



# UST Certification Refresher

November 13 & 14, 2014



# High Throughput Facilities

Finding leak  
detection  
blind spots



**Will any leak detector find all the possible leaks in this piping configuration?**



# Truck Stops & High Throughput

**Do We Have Leak  
Detection?**



# The Issues



- **Deep Bury**
- **High Volume Thruput**
- **Design**
- **Inspections**

# Deep Burial & Satellites



wiseGEEK



# Deep Burial

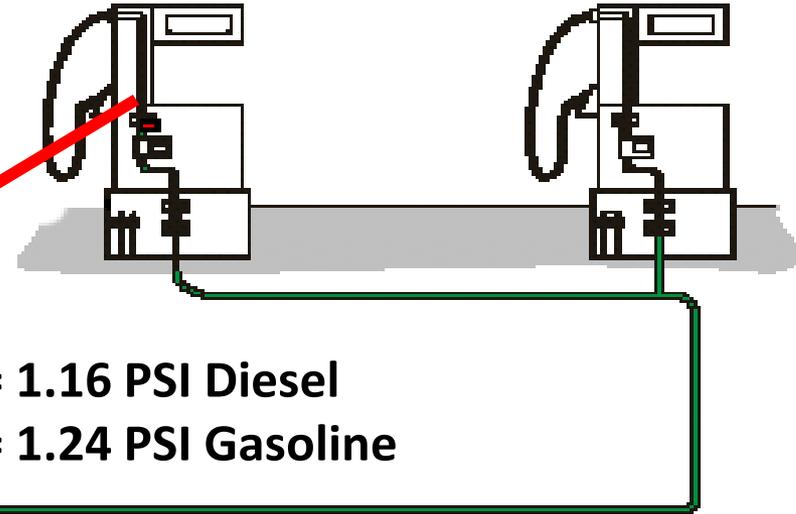
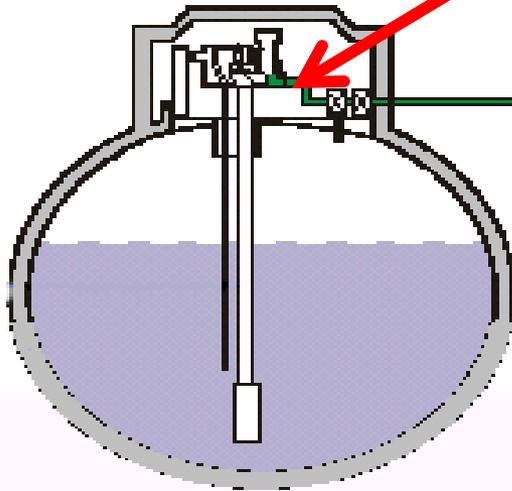
- Approximately 3' of elevation equals 1psi
- Sites have 10' of elevation change, OVER 3psi constantly of the Leak Detector
- Which Mechanical Leak Detectors will NOT be compromised by 3.41 Head Pressure?



# Head Pressure and Leak Detection

Diesel = .031 per inch  
Gasoline = .026 per inch

3ft= 1.16 PSI Diesel  
4ft= 1.24 PSI Gasoline



Measured from Solenoid to Packer O Ring



# Satellites





No Meter

One meter

Satellite line

Will SIR or an ALLD find leaks in piping between master and satellite dispenser?

Which dispensers are connected?

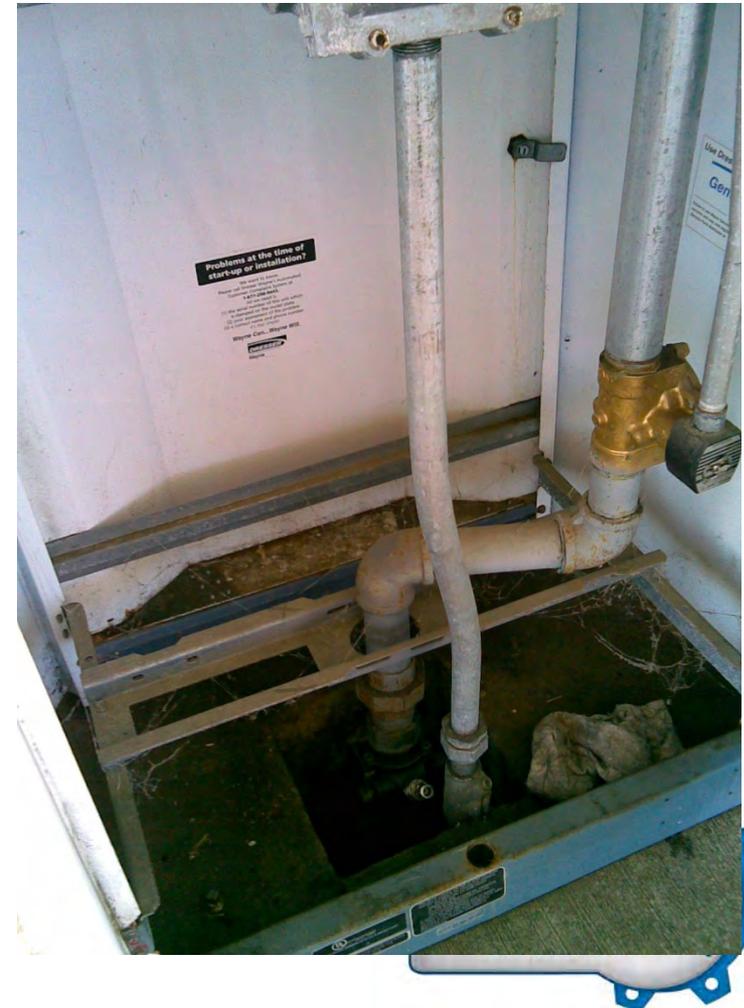


# Master/Satellite Dispenser Leak Detection

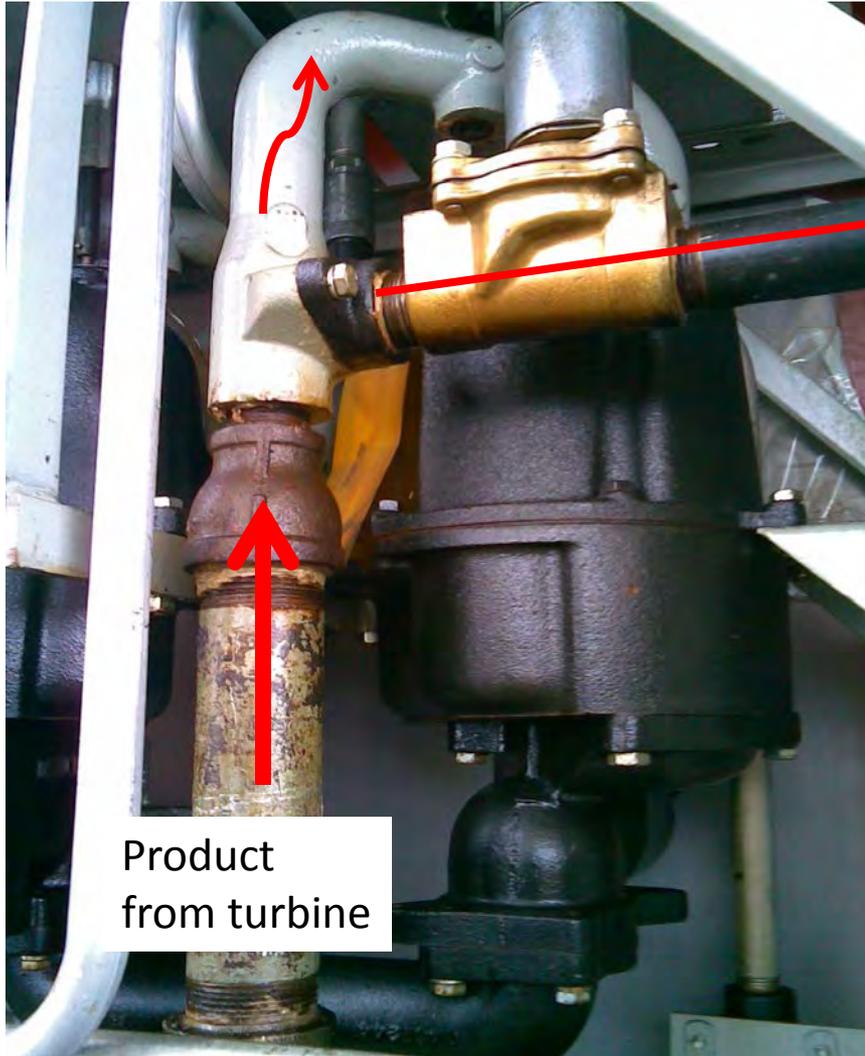


Solenoid valve on master dispenser is installed after "T" for satellite pipe

# Properly installed Solenoid Valves



# Improper Solenoid Installation



To the satellite dispenser

This solenoid valve location 'blocks' the ALLD from the satellite pipe run

# Satellite Line Tightness Test



Testing piping at this point does not include the pipe run to the satellite dispenser



# Testing Leak Detectors

- Must Test from FARTHERST dispenser!
- Old systems leak detection stopped at first dispenser solenoid—everything upstream is blind to leak detection
- New Systems have changed this!!



# Master/Slave Dispenser

Test from Master first.

- Test from Slave second.
- If Test passes from Master and not Slave, no protection to Slave.

Incomplete leak detection installation.



# Design and Satellite Lines

- How Much Line?
- What Type Of Pipe?
- Ball Valves vs. Gate Valves?
- Transition Sumps?
- Isolation of Piping?



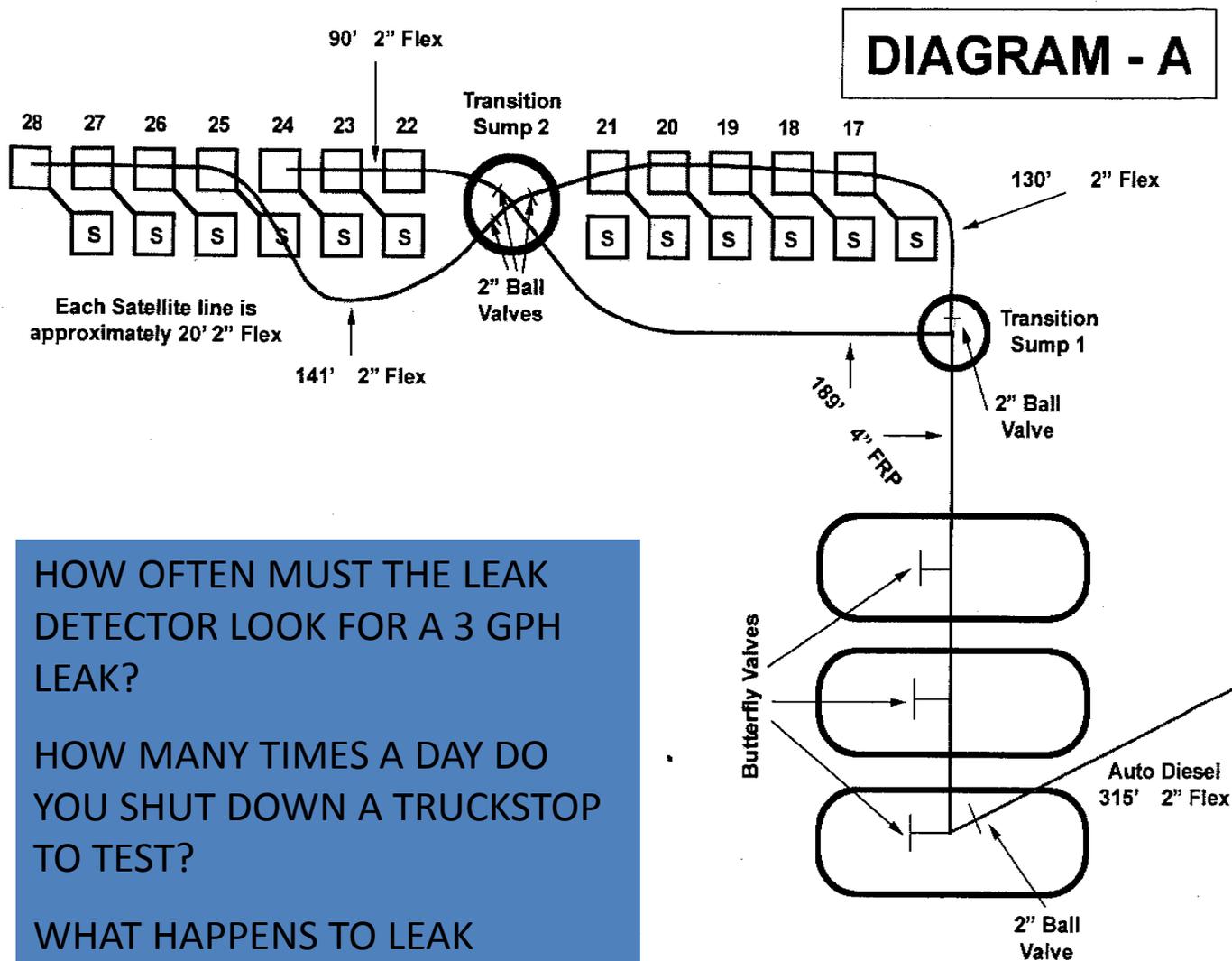
# Pipe Length and Gallons Chart

## CHART FOR COMPUTING VOLUME IN PRODUCT LINES

	Nominal pipe sizes*					
	1-1/4"	1-1/2"	2"	3"	4"	
	3.175cm	3.810cm	5.08cm	7.62cm		
10.16cm						
	Dia.	Dia.	Dia.	Dia.	Dia.	
Capacity						
Gal/Per Foot	.0636	.0912	.1632	.3672	.6528	
Liters/Meter	.7824	1.122	2.007	4.517	8.030	
Feet/Gallon	15.723	10.965	6.172	2.723	1.777	
Meters/Liter	1.278	.891	.498	.221	.114	

\* The internal diameter of different grades and types of pipe varies slightly from the nominal pipe size given. This variance, however, is not considered to be of sufficient significance to be a factor in the general use of this table.





**DIAGRAM - A**

Where do you place the leak detectors?

Where are the solenoid valves located?

Why do these questions matter?

HOW OFTEN MUST THE LEAK DETECTOR LOOK FOR A 3 GPH LEAK?

HOW MANY TIMES A DAY DO YOU SHUT DOWN A TRUCKSTOP TO TEST?

WHAT HAPPENS TO LEAK DETECTORS WHEN PIPE DIAMETER CHANGES?

# Volume, Volume, Volume

- **Veeder Root CSLD = MONTHLY THRU-PUT?**
  - **221,890**
- **OPW Eco System CSLD=THRU-PUT**
  - **130,000**
- **OMTECH CITLDS=THRU-PUT**
  - **154,195**
- **FRANKLIN Fueling CITLDS= THRU-PUT**
  - **257,818**

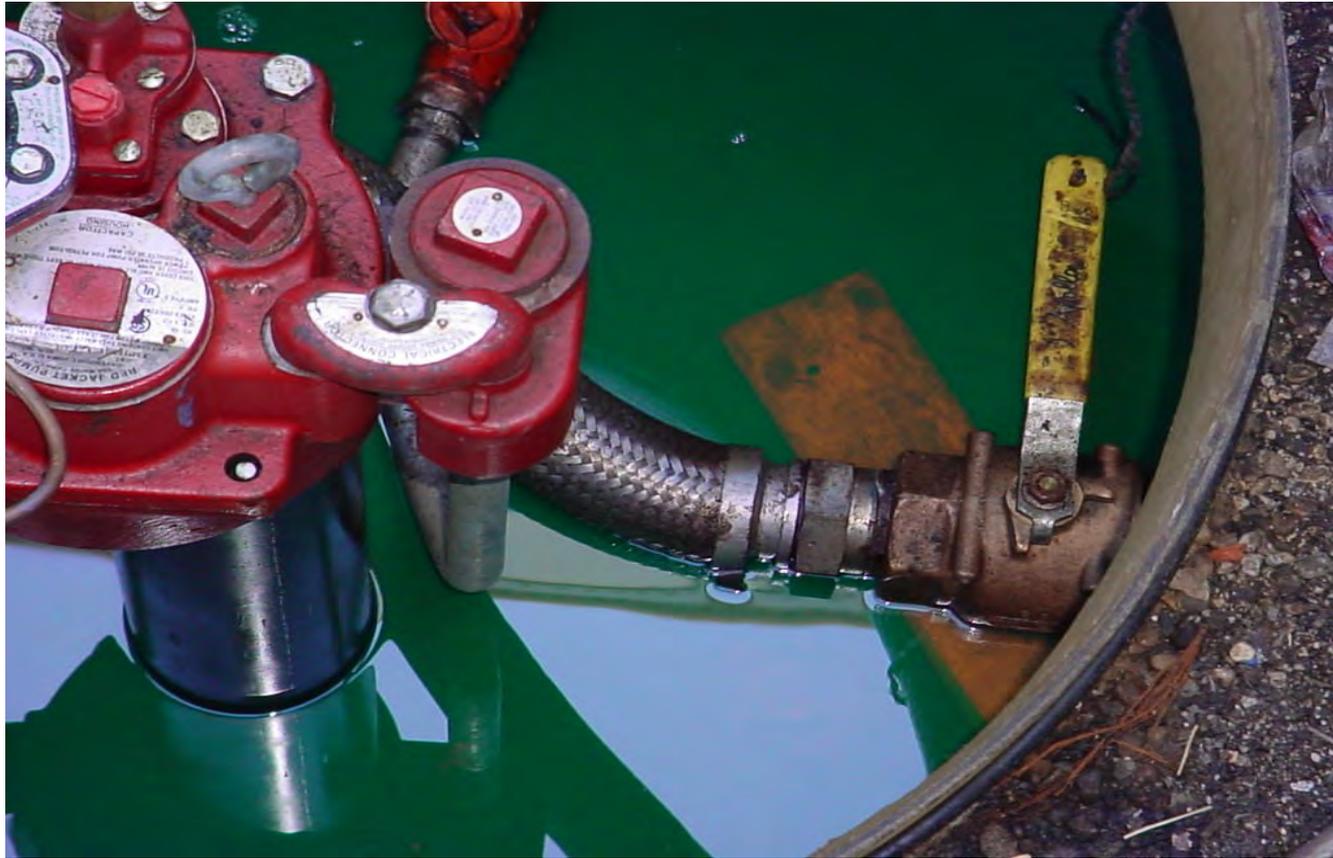


# What System Can Protect the Environment?

- Pumping 1 Million a Month?
- Pumping 2 Million a Month?
- Pumping 3 Million a Month?
- Pumping 4 Million a Month?
- Pumping 5 Million a Month?



# Past leaks, what is in the Closet?



# No way to isolate the pipe, or is it PIPES?

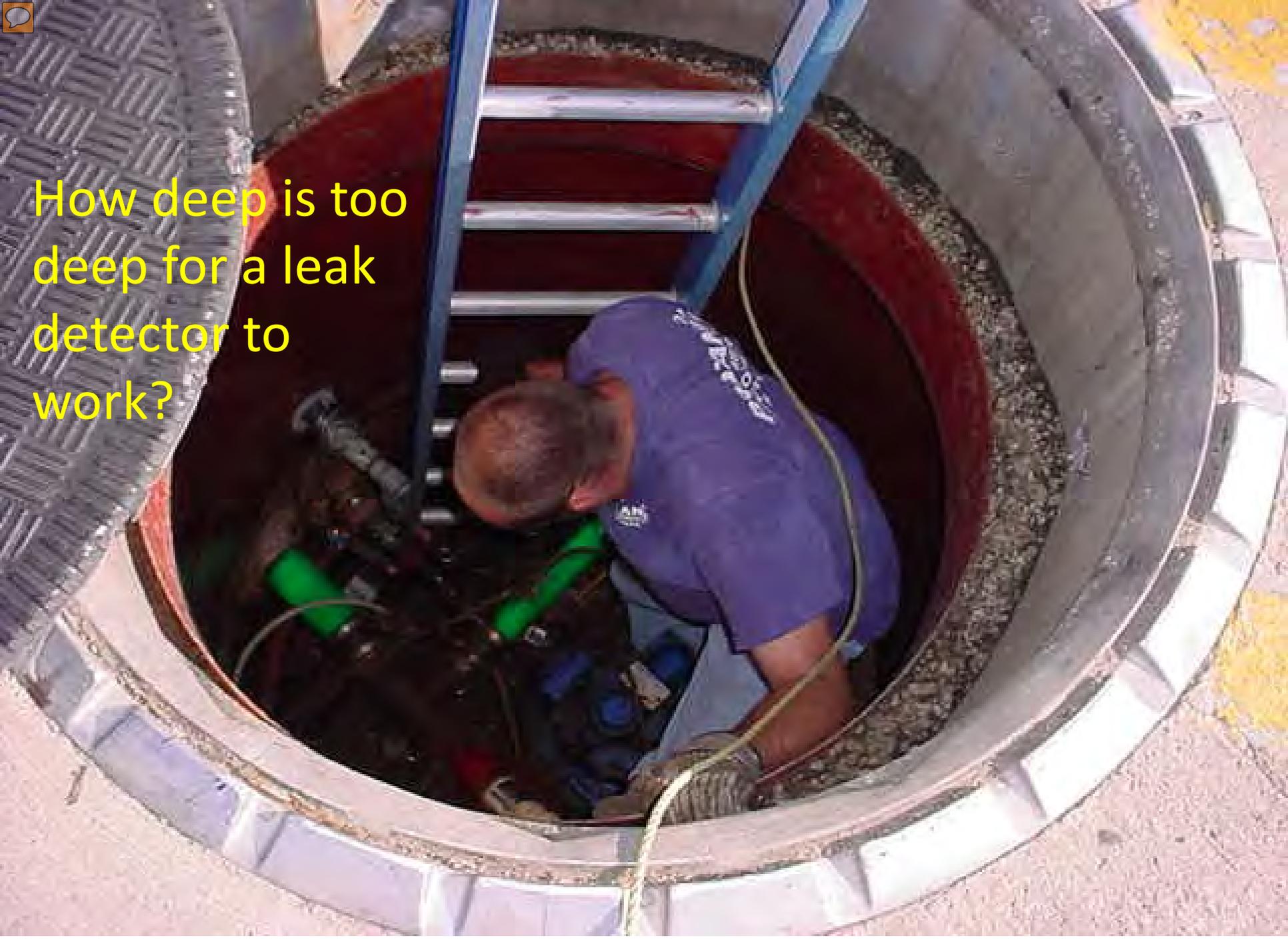


# BIG FLOWS –BALL VALVES???





How deep is too deep for a leak detector to work?

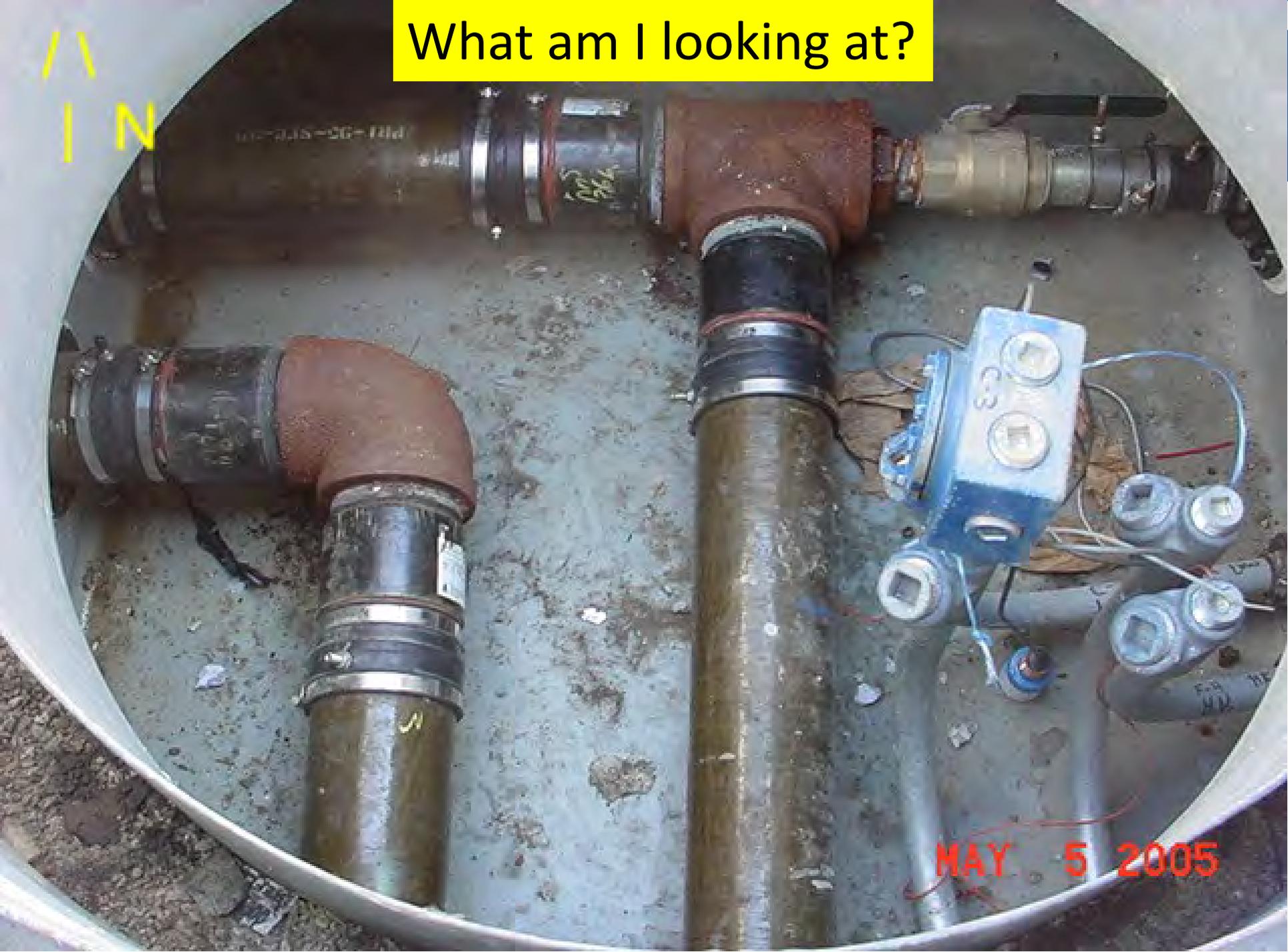


Where's the leak detector?



What am I looking at?

A  
I  
N



MAY 5 2005



**What am I looking at?**





04/27/2006

What am I looking at?

# Truckstops- Good Sump?



04/27/2006



Protection from a 3  
gallon per  
hour  
leak?



DEC 21 2003

Protection from a 3 gallon per hour leak?



Protection from a 3 gallon per hour leak?



Protection from a 3 gallon per hour leak?



Diesel

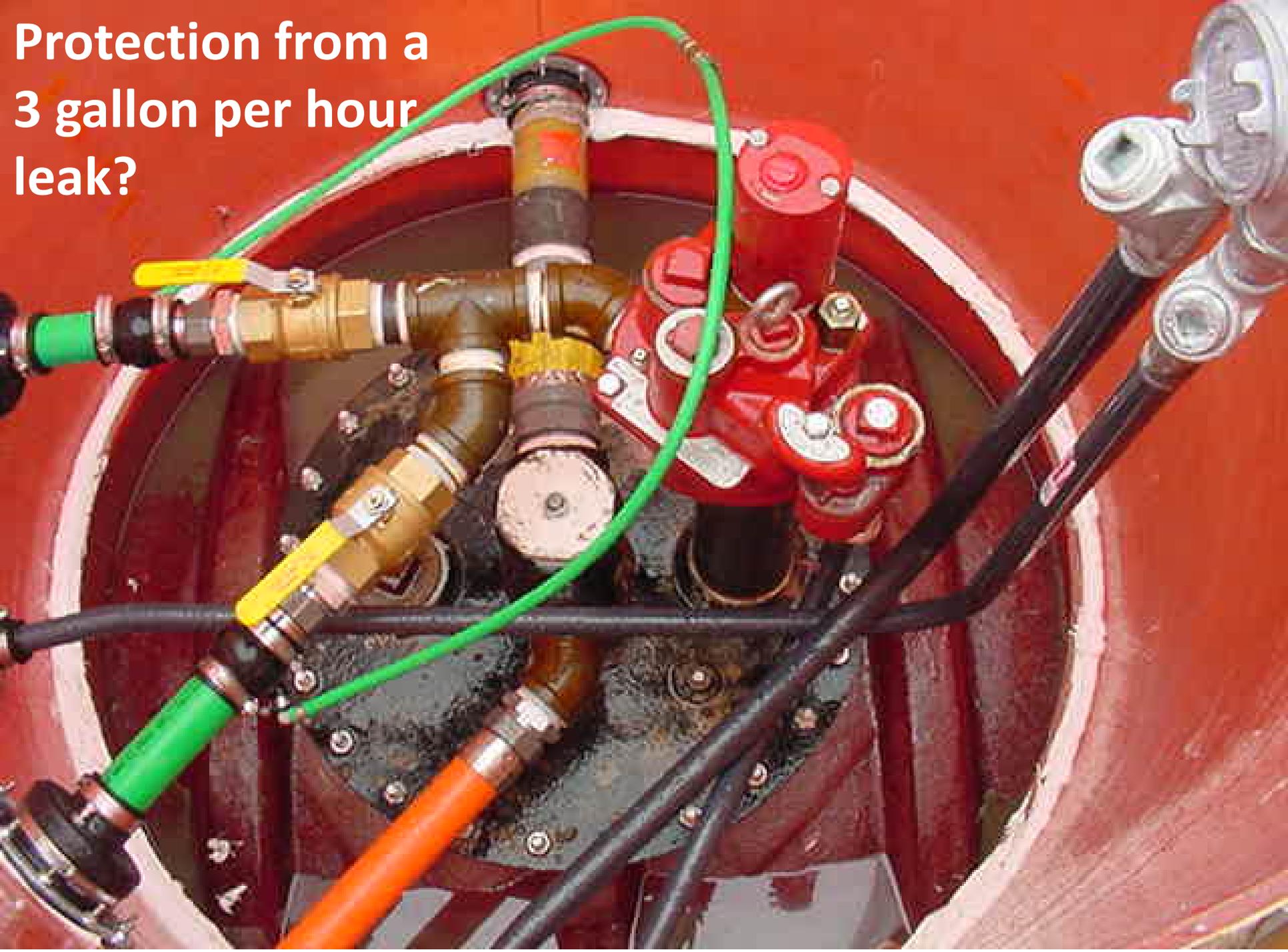


Ball Valve does not hold  
and needs to be replaced.

OCT 30 2003



Protection from a  
3 gallon per hour  
leak?





07/10/2007

# High Throughput Sites Conclusions

- Truckstops and high volume convenience stores have leak detection “blind spots”
- Inspectors and permit reviewers may not understand complex piping and multiple pumps and/or location of solenoids
- Not enough quiet time to test 3 gph every hour
- Monthly throughput can exceed third party tolerances
- Equipment not third party rated for application (pipe length/diameter, multiple piping types in one run)
- New systems should be built to be isolated and compartmentalized



# More Conclusions

- Deep Bury, Satellites and High Volume can Hinder ALL FORMS OF LEAK DETECTION.
- These factors can cause sluggish operation of Leak Detection Systems and in some case MISS the Leak Entirely!



# Possible Solutions

- Separate tanks to be able to Isolate portions (Design)
- Double wall pipe (Installation)
- Site Calibration ANNUALLY: Site Foot Printing (Inspection)
- 2 physical inspections per YEAR! 1 witnessed
- PEI- RP to help all who deal with them



# How Many Truck Stops in your state?

- *Questions to think about:*
  - *Last time Inspected? (properly)*
  - *Type of Pipe or Pipes (hybrid piping: fiberglass + flexible plastic plus steel on one contiguous line?)*
  - *True throughput based on what measurement?*
  - *Satellites?*



# What can YOU DO, Inspector?

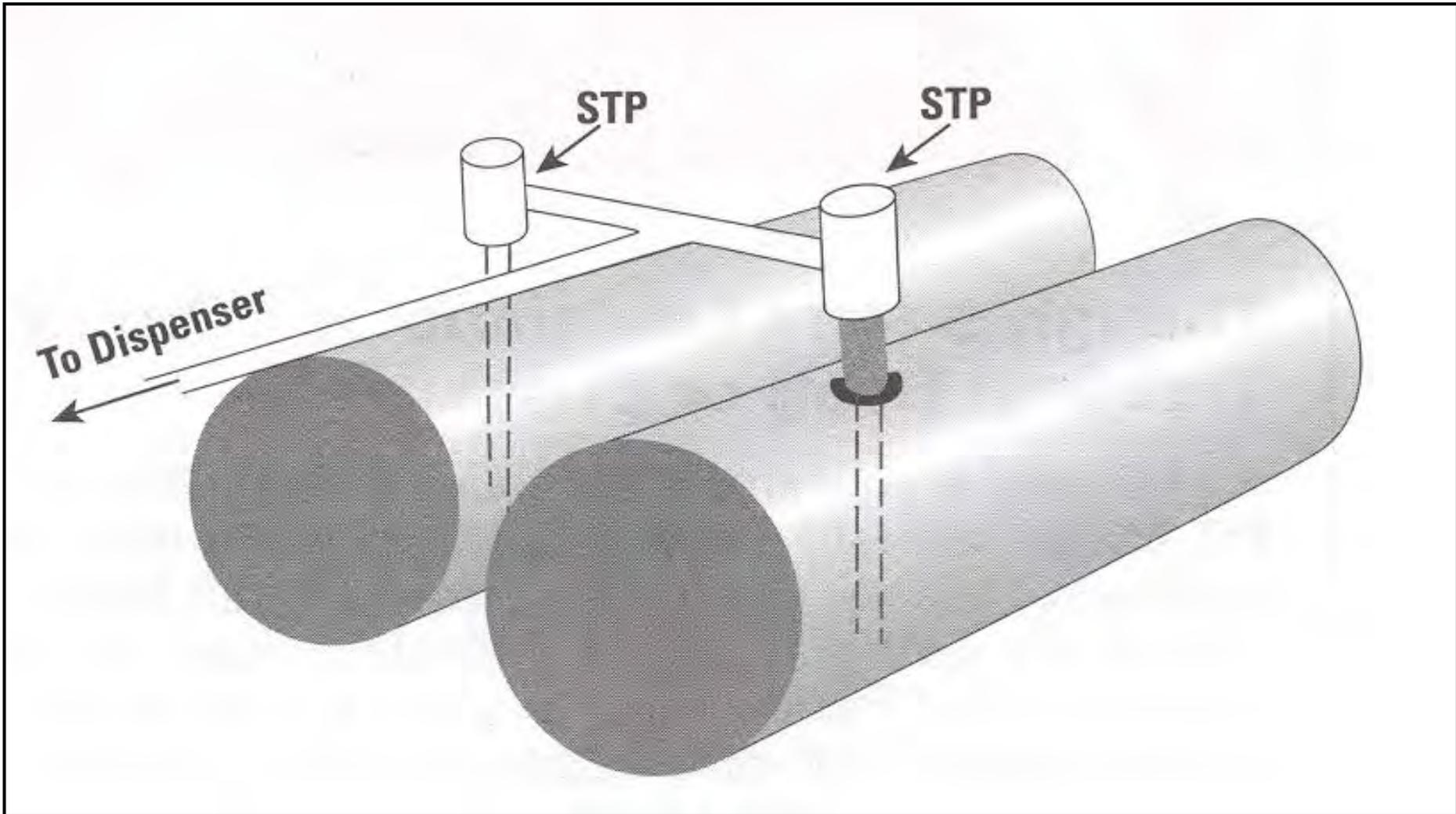
- Do some inspections, then do some more!
- Ask to witness a test
- Ask for diagrams
- Confirm throughput



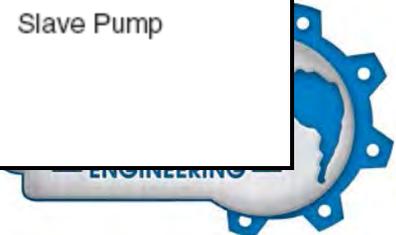
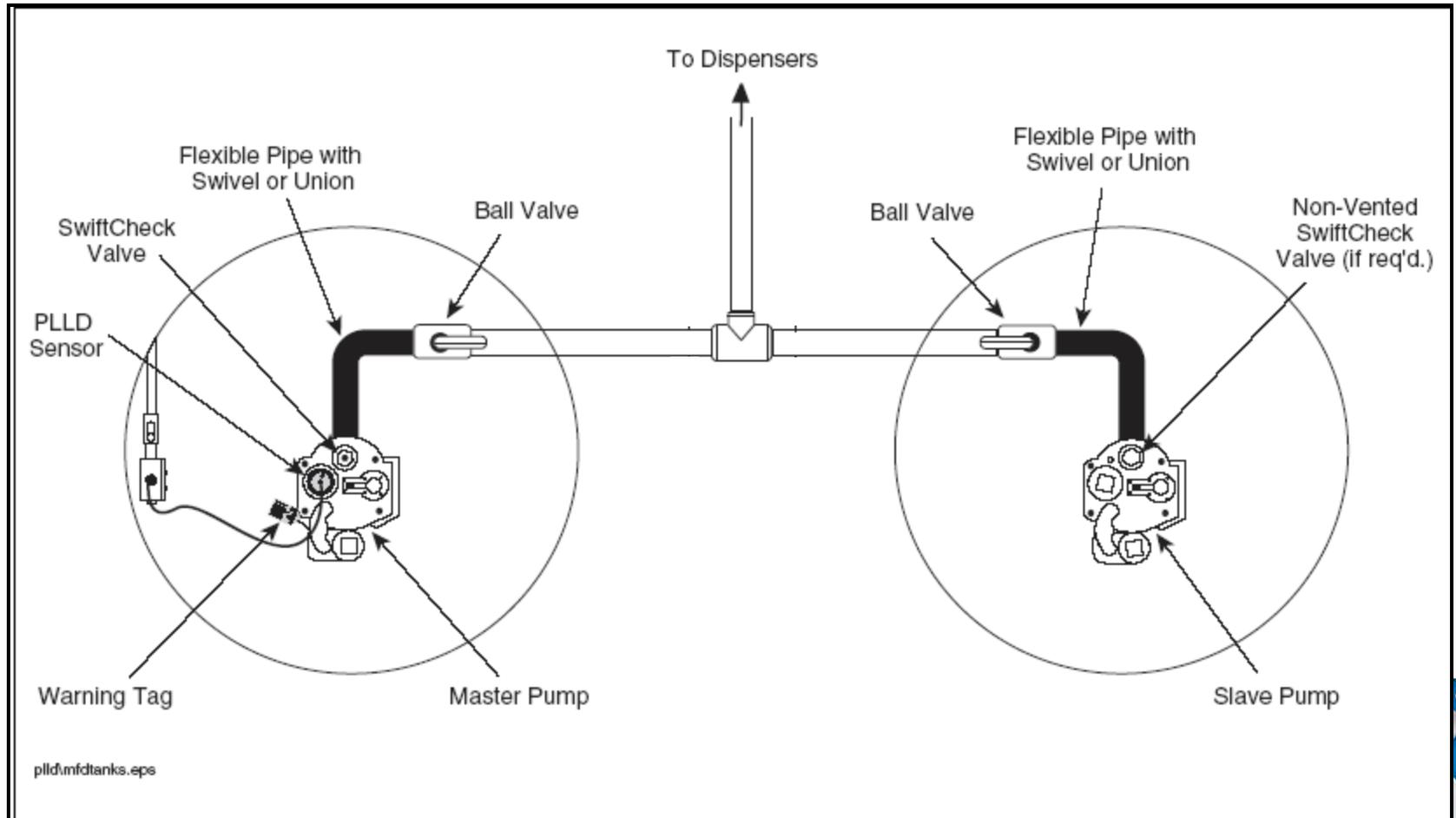
## Manifolding Lines Continued

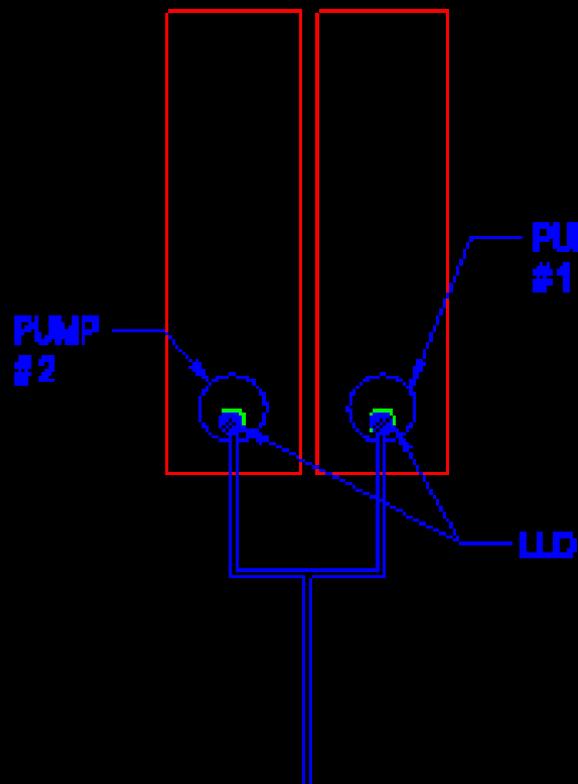


# Piping Manifold



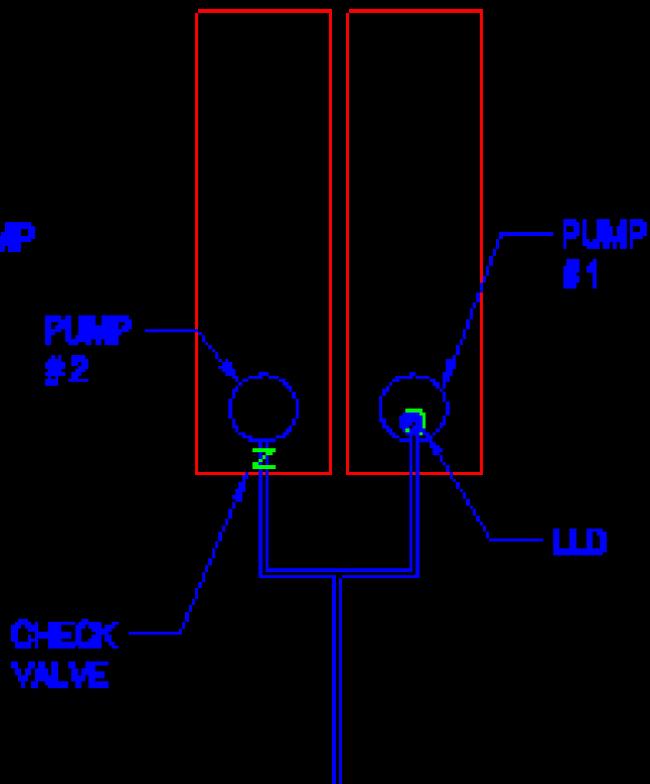
# Traditional Piping Manifold





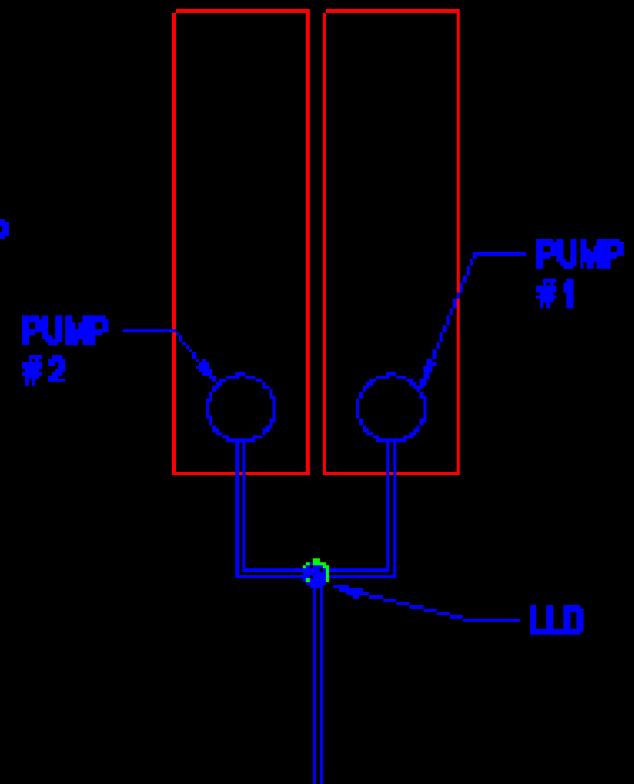
PIPE TO DISPENSING

DRAWING 1



PIPE TO DISPENSING

DRAWING 2



PIPE TO DISPENSING

DRAWING 3

# Manifold Piping with Two Turbines



# Manifold Pipe



# Manifolding

- Tank Manifold
  - Allows one pump to draw product from two tanks
  - Increases storage capacity
- Piping Manifold
  - Allows two pumps to service one product line
  - Increases flow rate if pumps operate together
  - Increases storage capacity if pumps operate separately

