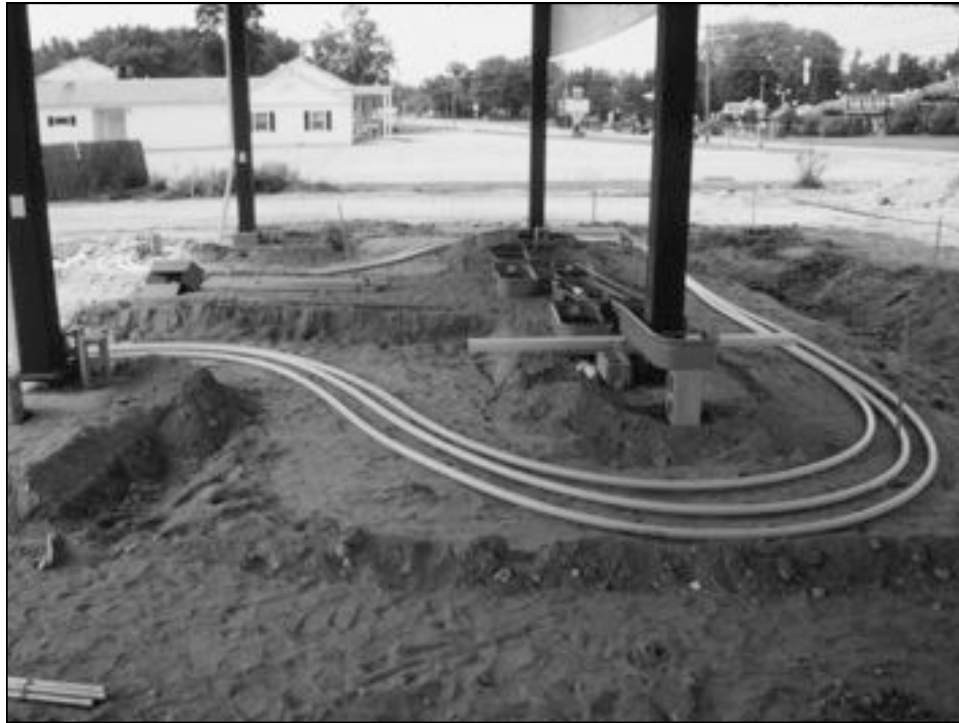
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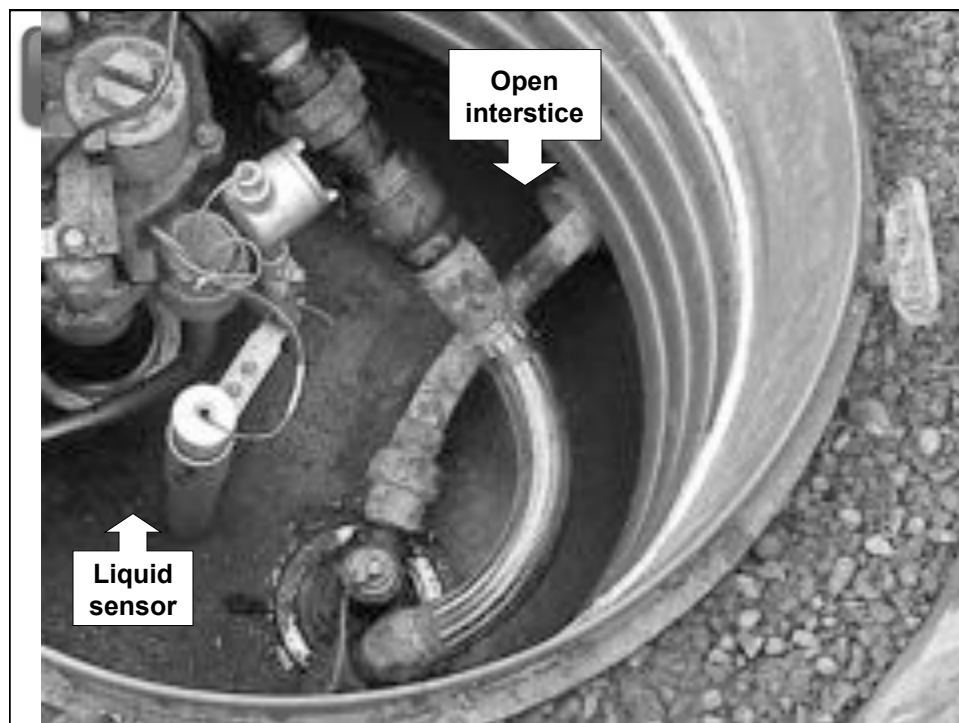
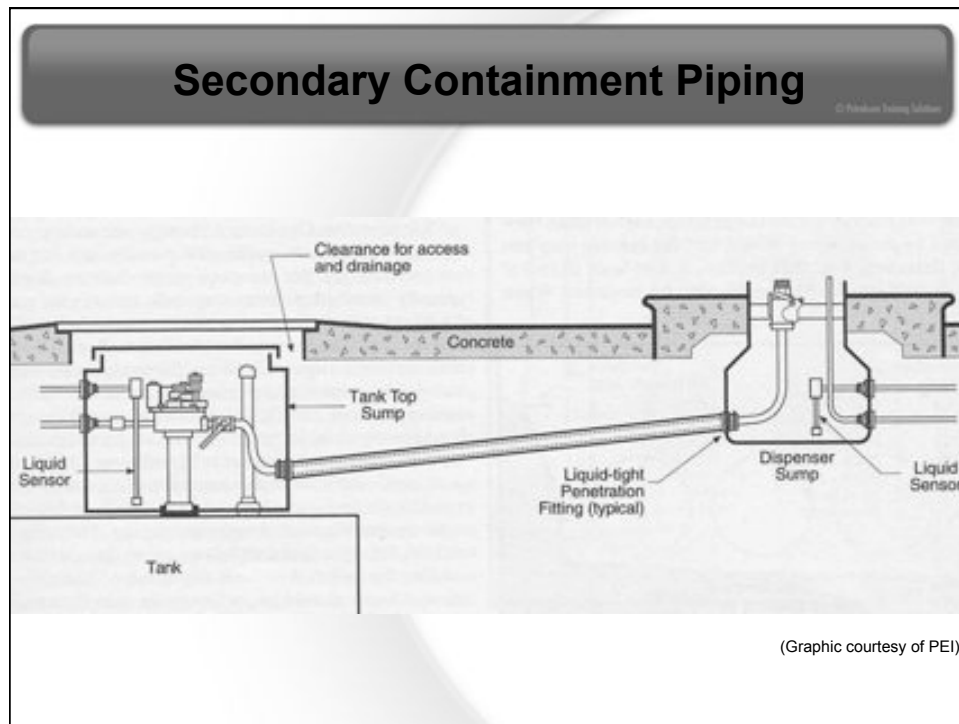


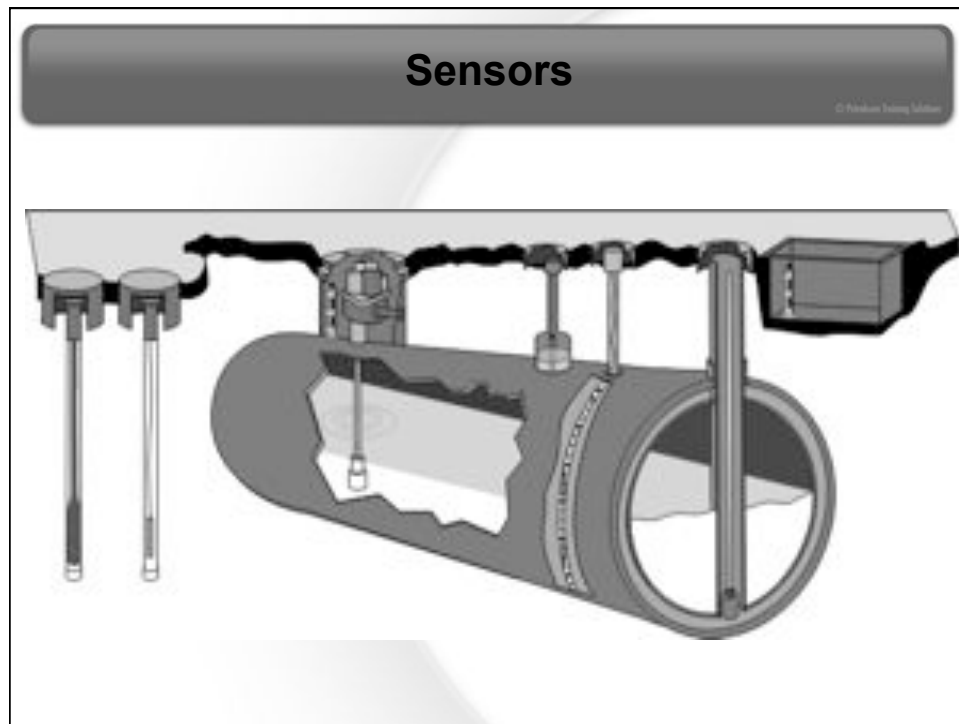












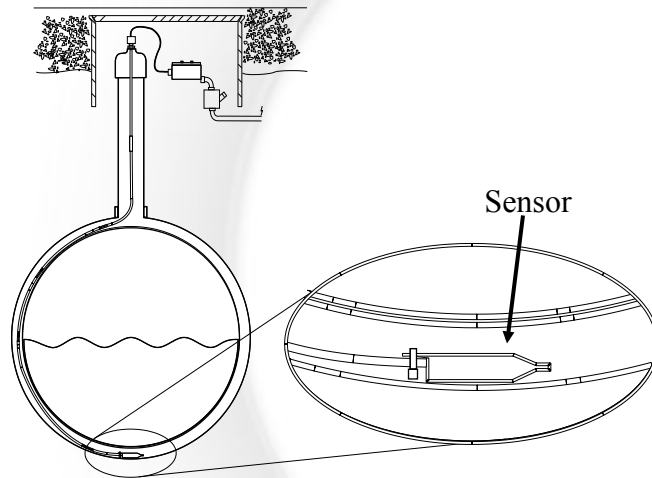
Interstitial Sensing Options

- Dry
 - Electronic
 - Float/Magnetostrictive
 - Optical
 - Conductive
 - Manual
- Wet
- Vacuum
- Pressure

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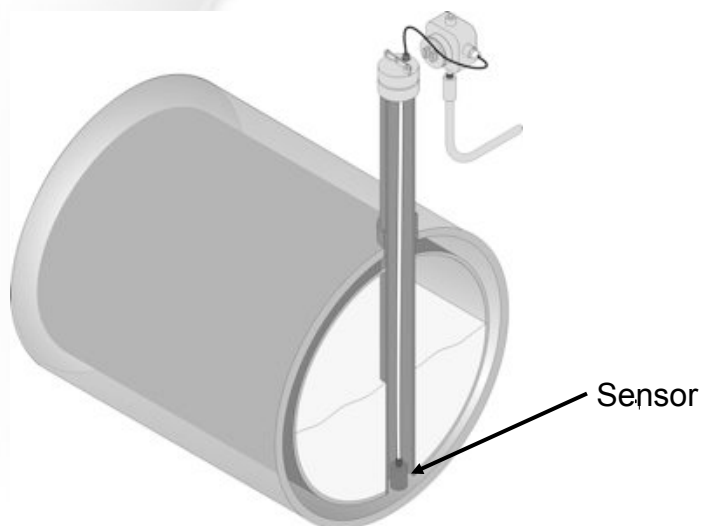
Dry Sensor - FRP Tank

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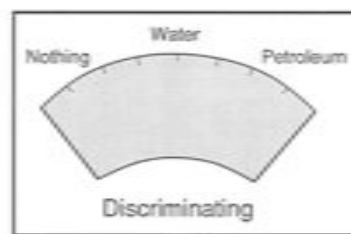
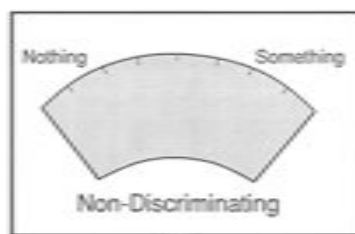
Interstitial Sensor – Steel Tank

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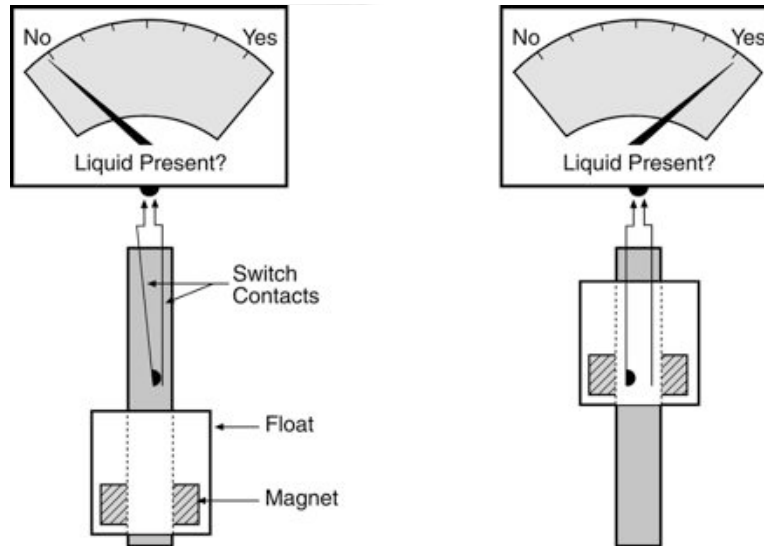




Types of Sensors



Liquid Sensor - Float









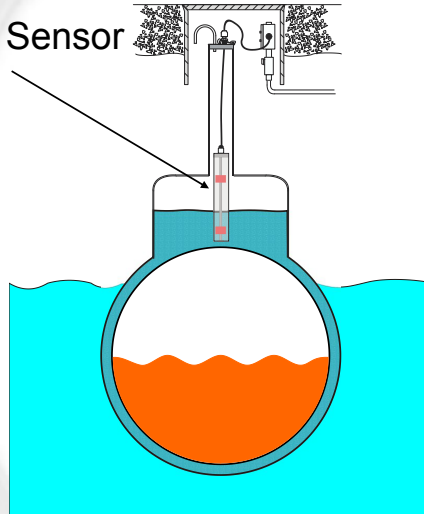
Manual Monitoring System



“Wet” Interstitial Sensor

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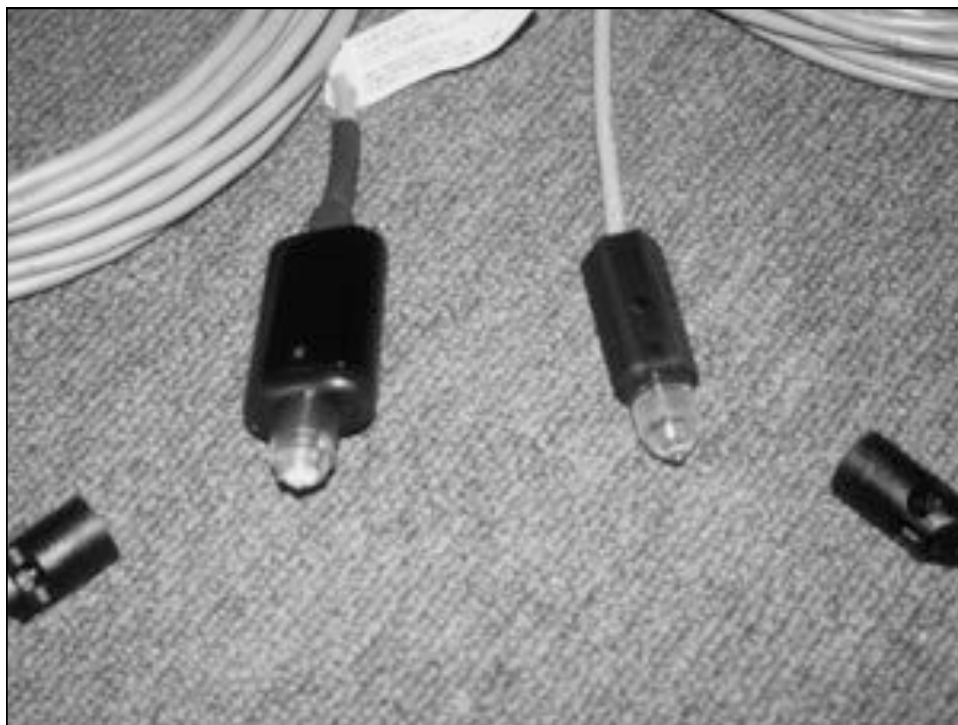
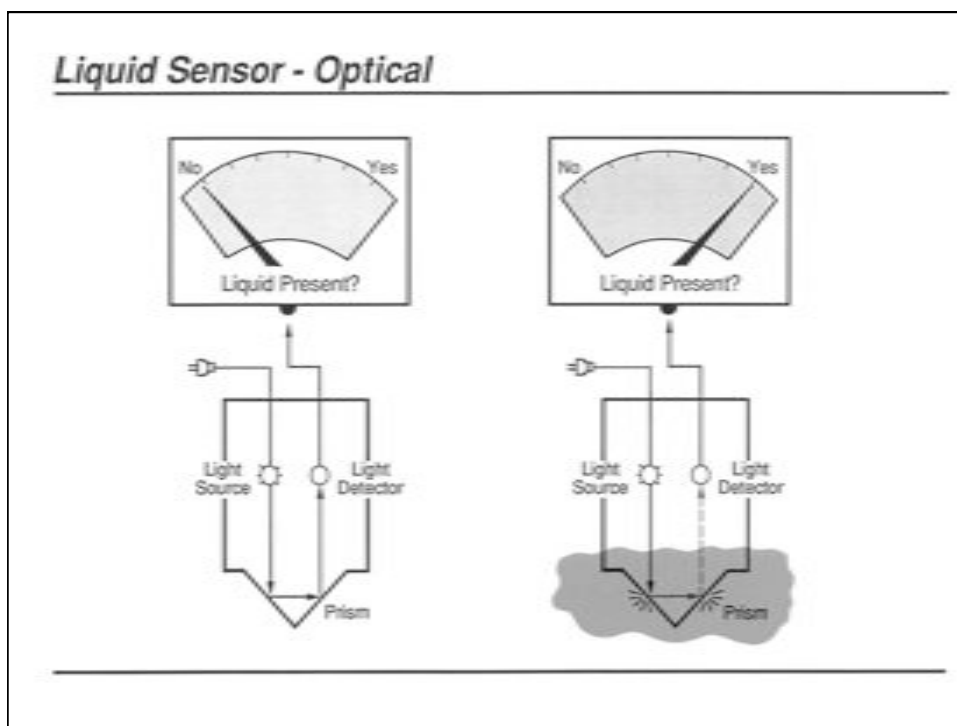
Hydrostatic Reservoir Sensor

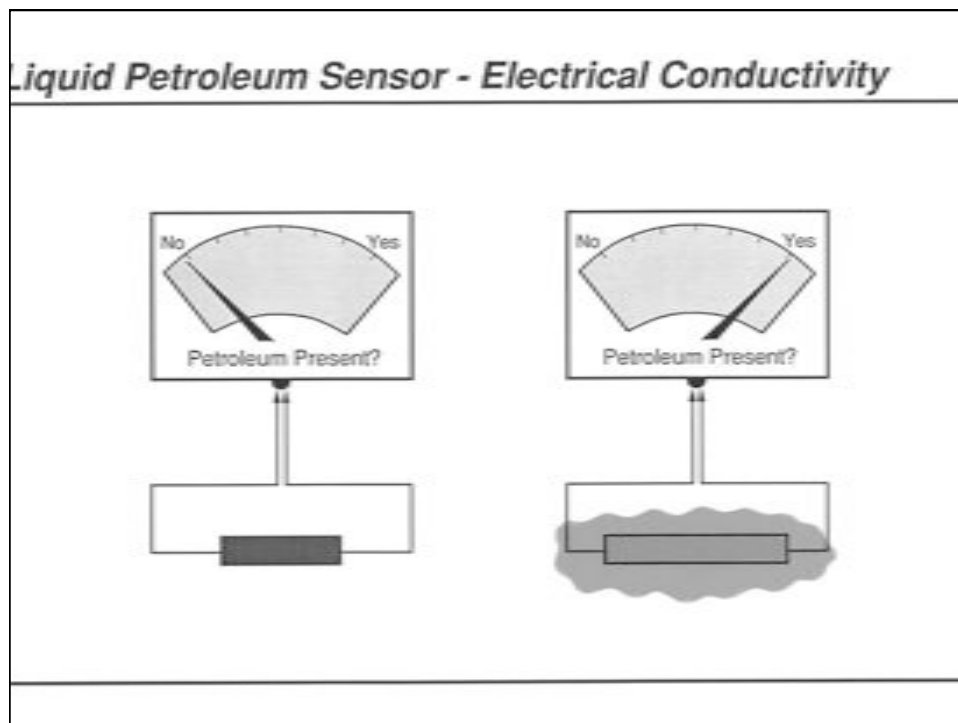


Wet Interstitial Sensor

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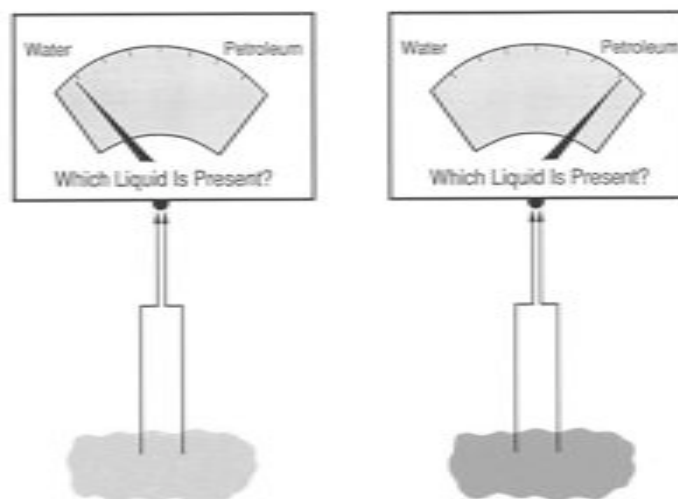


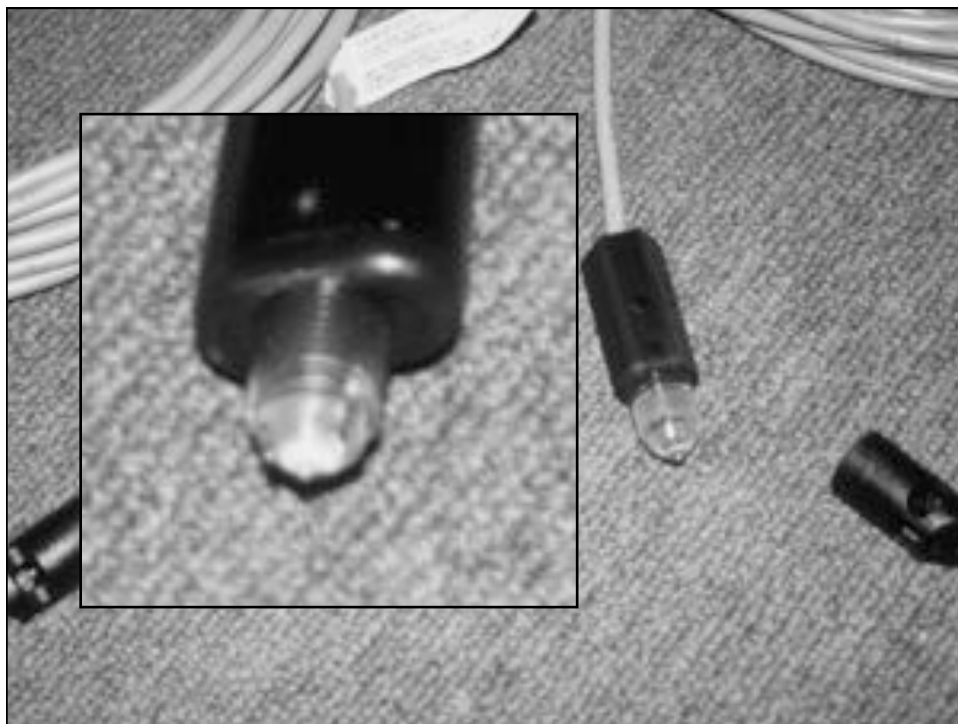






Liquid Sensor - Electrical Conductivity







Sensor Terms

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- **Float Sensor**-responds to presence of liquid-- fuel, water or both--in dry interstice
- **Hydrostatic Sensor**-responds to change in cumulative liquid level in wet interstice
- **Conductive Sensor**-responds to liquid interference on or between contact points in dry interstice
- **Optical Sensor**- responds to interruption of continuous light prism by liquid in dry interstice
- **Vacuum Sensor** (gauge) – responds to loss of vacuum in airtight interstice
- **Pressure Sensor** (gauge) - responds to loss of pressure in airtight interstice

Sensors: What They Can and Cannot Do

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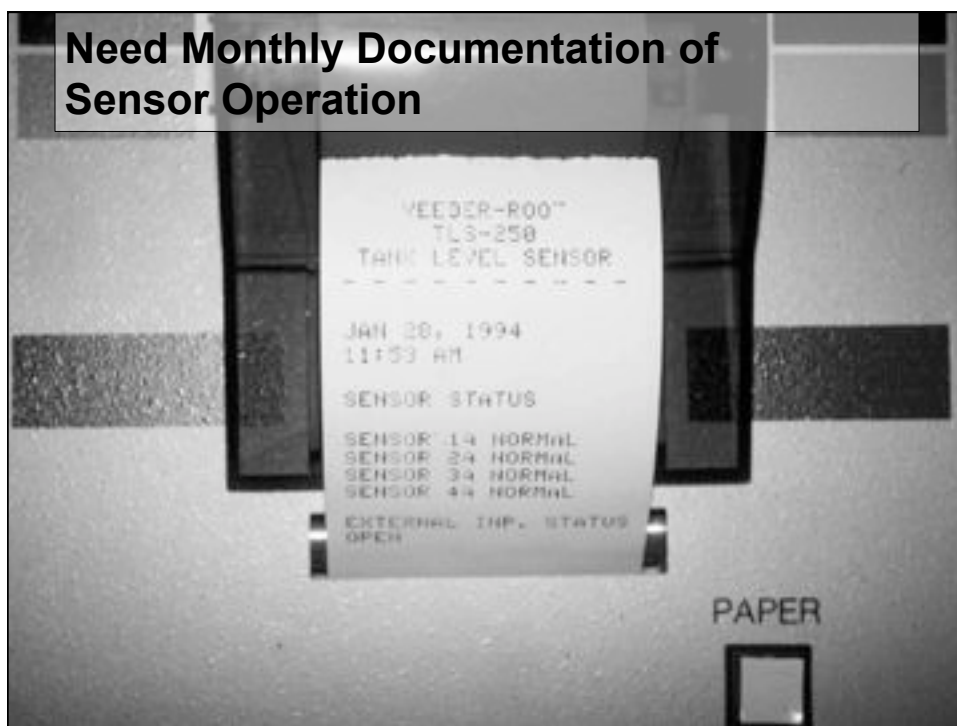
Sensor Type	Can detect introduction of liquid in tight interstice	Can detect breach in inner or outer wall of interstice	Can distinguish between product and water	Is compatibly with ethanol fuels
<i>Float, Discriminating</i>	Yes		Yes	E10 probably, E85 no
<i>Float, Non-Discriminating</i>	Yes			E10 probably, E85 no
<i>Hydrostatic</i>	Yes	Yes		Yes
<i>Optical</i>	Yes			Yes
<i>Conductive, Discriminating</i>	Yes			Yes
<i>Conductive, on-Discriminating</i>	Yes		Yes	Yes
<i>Pressure</i>		Yes		NA
<i>Vacuum</i>		Yes		NA

Monitoring



Most Sensors are Connected to ATGs**Sensors May be Connected to Dedicated Leak Detection Console**

Need Monthly Documentation of Sensor Operation



Manual Sump Sensor Check Log

Tank interstitial space check-----tank moisture che

1-2000	<i>OK Sump</i>	<i>1-2-00</i>	<i>at tank fill</i>
2-2000	<i>"</i>	<i>2-2-00</i>	<i>"</i>
3-2000	<i>"</i>	<i>3-2-00</i>	<i>"</i>
4-2000	<i>"</i>	<i>4-12-00</i>	<i>"</i>
5-2000	<i>"</i>	<i>5-15-00</i>	<i>"</i>
6-2000	<i>"</i>	<i>6-20-00</i>	<i>"</i>
7-2000	<i>"</i>	<i>7-15-00</i>	<i>"</i>
8-2000	<i>"</i>	<i>8-20-00</i>	<i>"</i>
9-2000	<i>"</i>	<i>9-15-00</i>	<i>"</i>
10-2000			

Problems

- Failure to respond to alarms
- Failure to respond to alarms
- Failure to respond to alarms
- Water in sumps
- Sensors not properly positioned
- Documentation of sensor operation not kept
- Leaky sumps and fittings

Interstitial Monitoring



Summary

- Interstitial Monitoring is the sum of containment, sensors, monitoring components
- Variety of materials, makes and models of each part
- Variety of monitoring principles

