Certified Contractor Presentation January 2020

MDEQ

Disclaimer

- The purpose of this class is to:
  - support discussion and learning on a number of difficult topics.
  - to go over MDEQ forms and the intent of the questions asked.
  - go over common issues with forms
  - for MDEQ to provide guidance regarding the forms
  - Sharing of information and tips.
- For all installation, testing, and training questions you should contact the manufacturer of the product to be installed or used for testing.

Where are we?

- 2016 EPA study found
- Diesel tanks:
  - 83% exhibited Moderate to severe
  - 90% of fuel samples taken in study contained ethanol
- Corrosion affected metal components in vapor space of tanks
- No gasoline tanks were studied.

- What about riser pipes? Tank Bungs?
- Expect more failures at tank tops…

ADEQ study 2016

Remember: Ethanol (Renewable fuels) were not widely used until after 2005. (15 years ago)

Tank Grading Scale

Grade	Description
A	**No issues** – Gelcoat intact and no visual cracking, degradation, deformation, or discoloration. The tank looks good.
B	**Minimal to Moderate issues** – Minor flaking, blistering, deformation, discoloration, or oxidation. Ideally less than 5% of the tank surfaces exhibit signs of degradation. Signs of aging are present. Structural integrity of the tank is unaffected.
C	**Moderate to Major issues** – Heavy flaking, blistering, corrosion, deformation, or minor cracks. Signs of degradation, stress, or structural integrity being effected. Ideally less than 50% of the tank surfaces exhibit signs of degradation. Further investigation is warranted.
D	**Severe issues** – Severe cracks or evidence of fuel egress, water ingress, or heavy degradation observed on more than 50% of the tank surfaces. Structural integrity has been compromised. Timely investigation is warranted.
E	**Tank unable to be assessed** – Too much product, fogging, or too little light.

For this project, Tanknology worked with ADEQ to provide general grades reflecting the observed condition of the tank.

What are We Finding?

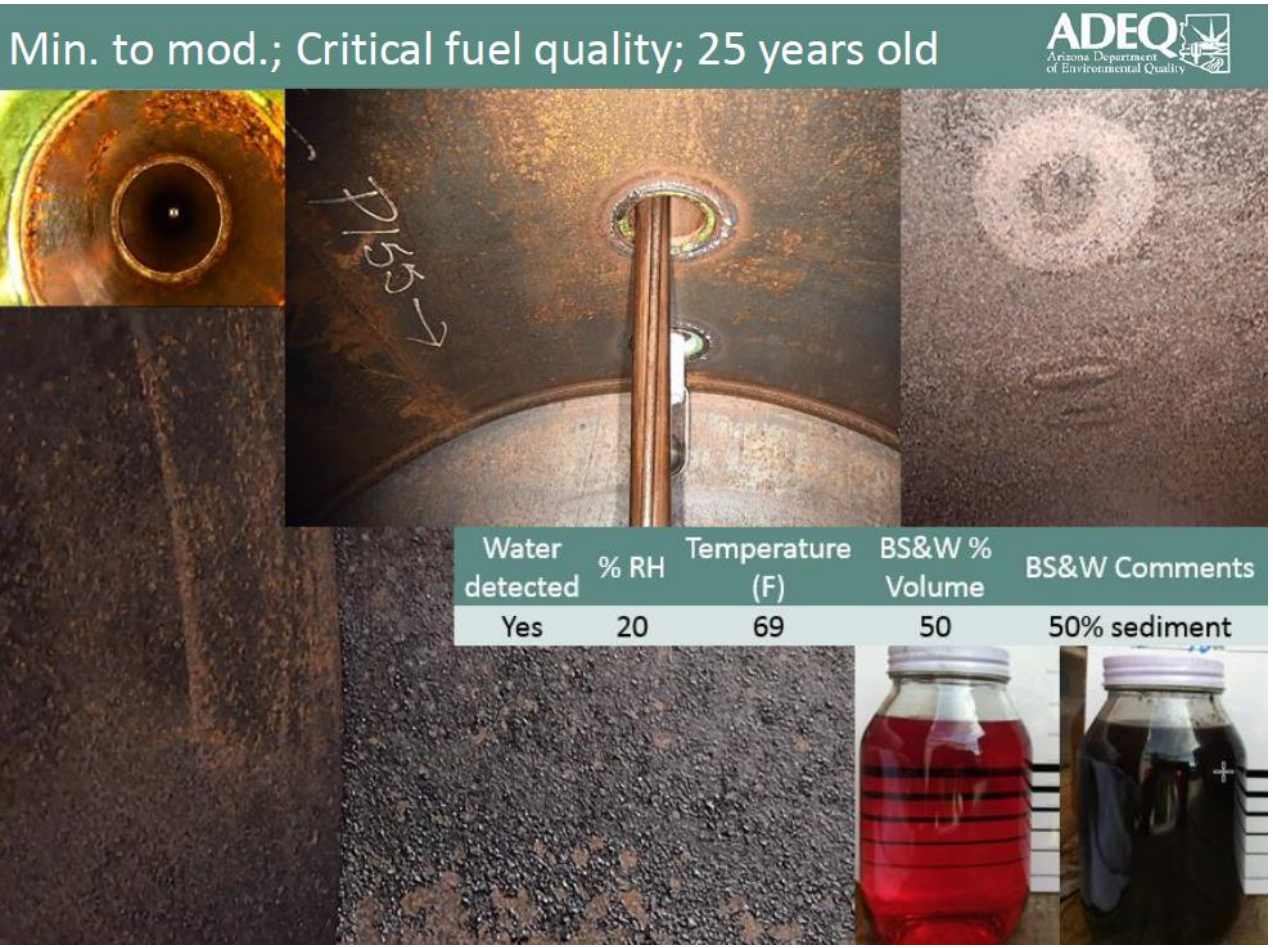
Currently, 79 tanks have been inspected:

		Tank Grade				
Fuel Type	**Number of Tanks**	**A**	**B**	**C**	**D**	**E**
Gasoline	31		48%	29%	23%	
Diesel	48	4%	86%	8%		2%

Construction	**Number of Tanks**	**A**	**B**	**C**	**D**	**E**
Steel (asphalt-coated or bare steel)	6		5	1		
Composite (steel/fiberglass)	7		5	2		
Fiberglass Reinforced Plastic (FRP)	66	2	46	10	7	1

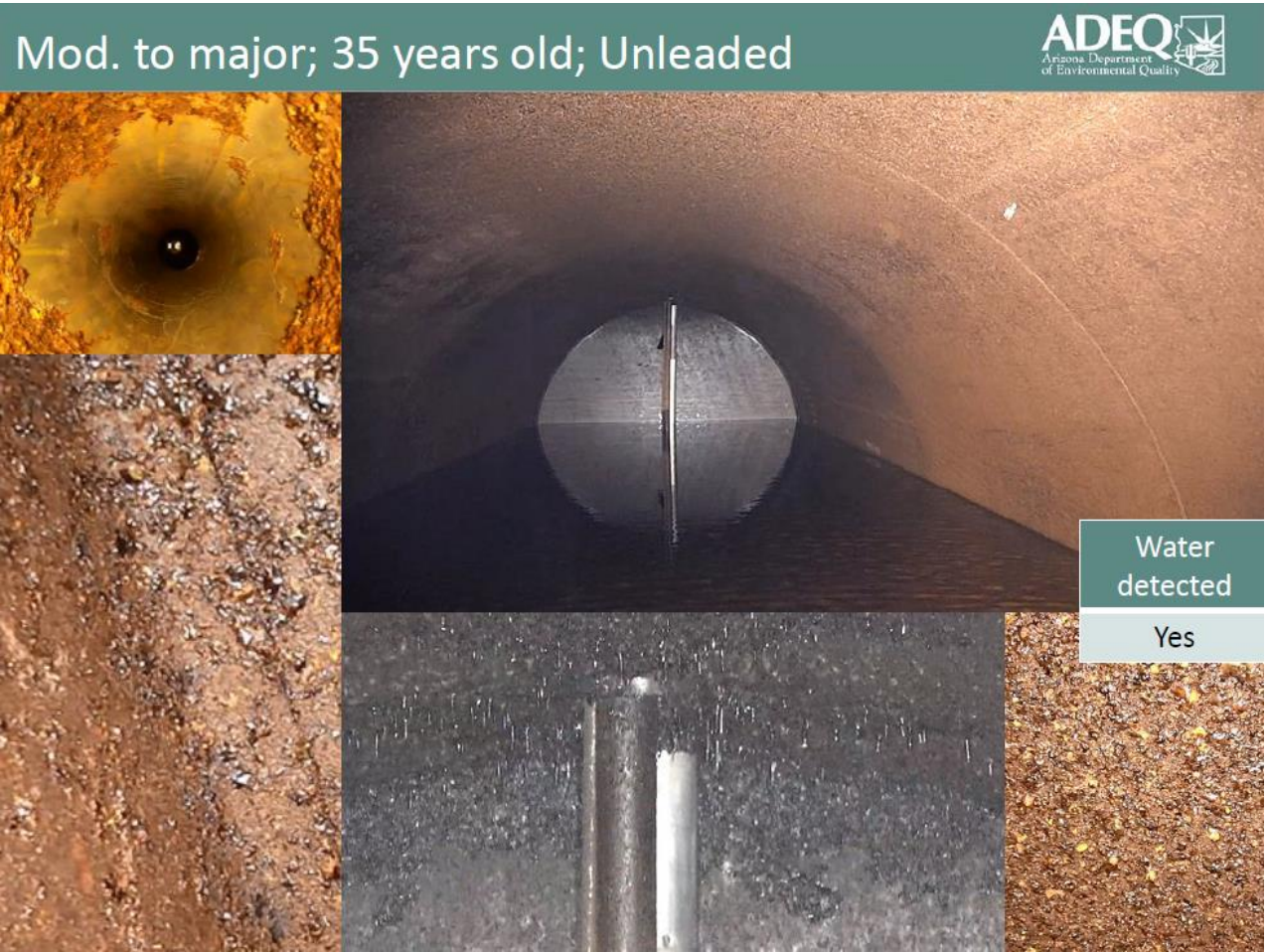
Average "age" of school-owned tanks is approximately 28 years since installation. The average of all AZ tanks is approximately 23 years since installation.

ADEQ example results

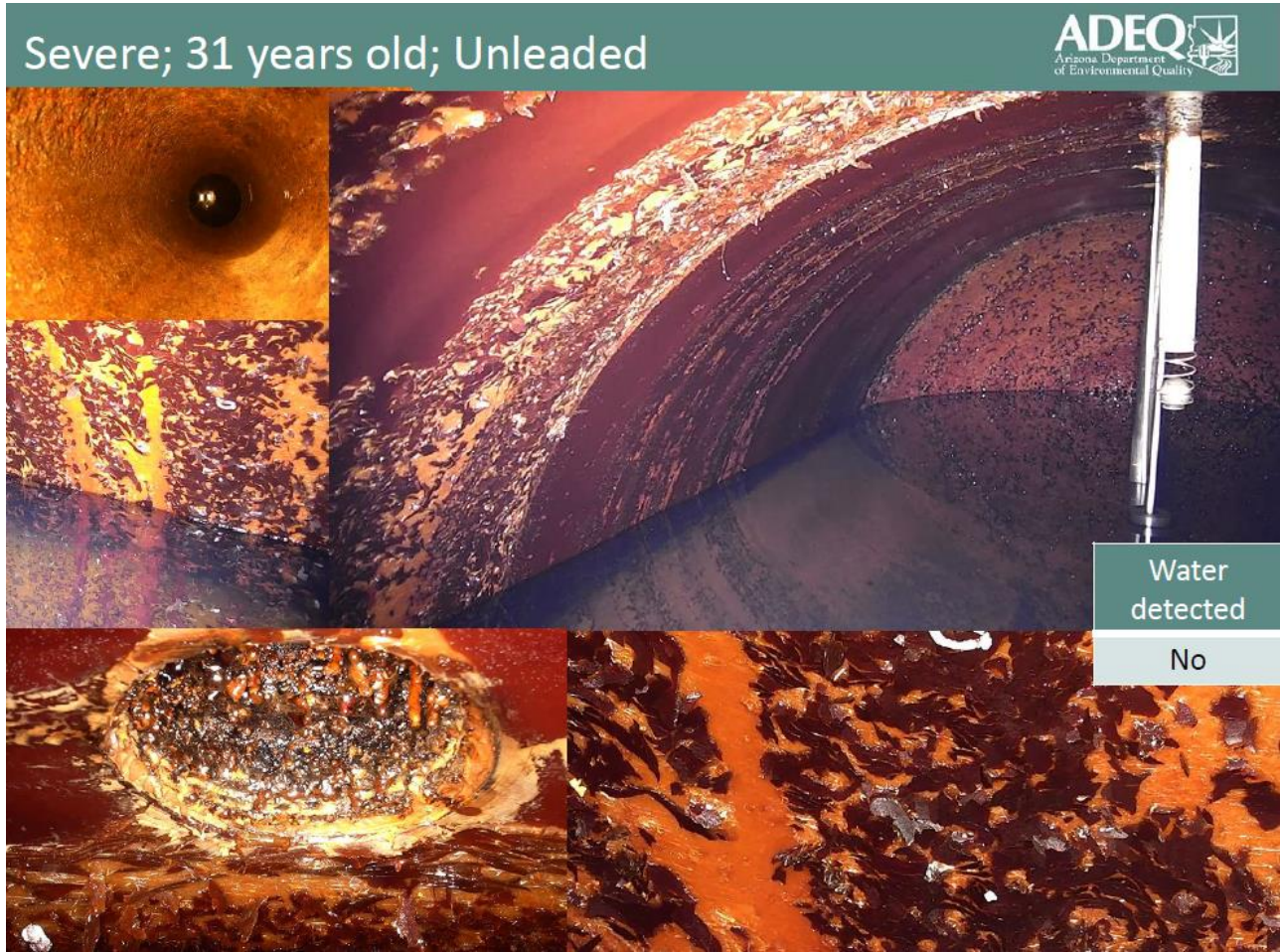


ADEQ example results

Steel Tank ~ 1981 install



Fiberglass ~1985 install



Where are we?

Battelle Study 2014

Suitability of LD technology for use in ethanol-blended fuel

Properties of fuel changed:

- Fuel is more acidic
  - Increases with ethanol content
  - Impacts all metal components
- Fuel Density is different.

- Produced some limitations to existing equipment
- Compatibility issues

Table 1. Summary of Fuel Property Data Collected*

Property	Gasoline (E0)	E10	E15	I16	E30	E50	E85
Specific Gravity (Dimensionless)	0.722	0.761	0.764	0.765	0.770	0.776	0.790
Density (g/mL) (15.6 °C)	0.722	0.762	0.764	0.766	0.770	0.776	0.788
Coefficient of Thermal Expansion ($5–30\ ^{o}C^{-1}$)	0.0010	0.0012	0.0011	0.0012	0.0013	0.0009	0.0010
Viscosity 25 °C (mm^2/S)	0.555	0.557	0.582	0.659	0.698	0.863	1.085
Conductivity (pS/cm)	192	12233	104722	5163	4321111	9204444	8304444
Acidity (% mass)	0.00053	0.0012	0.00093	0.0011	0.0012	0.0016	0.0015

*Triplicate samples were measured in triplicate for all properties and blends.

Why all the changes?

Battelle Study - 2014

Suitability of LD technology for use in ethanol-blended fuel

- Detection of water intrusion not as clear.
  - Primarily affects:
    - higher throughput sites
    - Sites where GW / fuel levels

  consistently in lower quadrant of tank

Table 2. Biofuel-Water Mixture (BFW) Phase Separation

% Water	E0	E10	E15	I16	E30	E50	E85
0.0	C	C	C	C	C	C	C
0.25	S	SS	C	S	C	C	C
0.5	S	SS	C	S	C	C	C
2.5	S	S	S	S	SS	C	C
5.0	S	S	S	S	S	C	C

C = Composite, SS = Semi-Separated, S = Separated Clearly; All at 25°C

Water adsorbed into fuel with no change in fuel volume.

What we once knew to work and work well for leak detection has changed.

Why all the changes?

- Fuel properties are needed.
  - Correct program parameters in ATG?
  - E10 is not regular anymore

- Verify correct program parameters with manufactures

Table 10. Suitability of Existing Leak Detection Technology for Ethanol-Blended Fuel

LD Category and Technology	Is the Technology Capable of Detecting a Leak/Water Ingress at the Regulatory Level?		Comments
	Low-E (up to 15%)	High-E (51 to 83%)	
VOLUMETRIC METHODS			
Automatic Tank Gauge (ATG) Systems^			
Magnetostrictive Probe*			Fuel properties are needed; liquid level changes will most likely be detected. Water ingress detection may have limitations when traditional water floats are used.
Ultrasonic or Acoustic Methods (speed)			Fuel properties are needed; liquid level changes will most likely be detected. Water ingress detection may have limitations when traditional water floats or conductivity water probes are used.
Capacitance Probe	Gasoline-ethanol-water has unknown properties and therefore may not be able to accurately diagnose the extent of a leak. In addition, multiple liquid phases in a storage tank will make it difficult to derive an accurate dielectric constant for each observed phase. Although capacitance is being used in other LD technology categories, the traditional capacitance ATG probes are not expected to operate properly.		No longer commercially available; rarely used.
Mass Buoyancy/ Measurement System			Fuel properties are needed; liquid level changes will most likely be detected. Water ingress detection may have limitations when traditional water floats are used.
Statistical Inventory Reconciliation (SIR) Methods			
SIR – Manual			Comparing a change in condition using regularly collected data; assumes no changes in data collection process. Fuel properties are needed; liquid level changes will most likely be detected.
SIR – Data from ATG			
Methods of Release Detection for Piping			
Pressure Decay			Dynamic methods require fuel properties (coefficient of thermal expansion, viscosity) to calculate or compare against a threshold; properties should remain constant in a given piping system, so if known, the methods should operate properly.
Constant Pressure			
Mechanical Leak Detector			

^Water detection is a requirement of ATG systems that was evaluated separately in this paper.
*See Appendices for testing methods and results (A, C, D, E, and F).

Technology is expected to be suitable for indicated use.
Technology has limitations with the indicated use.
Technology is expected to be not suitable for indicated use.

Why all the changes?

- Phase separation may not be detected by traditional ATG water floats.

- Phase separation can mask a leak.
- Extra precautions should be taken.
  - Questions should be raised.
  - Some tips / recommendations provided in this presentation.

Table 10. Suitability of Existing Leak Detection Technology for Ethanol-Blended Fuel (Continued)

LD Category and Technology	Is the Technology Capable of Detecting a Leak/Water Ingress at the Regulatory Level?		Comments
	Low-E (up to 15%)	High-E (51 to 83%)	
NON-VOLUMETRIC METHODS			
Vapor Out-of-tank Methods			
Tracers			Tracer must be proven compatible with the product, not foreseen as an issue given the available tracer compounds.
Liquid Out-of-tank Methods			
Hydrocarbon (HC) layer			Reduced petroleum content of high-E blends may produce difficulty in forming a free phase for detection.
Fuel Sensitive Polymers*			When the product is not dominated by hydrocarbons, the polymers may not react.
Acoustic Methods			
Sound Detection (Tanks)	Multiple liquid phases in a UST or piping and potential interfering sounds will make it difficult to identify air, water, or leaked fuel entering the tank while under vacuum.		No reliable database of sounds expected during leakage. Relies on human interpretation of noises during tank tightness testing.
Sound Detection (Piping)			
Interstitial Methods			
Liquid Filled			Should not be affected if liquid (product, water, or mixture of the two) is sufficiently dense or in sufficient quantity to trigger a reading.
Sensors – liquid ingress*			
Vacuum			
Pressure			
Water/Aqueous Phase Detection Methods^			
Water Float*			Potential effect on operation due to miscibility of water and ethanol-blended fuels.
Density Float*			Developed for use with E-blended fuel at the bottom of the tank.. Will not float until phase separation occurs.
Conductivity Water Probe			Current flow increases very slowly when there is water ingress into a tank with Low-E. This will not work with High-E because it is conductive.
Methods for Release Detection in Piping			
Pressure Decay*			Static method does not require exact fuel properties.

*See Appendices for testing methods and results (A, C, D, E, and F).
^Water detection is a requirement of ATG systems that was evaluated separately in this paper.

Technology is expected to be suitable for indicated use.
Technology has limitations with the indicated use.
Technology is expected to be not suitable for indicated use.

Are MS UST systems ripe for the ~~picking~~ "leaking"?

- Aged systems
- MS climate extremely humid
- Tanks breath

- Condensation + ethanol = acid
- Bugs + condensation + biofuels = acid

- We must be diligent with leak detection & preventing leaks & testing.

Annual Overfill Prevention Device Inspection

Why tilt / deflection now?

- More tanks leaking at tank top.
- Vapors. Sewer systems. Etc.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year					
Tank ID (product stored)					
Tank Volume (gallons)					
Tank Diameter (inches)					
Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Overfill Device Manufacturer					
Overfill Device Model					
Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Length of Ball Float Valve (inches)					
Ball Float Valve: Height of tank top manway (if applicable) (inches)					
Ball Float Valve: Distance below top of tank that ball float valve is set (inches)					
Ball Float Valve: Indicate tank capacity when flow restriction occurs (%)					
Drop Tube Device: Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Length of upper tube to the "Reference Point" (inches)					
Drop Tube Device: Length of Fill Riser pipe (Seating position to tank top) (Inches)					
Drop Tube Device: Height of tank top manway (if applicable) (inches)					
Drop Tube Device: Distance below tank top where "Reference Point" is located (Inches)					
Drop Tube Device: Distance between Reference Point and Complete Shut off Point					
Drop Tube Device: Distance below tank top where complete shut off occurs (inches)					
Drop Tube Device: Indicate tank capacity when complete (2nd Stage) shut off occurs (%)					
Electronic Alarm: Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Electronic Alarm: Distance below top of tank that electronic alarm is set (inches)					
Electronic Alarm: Indicate tank capacity when alarm occurs (%)					
Electronic Alarm: ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Inspection result (Pass/Fail)					

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Why Change?

- Numbers were all over the place.
- When they were right, matching what they should be for 90 or 95%, it wouldn't match what's installed in the tank.
- Issues with training and / or understanding. We needed clarification from manufacturer's….

Reasonable, but not 95%.

Note: MDEQ certification as a UST installer is required to install overfill prevention devices

Inspection Results for the Year 2015

Tank ID (product stored)	Reg1	Reg2	Prem	Diese
Tank diameter (inches)	96"	96"	96"	96"
Overfill device present (yes/no)	yes	yes	yes	yes
Device in good condition (yes/no)	yes	yes	yes	yes
All tank top fittings are tight (yes/no)	yes	yes	yes	yes
Standard drop tubes are installed in tank fills (yes/no)	yes	yes	yes	yes
Distance below top of tank that ball float valve is set (inches)	7"	7"	7"	7"
Indicate tank capacity when flow restriction occurs (%)	<95	<95	<95	<95
Tight fill adapter installed and is in good condition (yes/no)				
Assembly and all gaskets/seals in good condition (yes/no)				
Distance below top of tank that drop tube device is set (inches)				
Indicate tank capacity when complete shut off occurs (%)				
Alarm is audible to delivery driver (yes/no)				
Alarm is identifiable by delivery driver (yes/no)				
Distance below top of tank that electronic alarm is set (inches)				
Indicate tank capacity when alarm occurs (%)				
Inspection result (Pass/Fail)	Pass	Pass	Pass	Pass

So which is it? None are at 90 or 95%.

Note: MDEQ certification as a UST installer is required to install overfill prevention devices.

Inspection Results for the Year 2017

	Tank ID (product stored)	T1 Diesel	T2 Diesel	T3 Regular	T4 Premium
	Tank diameter (inches)	124"	124"	120"	96"
	Overfill device present (yes/no)	Yes	Yes	Yes	Yes
	Device in good condition (yes/no)	Yes	Yes	Yes	Yes
Ball Float Valve	All tank top fittings are tight (yes/no)	Yes	Yes	Yes	Yes
	Standard drop tubes are installed in tank fills (yes/no)	Yes	Yes	Yes	Yes
	Distance below top of tank that ball float valve is set (inches)	3"	3"	3"	3"
	Indicate tank capacity when flow restriction occurs (%)	90	90	90	90
Drop Tube Device	Tight fill adapter installed and is in good condition (yes/no)	Yes	Yes	Yes	Yes
	Assembly and all gaskets/seals in good condition (yes/no)	Yes	Yes	Yes	Yes
	Distance below top of tank that drop tube device is set (inches)	6"	6"	6"	6"
	Indicate tank capacity when complete shut off occurs (%)	95	95	95	95
Electronic Alarm	Alarm is audible to delivery driver (yes/no)	Yes	Yes	Yes	Yes
	Alarm is identifiable by delivery driver (yes/no)	Yes	Yes	Yes	Yes
	Distance below top of tank that electronic alarm is set (inches)	6"	6"	6"	6"
	Indicate tank capacity when alarm occurs (%)	95	95	95	95
	Inspection result (Pass/Fail)	Pass	Pass	Pass	Pass

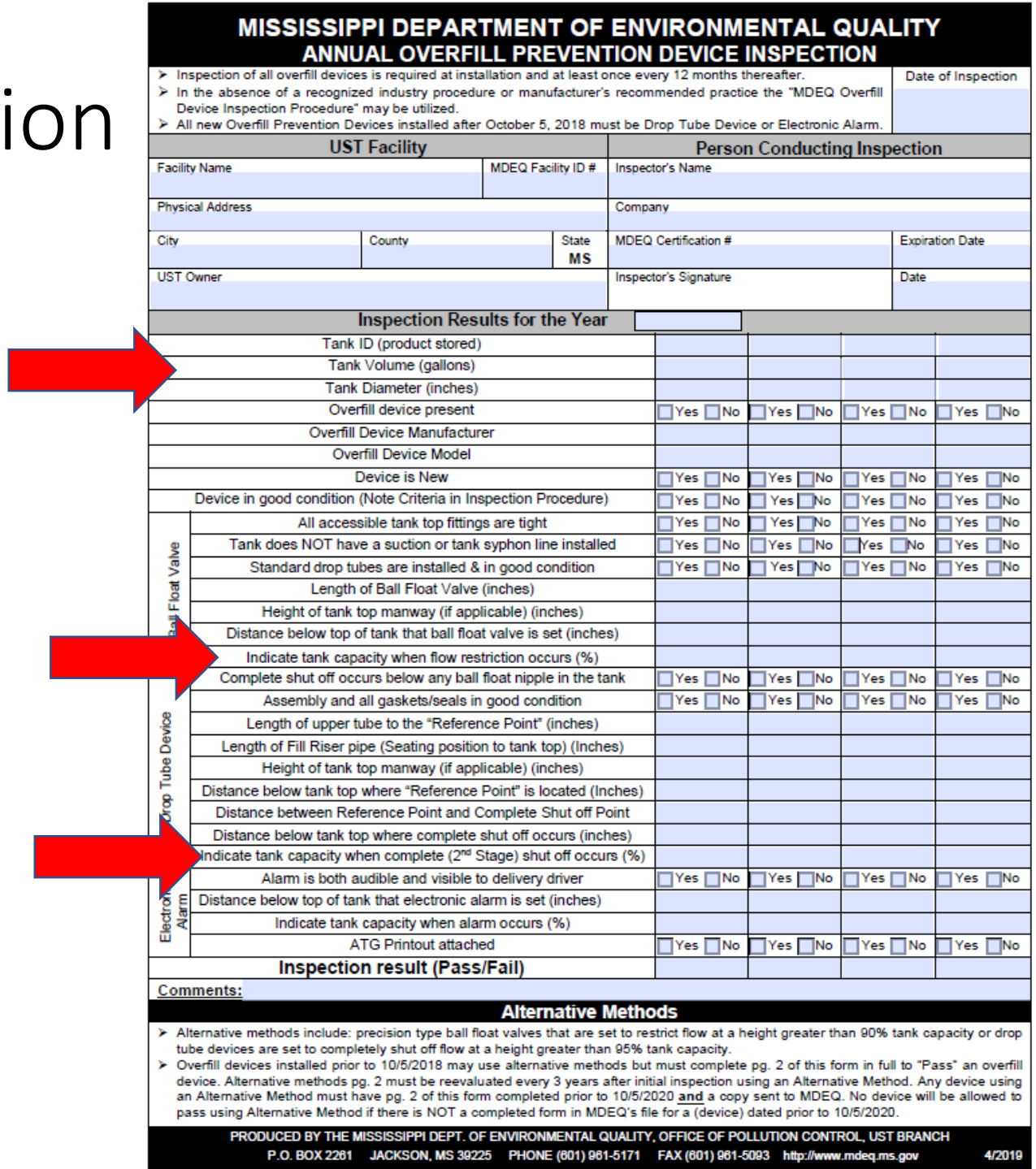
Comments:

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http:// www.deq.state.ms.us 1/12

Annual Overfill Prevention Device Inspection

- Tank Volume
  - Nominal volume (10,000 gallons)
    - Ok for cylinder tanks. Not FRP.
  - Actual volume (10,152 gallons)
    - Should be used for FRP tanks.
    - Tanks where you have to use tank chart to determine 90 or 95%.

- What is 90 & 95% based off of?
  - Tank Charts, primarily.
  - But there is easier way. (Cylinder tanks)



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year					
	Tank ID (product stored)				
	Tank Volume (gallons)				
	Tank Diameter (inches)				
	Overfill device present	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Overfill Device Manufacturer				
	Overfill Device Model				
	Device is New	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Device in good condition (Note Criteria in Inspection Procedure)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball Float Valve	All accessible tank top fittings are tight	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Tank does NOT have a suction or tank syphon line installed	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Standard drop tubes are installed & in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Length of Ball Float Valve (inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
	Complete shut off occurs below any ball float nipple in the tank	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Assembly and all gaskets/seals in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)				
	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below tank top where "Reference Point" is located (Inches)				
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Inspection result (Pass/Fail)				

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

What is 90 or 95%?

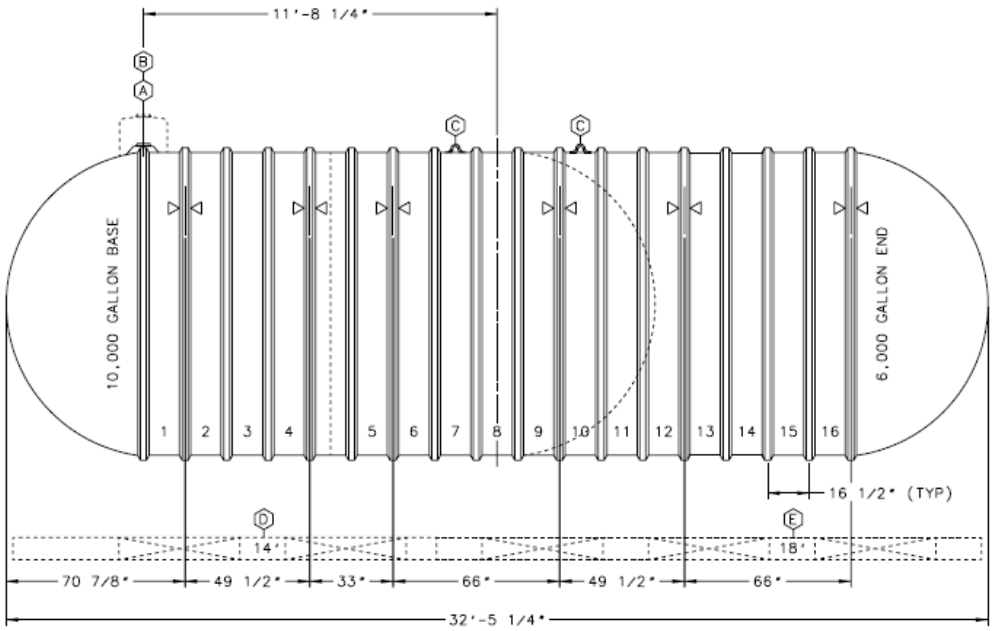
Diameter	Depth for 90%	Depth for 95%
48	7.5	5.0
60	9.5	6.0
72	11.5	7.0
84	13.5	8
96	15.0	9.5
108	17.0	10.5
120	19.0	12.0
126	19.5	12.5
132	20.5	13
144	22.5	14.0
Note: All measurements in inches. These depths only apply to cylindrical tanks. NOT to fiberglass tanks.		

- Cylinder tanks
  - Steel or Composite steel tanks
- Ex:
  - 10,000 gallon 96” diameter (STIp3)
  - 30,000 gallon 96” diameter (Act 100)
    - 95% for both is 9.5” below tank top
- Just because you put 9.5” on the form doesn’t make the device set at 9.5”.
- The majority of devices out there are NOT set properly. (No worries. Pg. 2)

Annual Overfill Prevention Device Inspection

What is 90 or 95%?

Fiberglass Tanks



- Base tank is typically the larger volume compartment.

Why you must use the tank chart:

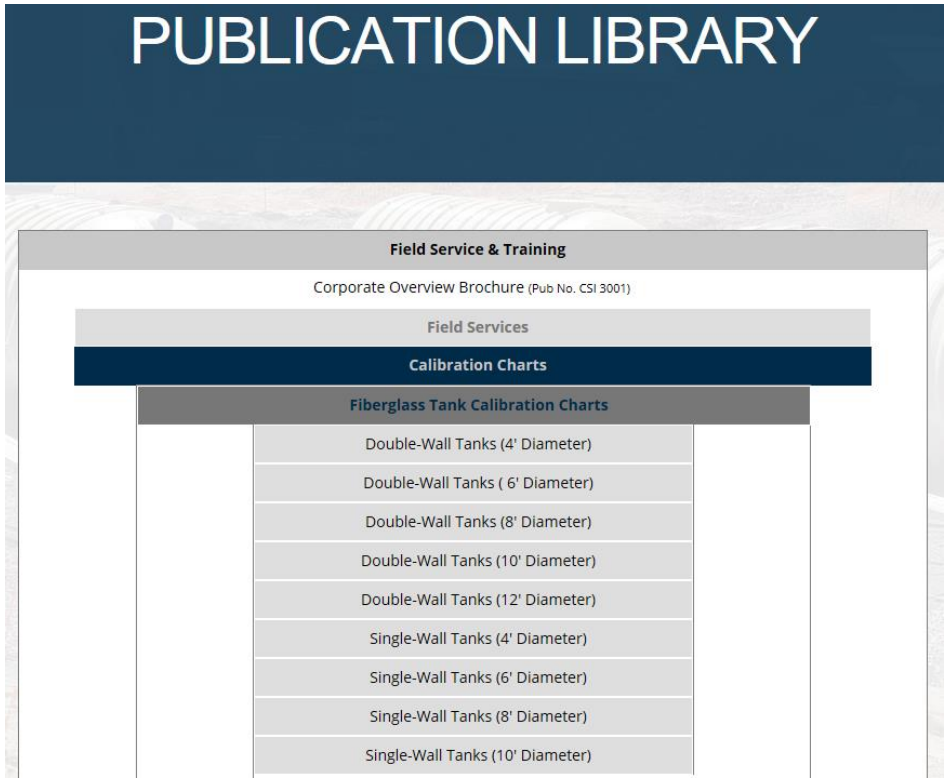
- FRP tanks are NOT cylindrical
- 90 or 95% may vary by up to ~2” from cylinder tanks
- Varying capacities & diameters per manufacturer.
- Manufacturer can be identified by:
  - Color of tank top in STP sumps.
  - Tank diameter.
    - Ex. (96” nominal diameter)
      - Xerxes actual diameter 90.5”
      - Containment Solutions actual diameter is 91.625”
- Model can be identified by:
  - Date of Tank installation.
  - Whether the tank is double or single walled.
- Both can be identified by:
  - Tank chart provided by fuel supplier or tank owner

Annual Overfill Prevention Device Inspection

Fiberglass tanks calibration charts.

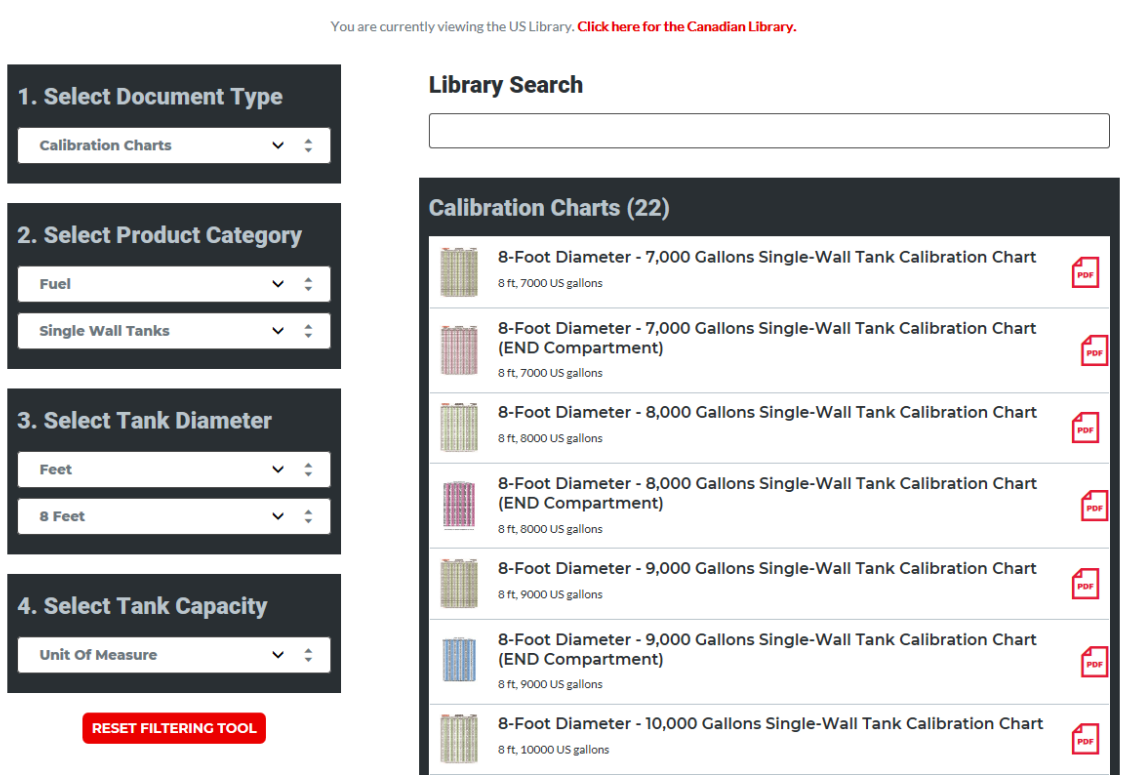
Containment Solutions

http://containmentsolutions.com/fsproduct-library.html



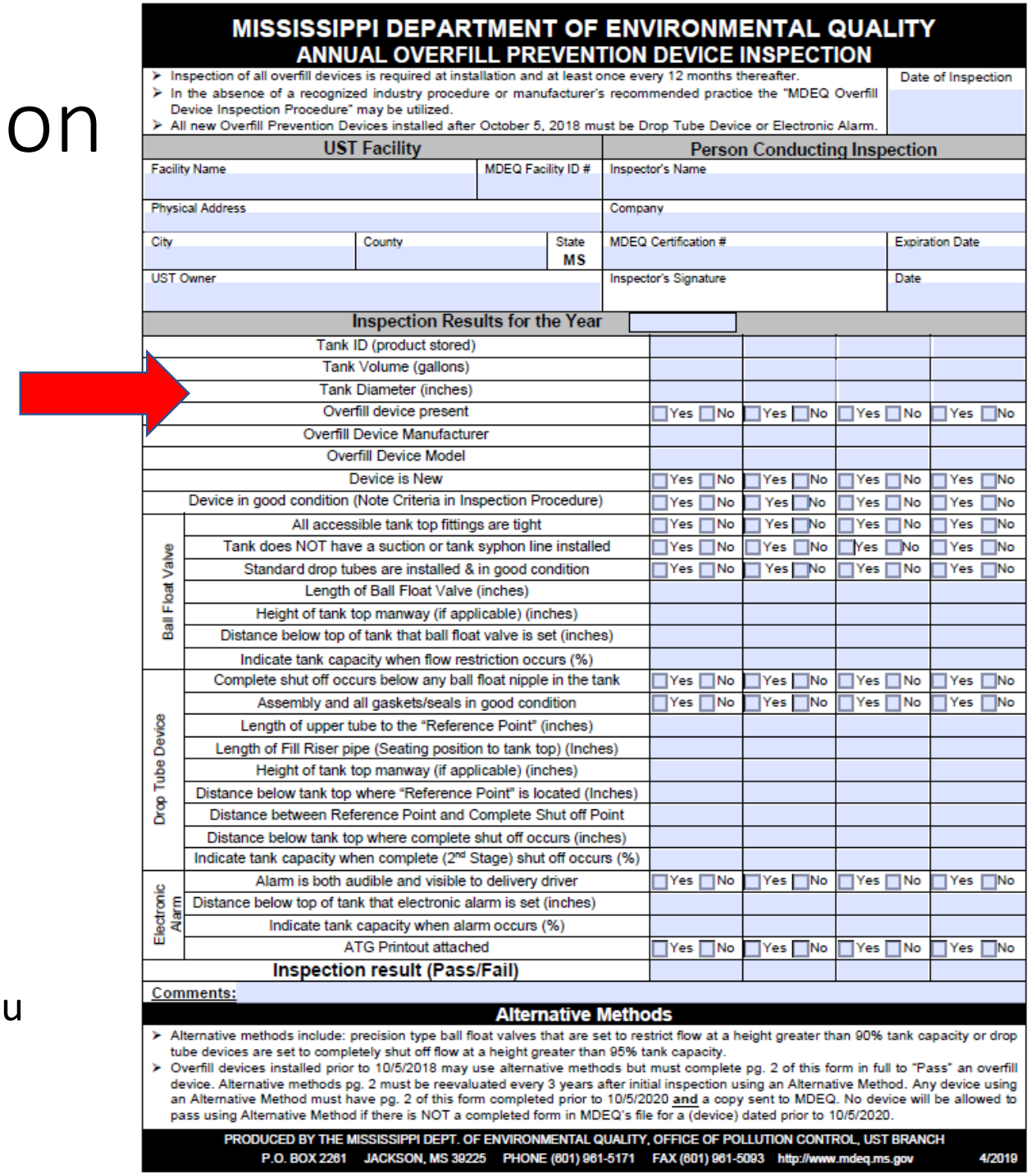
ZCL – Xerxes

https://www.zcl.com/en/document-library/



Annual Overfill Prevention Device Inspection

- Tank Diameter
  - Nominal Diameter (96”)
    - Ok. For Cylindrical tanks. Not OK for FRP tanks.
    - Ex. (96” nominal diameter FRP tank)
      - Xerxes diameter 90.5”
      - Containment Solutions diameter is 91.625”
      - Highly dependent on Manufacturer.
      - You should get FRP tank diameters from manufacturers tank chart
  - Actual Diameter – what you measure.
    - Not necessary for pg. 1
    - Deflection on pg. 2 will use actual diameter if you use pg. 2 on a device.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year ____

	Tank ID (product stored)				
	Tank Volume (gallons)				
	Tank Diameter (inches)				
	Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Overfill Device Manufacturer				
	Overfill Device Model				
	Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)				
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
Drop Tube Device	Height of tank top manway (if applicable) (inches)				
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)				
Drop Tube Device	Distance between Reference Point and Complete Shut off Point				
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)				
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)				

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

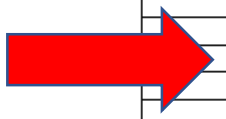
PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

- You should still measure the tanks diameter.
  - Confirm that the tank chart your using for FRP tank is accurate.
  - confirm that it is a steel tank <u>and</u> it's nominal diameter.
  - Ex. If you measure 90.5" indicates it may not be Steel.

    (Xerxes FRP 96" diameter tank is 90.5")
  - Check MDEQ registration for the tank to verify what it is.
  - Spot check Cathodic Protection on tank if you have equipment.
    - FRP tank you should not get a CP reading at tank bottom.
    - FRP tank all tank riser pipes should be isolated from one another.

    Connect volt meter leads to 2 riser pipes. If 6 mV or less both riser pipes are isolated and tank is either FRP or steel tank with isolation unions.
    - You should see both of these with a Fiberglass tank.
  - Check with delivery company, tank owner, and / or installer to verify.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility		Person Conducting Inspection	
Facility Name	MDEQ Facility ID #	Inspector's Name	
Physical Address		Company	
City / County / State (MS)		MDEQ Certification #	Expiration Date
UST Owner		Inspector's Signature	Date

Inspection Results for the Year ____

	Tank ID (product stored)				
	Tank Volume (gallons)				
	Tank Diameter (inches)				
	Overfill device present	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Overfill Device Manufacturer				
	Overfill Device Model				
	Device is New	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Device in good condition (Note Criteria in Inspection Procedure)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball Float Valve	All accessible tank top fittings are tight	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball Float Valve	Standard drop tubes are installed & in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop Tube Device	Assembly and all gaskets/seals in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)				
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
Drop Tube Device	Height of tank top manway (if applicable) (inches)				
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)				
Drop Tube Device	Distance between Reference Point and Complete Shut off Point				
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)				
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Inspection result (Pass/Fail)				

Comments:

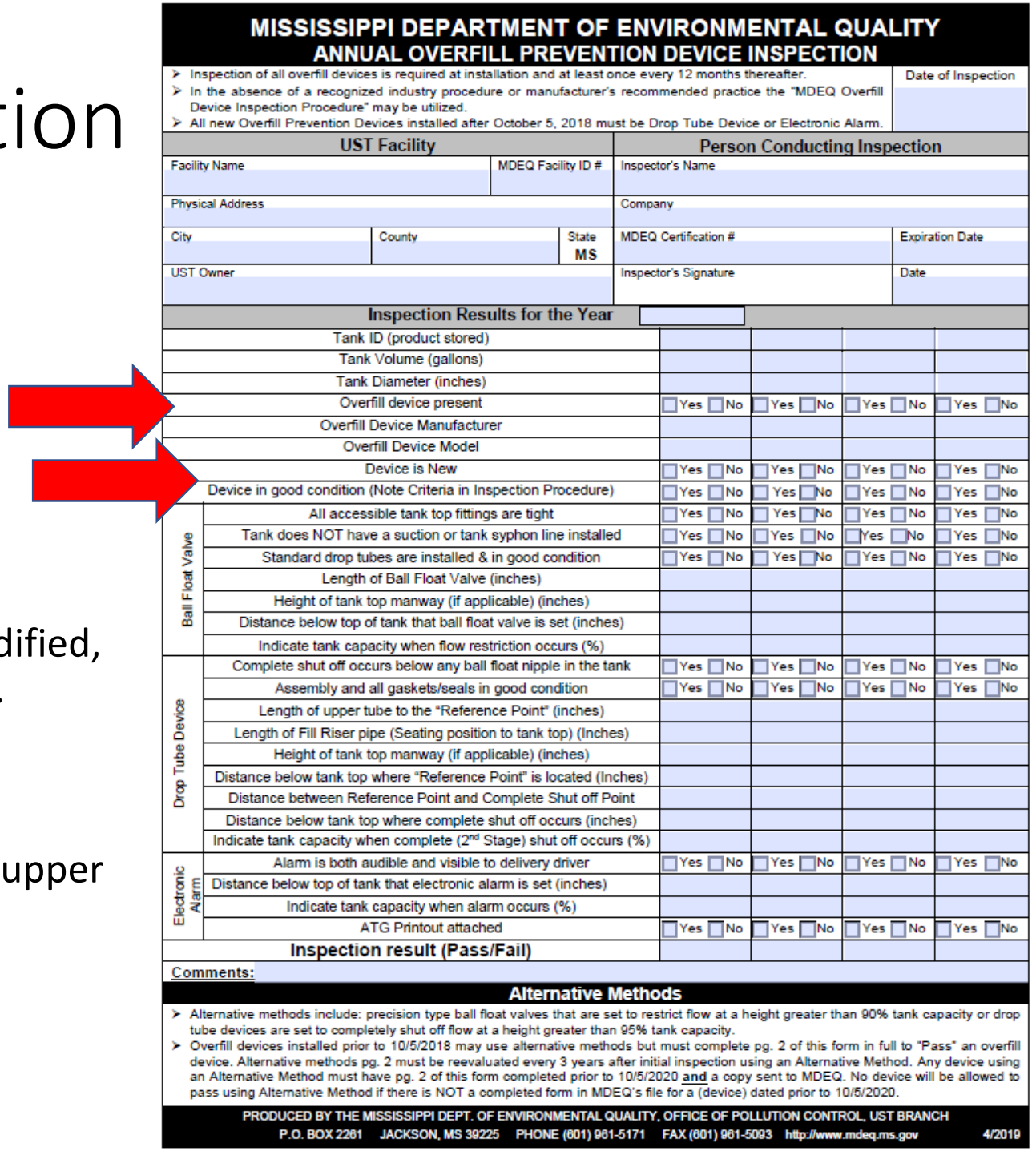
Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

- Automatic fails:
  - OF device is not present.
  - Device is New (ball float)?
    - If a ball float is new or has been recently modified, even if it is set correctly it automatically fails.
  - Device not in good condition.
    - Ball float – cage, nipple, ball.
    - Drop tube – difficult to raise, won't activate, upper tube not liquid tight, missing seals



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year					
Tank ID (product stored)					
Tank Volume (gallons)					
Tank Diameter (inches)					
Overfill device present	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Overfill Device Manufacturer					
Overfill Device Model					
Device is New	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Device in good condition (Note Criteria in Inspection Procedure)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Ball Float Valve: All accessible tank top fittings are tight	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Ball Float Valve: Tank does NOT have a suction or tank syphon line installed	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Ball Float Valve: Standard drop tubes are installed & in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Ball Float Valve: Length of Ball Float Valve (inches)					
Ball Float Valve: Height of tank top manway (if applicable) (inches)					
Ball Float Valve: Distance below top of tank that ball float valve is set (inches)					
Ball Float Valve: Indicate tank capacity when flow restriction occurs (%)					
Drop Tube Device: Complete shut off occurs below any ball float nipple in the tank	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Drop Tube Device: Assembly and all gaskets/seals in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Drop Tube Device: Length of upper tube to the "Reference Point" (inches)					
Drop Tube Device: Length of Fill Riser pipe (Seating position to tank top) (Inches)					
Drop Tube Device: Height of tank top manway (if applicable) (inches)					
Drop Tube Device: Distance below tank top where "Reference Point" is located (Inches)					
Drop Tube Device: Distance between Reference Point and Complete Shut off Point					
Drop Tube Device: Distance below tank top where complete shut off occurs (inches)					
Drop Tube Device: Indicate tank capacity when complete (2nd Stage) shut off occurs (%)					
Electronic Alarm: Alarm is both audible and visible to delivery driver	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Electronic Alarm: Distance below top of tank that electronic alarm is set (inches)					
Electronic Alarm: Indicate tank capacity when alarm occurs (%)					
Electronic Alarm: ATG Printout attached	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Inspection result (Pass/Fail)					

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

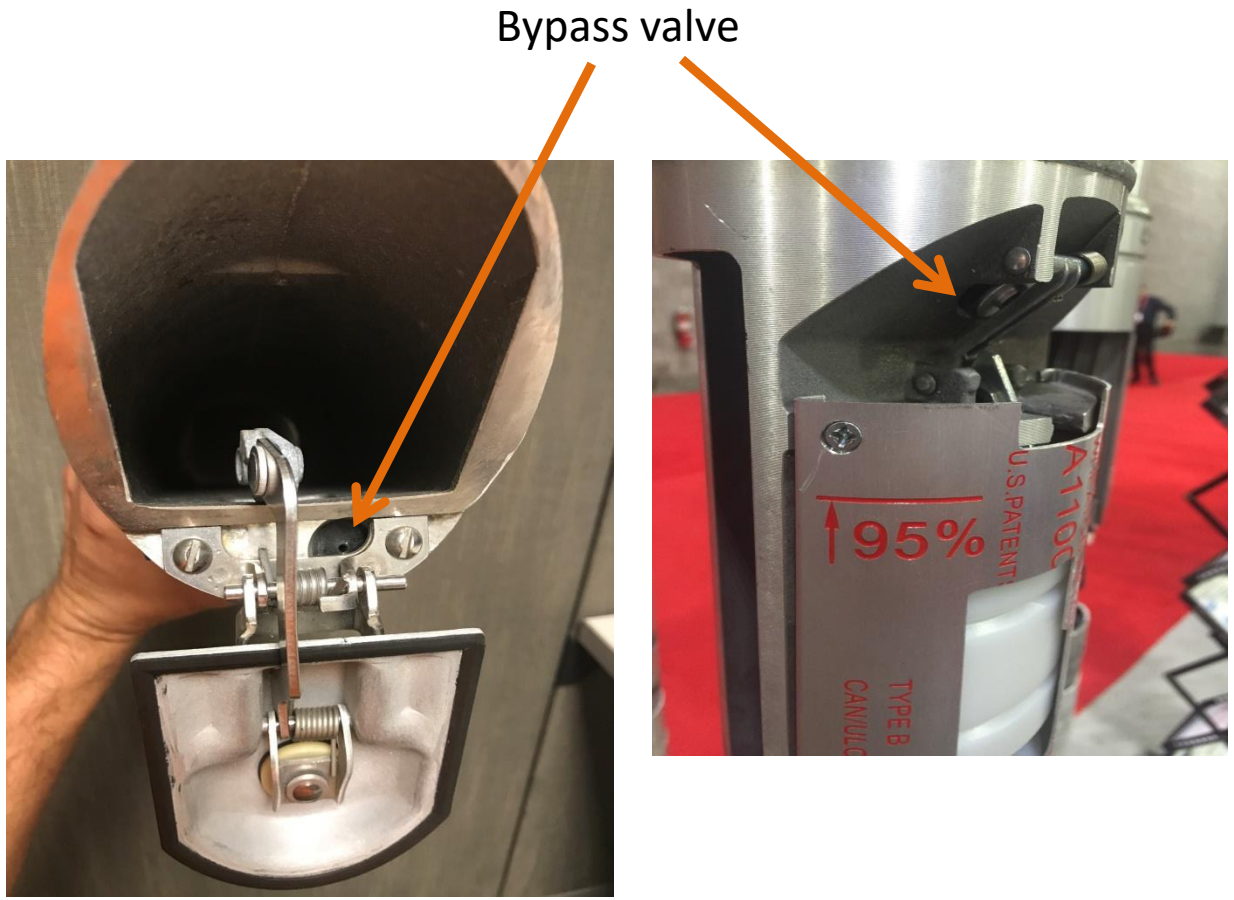
What is good condition for DT device?

- DT upper tube cannot have holes or seams.
- Gaskets present & in good shape?

Annual Overfill Prevention Device Inspection

What is good condition for DT device?

- Is the 2nd Stage bypass valve blocked?
- Does the 2nd Stage bypass valve close completely?
- Can you tell?
- In general if what you see / feel is normal for OPV preform visual inspection as you normally would.



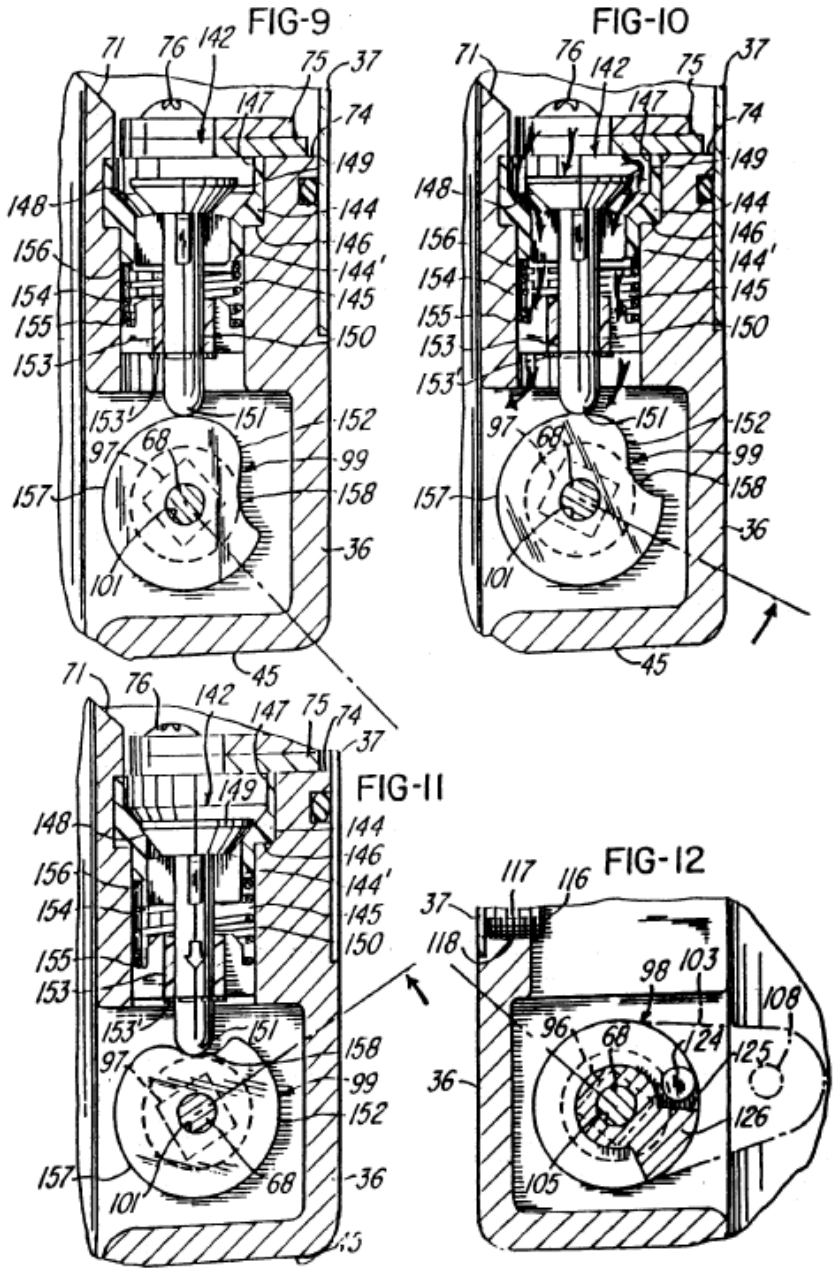
Annual Overfill Prevention Dev

What is good condition for DT device?

- OPW 61 & 71 SO bypass valve.
- Fig 9 & 10 bypass valve normally open.
  - Held open by gear.
- Fig 11 is point of restriction.
  - Spring closes bypass.
  - Can you feel it closing?

Question for 2 stage devices:

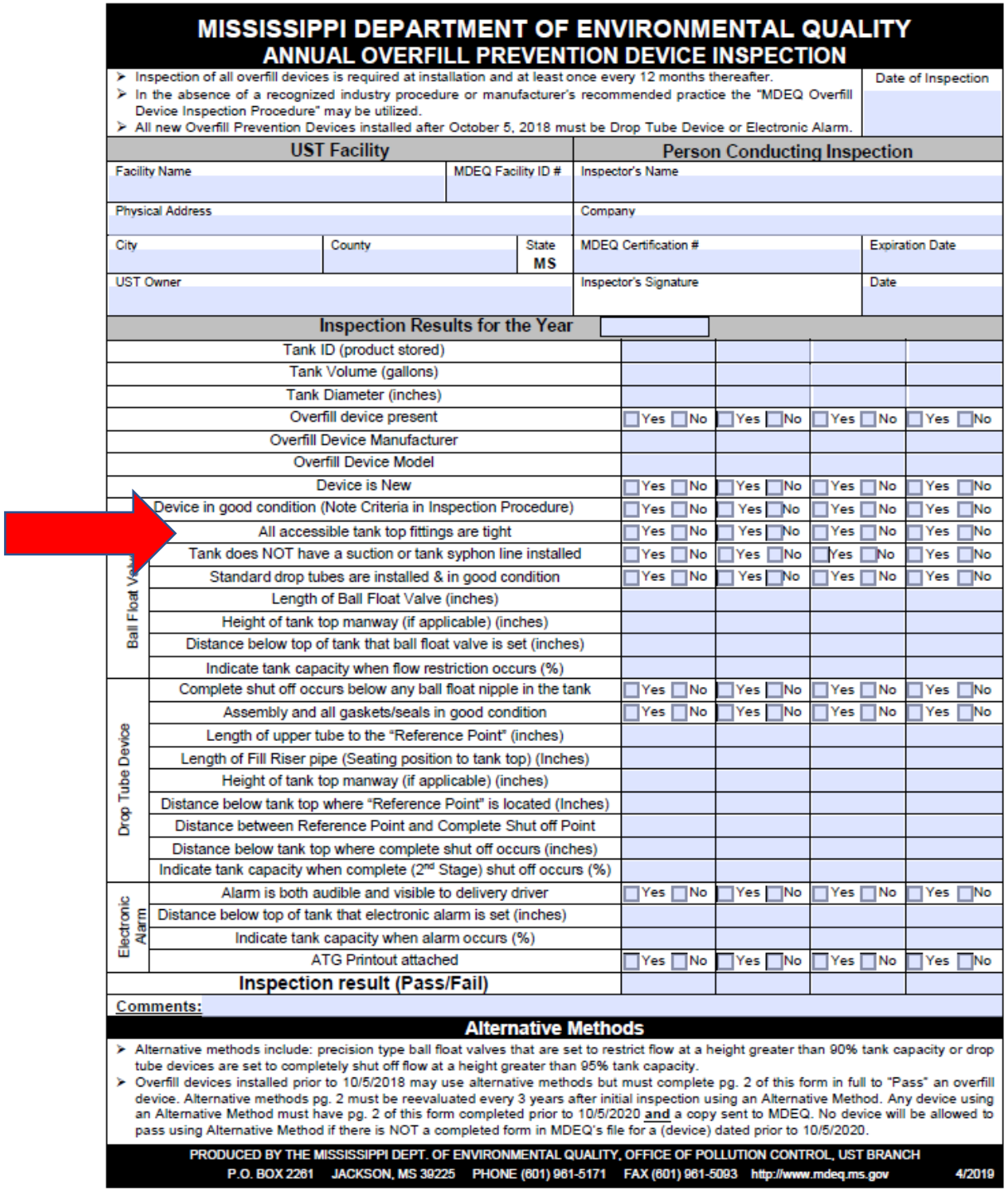
If it did close completely with fuel in upper tube what would reset it?



Annual Overfill Prevention Device Inspection

Ball Floats

- All Accessible tank top fittings are tight?
- If your answer is NO the BF automatically fails.
  - Unless you FIX the vapor leak before continuing.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year ____

	Tank ID (product stored)				
	Tank Volume (gallons)				
	Tank Diameter (inches)				
	Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Overfill Device Manufacturer				
	Overfill Device Model				
	Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)				
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
Drop Tube Device	Height of tank top manway (if applicable) (inches)				
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)				
Drop Tube Device	Distance between Reference Point and Complete Shut off Point				
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)				
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)				

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

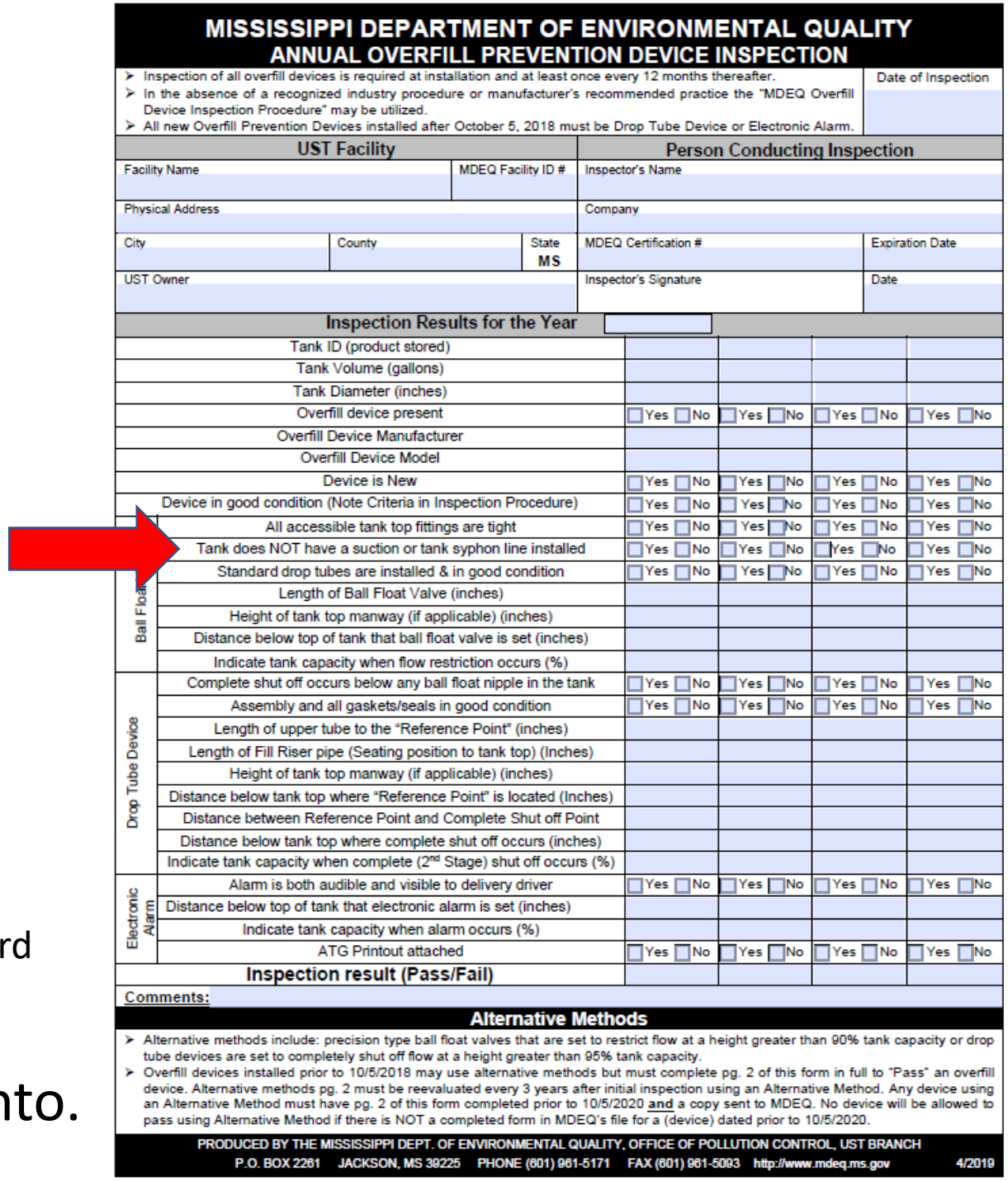
Ball Float – All Accessible tank top fittings

- In order for BF to function properly the tank must be vapor tight.
- Inspect:
  - Spill Bucket drain valves (hydro test)
  - LLD vent tubes
  - ATG wiring / plug on ATG caps.
  - All riser pipe caps.
  - All riser pipes in sumps. (STP)
    - Internal corrosion. Visually inspect outside of pipe for holes.

Annual Overfill Prevention Device Inspection

Ball Floats

- Ball float cannot be used with:
  - Tank Syphon (manifold) line
  - Suction Dispensers
- Why?
  - Ball float seats in tank being filled.
  - Will you see hose jump? No.
  - Forces fuel into other tank faster.
  - The tank being dropped into will continue to fill until device in 2nd or 3rd tank activate.
  - Can overfill the tank being dropped into.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year

Tank ID (product stored)					
Tank Volume (gallons)					
Tank Diameter (inches)					
Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Overfill Device Manufacturer					
Overfill Device Model					
Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float: All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float: Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float: Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float: Length of Ball Float Valve (inches)					
Ball Float: Height of tank top manway (if applicable) (inches)					
Ball Float: Distance below top of tank that ball float valve is set (inches)					
Ball Float: Indicate tank capacity when flow restriction occurs (%)					
Drop Tube Device: Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Length of upper tube to the "Reference Point" (inches)					
Drop Tube Device: Length of Fill Riser pipe (Seating position to tank top) (Inches)					
Drop Tube Device: Height of tank top manway (if applicable) (inches)					
Drop Tube Device: Distance below tank top where "Reference Point" is located (Inches)					
Drop Tube Device: Distance between Reference Point and Complete Shut off Point					
Drop Tube Device: Distance below tank top where complete shut off occurs (inches)					
Drop Tube Device: Indicate tank capacity when complete (2nd Stage) shut off occurs (%)					
Electronic Alarm: Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Electronic Alarm: Distance below top of tank that electronic alarm is set (inches)					
Electronic Alarm: Indicate tank capacity when alarm occurs (%)					
Electronic Alarm: ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Inspection result (Pass/Fail)					

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Ball Floats

- Standard drop tube should be present & vapor tight.
- A coaxial standard drop tube is the same thing.
  - It is not vapor tight and should be replaced if using BFS.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year					
	Tank ID (product stored)				
	Tank Volume (gallons)				
	Tank Diameter (inches)				
	Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Overfill Device Manufacturer				
	Overfill Device Model				
	Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Fl…	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Length of Ball Float Valve (inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Length of upper tube to the "Reference Point" (inches)				
	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below tank top where "Reference Point" is located (Inches)				
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)				

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Ball Float Measurements

- There is a great deal of confusion about how to measure length a ball float.

Inspection Results for the Year					
	Tank ID (product stored)	Regular	Plus	Premium	Diesel
	Tank Volume (gallons)	10,000	10,000	10,000	10,000
	Tank Diameter (inches)	96	96	96	96
	Overfill device present	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Overfill Device Manufacturer	OPW	OPW	OPW	Franklin Fueling
	Overfill Device Model	53 VML	53 VML	30 MV	EBW 308
	Device is New	☐Yes ■No	☐Yes ■No	☐Yes ■No	☐Yes ■No
	Device in good condition (Note Criteria in Inspection Procedure)	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Tank does NOT have a suction or tank syphon line installed	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Standard drop tubes are installed & in good condition	■Yes ☐No	■Yes ☐No	■Yes ☐No	☐Yes ☐No
	Length of Ball Float Valve (inches)	20	6	6	6
	Height of tank top manway (if applicable) (inches)				
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Length of upper tube to the "Reference Point" (inches)				
	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below tank top where "Reference Point" is located (Inches)				
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)				

Annual Overfill Prevention Device Inspection

Ball Float Measurements

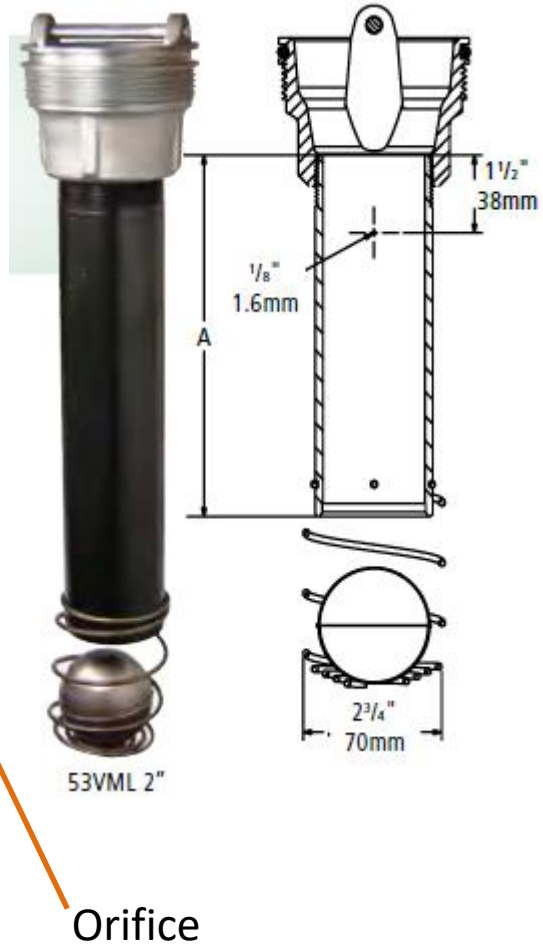
<u>Example:</u>

- This is NOT a 21” ball float.
  - Cage doesn’t count.
  - This is wrong.

Annual Overfill Prevention Device Inspection

Ball Float Measurements

- Measure from bottom of tube to top of nipple.
- Nipple may be slightly in adapter housing.
  - Ex. Shown 18” ball float.
- Is it precision or a normal BF?
  - Normal orifice – 1/8 “ diameter
  - Precision orifice – 1/16 “ diameter



Orifice

Annual Overfill Prevention Device Inspection

Tank Top Manway

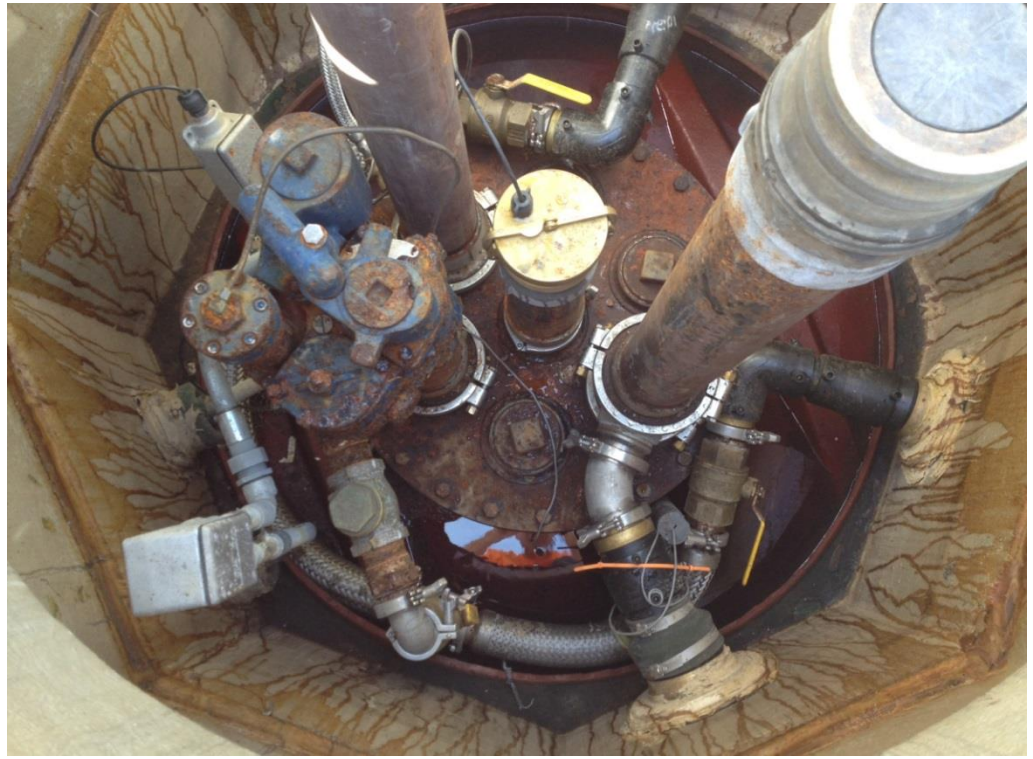
- Usually only on Fiberglass Tanks.
- If you do NOT have a tank manway, **or** the device is not installed in it then you should leave this
  - blank on the form
  - or enter 0".
  - It will not affect your measurements.

Inspection Results for the Year					
Tank ID (product stored)		Regular	Plus	Premium	Diesel
Tank Volume (gallons)		10,000	10,000	10,000	10,000
Tank Diameter (inches)		96	96	96	96
Overfill device present		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Overfill Device Manufacturer		OPW	OPW	OPW	Franklin Fueling
Overfill Device Model		53 VML	53 VML	30 MV	EBW 308
Device is New		□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Ball Float Valve	All accessible tank top fittings are tight	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Tank does NOT have a suction or tank syphon line installed	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Standard drop tubes are installed & in good condition	■Yes □No	■Yes □No	■Yes □No	□Yes □No
	Length of Ball Float Valve (inches)	20	6	6	6
	Height of tank top manway (if applicable) (inches)	5	0	0	0
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Assembly and all gaskets/seals in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Length of upper tube to the "Reference Point" (inches)				
	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below tank top where "Reference Point" is located (Inches)				
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Inspection result (Pass/Fail)					

Annual Overfill Prevention Device Inspection

Height of Tank Top Manway?

- If BF is installed in one of these risers you must measure height of tank top manway.



Inspection Results for the Year		Regular	Plus	Premium	Diesel
Tank ID (product stored)		Regular	Plus	Premium	Diesel
Tank Volume (gallons)		10,000	10,000	10,000	10,000
Tank Diameter (inches)		96	96	96	96
Overfill device present		■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Overfill Device Manufacturer		OPW	OPW	OPW	Franklin Fueling
Overfill Device Model		53 VML	53 VML	30 MV	EBW 308
Device is New		☐Yes ■No	☐Yes ■No	☐Yes ■No	☐Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
at Valve	All accessible tank top fittings are tight	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Tank does NOT have a suction or tank syphon line installed	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Standard drop tubes are installed & in good condition	■Yes ☐No	■Yes ☐No	■Yes ☐No	☐Yes ☐No
	Length of Ball Float Valve (inches)	20	6	6	6
	Height of tank top manway (if applicable) (inches)	5	0	0	0
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Length of upper tube to the "Reference Point" (inches)				
	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below tank top where "Reference Point" is located (Inches)				
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Inspection result (Pass/Fail)					

Annual Overfill Prevention Device Inspection

Distance below top of tank that ball float valve is set

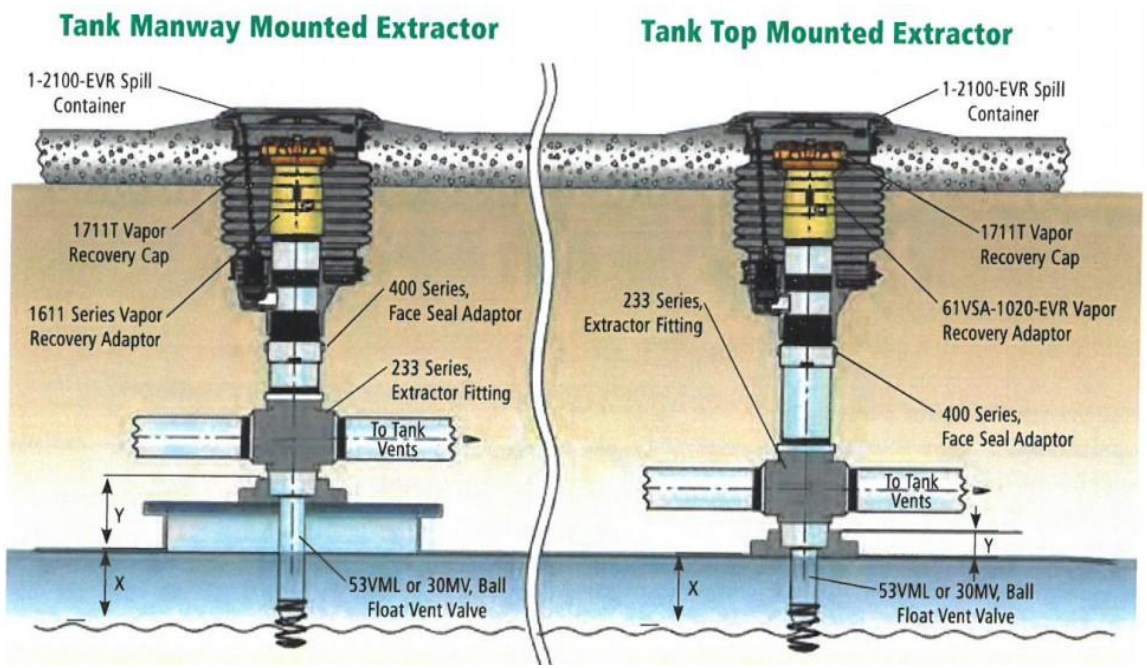
- If no Tank top manway it is the length of the BF.
- If tank top manway you have to subtract it out.

  (Next Slide example)

Inspection Results for the Year					
Tank ID (product stored)		Regular	Plus	Premium	Diesel
Tank Volume (gallons)		10,000	10,000	10,000	10,000
Tank Diameter (inches)		96	96	96	96
Overfill device present		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Overfill Device Manufacturer		OPW	OPW	OPW	Franklin Fueling
Overfill Device Model		53 VML	53 VML	30 MV	EBW 308
Device is New		□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Float Valve	All accessible tank top fittings are tight	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Tank does NOT have a suction or tank syphon line installed	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Standard drop tubes are installed & in good condition	■Yes □No	■Yes □No	■Yes □No	□Yes □No
	Length of Ball Float Valve (inches)	20	6	6	6
	Height of tank top manway (if applicable) (inches)	5	0	0	0
	Distance below top of tank that ball float valve is set (inches)	15	6	6	6
	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Assembly and all gaskets/seals in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Length of upper tube to the "Reference Point" (inches)				
	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below tank top where "Reference Point" is located (Inches)				
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Inspection result (Pass/Fail)					

Annual Overfill Prevention Device Inspection

Tank Top Manway calculation



- Note: Image is for Ball Float but it also applies to drop tube devices installed on tank top manways.

- Manway usually 4 – 7” above tank top
- Tank manway mounted extractor
  - Use your BF measurement to subtract out the height of the tank manway.
  - Example:

	20”	ball float tube (measured)
-	5”	height of tank top manway
	15”	below tank top

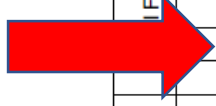
- If 90% is not 15” then BF device fails.

- Same calculation on pg. 1 for Drop tubes.

Annual Overfill Prevention Device Inspection

BF results pg. 1

- Determine % capacity when flow restriction occurs.
- If:
  - Set @ 90% or less it passes.
  - Not set at 90% it fails, unless:
    - It is a precision BF and
    - You use pg. 2 to document it.



Inspection Results for the Year					
	Tank ID (product stored)	Regular	Plus	Premium	Diesel
	Tank Volume (gallons)	10,000	10,000	10,000	10,000
	Tank Diameter (inches)	96	96	96	96
	Overfill device present	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Overfill Device Manufacturer	OPW	OPW	OPW	Franklin Fueling
	Overfill Device Model	53 VML	53 VML	30 MV	EBW 308
	Device is New	□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
	Device in good condition (Note Criteria in Inspection Procedure)	■Yes □No	■Yes □No	■Yes □No	■Yes □No
Float Valve	All accessible tank top fittings are tight	■Yes □No	■Yes □No	■Yes □No	■Yes □No
Float Valve	Tank does NOT have a suction or tank syphon line installed	■Yes □No	■Yes □No	■Yes □No	■Yes □No
Float Valve	Standard drop tubes are installed & in good condition	■Yes □No	■Yes □No	■Yes □No	□Yes □No
Float Valve	Length of Ball Float Valve (inches)	20	6	6	6
Float Valve	Height of tank top manway (if applicable) (inches)	5	0	0	0
Float Valve	Distance below top of tank that ball float valve is set (inches)	15	6	6	6
Float Valve	Indicate tank capacity when flow restriction occurs (%)	90%	97%	97%	97%
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Drop Tube Device	Assembly and all gaskets/seals in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)				
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
Drop Tube Device	Height of tank top manway (if applicable) (inches)				
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)				
Drop Tube Device	Distance between Reference Point and Complete Shut off Point				
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)				
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Inspection result (Pass/Fail)	Pass	Fail	Fail	Fail

Annual Overfill Prevention Device Inspection

BF results pg. 1

- Is it precision or a normal BF?
  - Normal orifice – 1/8 “ diameter
  - Precision orifice – 1/16 “ diameter
- OPW 53 VML – is not precision.
- OPW 30 MV is retrofit orifice. – it is precision.
- EBW 308 – it is precision.

  (Some EBW 308 valves are NOT precision. Depends on Length.)
- As it sits:
  - Regular – Passes @ 90 %
  - Plus – Fails – is not precision.
  - Prem & Diesel may pass if you choose to use pg. 2

Inspection Results for the Year					
	Tank ID (product stored)	Regular	Plus	Premium	Diesel
	Tank Volume (gallons)	10,000	10,000	10,000	10,000
	Tank Diameter (inches)	96	96	96	96
	Overfill device present	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Overfill Device Manufacturer	OPW	OPW	OPW	Franklin Fueling
	Overfill Device Model	53 VML	53 VML	30 MV	EBW 308
	Device is New	☐Yes ■No	☐Yes ■No	☐Yes ■No	☐Yes ■No
	Device in good condition (Note Criteria in Inspection Procedure)	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Ball Float Valve	Standard drop tubes are installed & in good condition	■Yes ☐No	■Yes ☐No	■Yes ☐No	☐Yes ☐No
Ball Float Valve	Length of Ball Float Valve (inches)	20	6	6	6
Ball Float Valve	Height of tank top manway (if applicable) (inches)	5	0	0	0
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)	15	6	6	6
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)	90%	97%	97%	97%
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Length of upper tube to the “Reference Point” (inches)				
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
Drop Tube Device	Height of tank top manway (if applicable) (inches)				
Drop Tube Device	Distance below tank top where “Reference Point” is located (Inches)				
Drop Tube Device	Distance between Reference Point and Complete Shut off Point				
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)				
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)	Pass	Fail	Fail	Fail

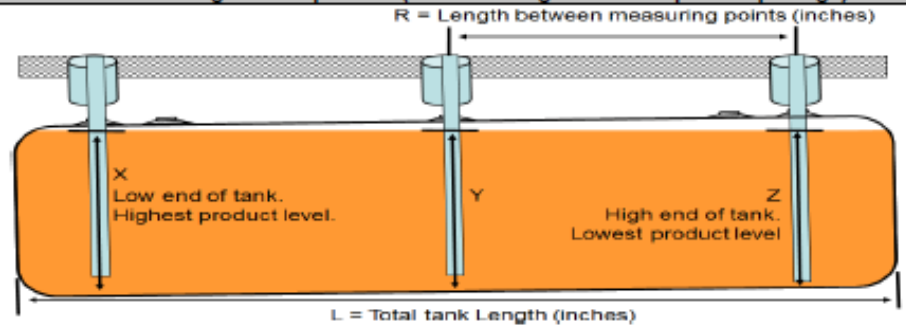
Annual Overfill Prevention Device Inspection

Alternative Method BF's pg. 2

- Will cover steps for tilt & deflection in DT section of presentation.
- For this example I provided #s
- The main question is:

  "Does initial restriction occur 30 min before tank top fittings are wetted"?

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer	☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):

Tank ID (product stored)	Prem	Diesel		
Tank capacity greater than 4,000 gallons?	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (Inches)				
Product level measured at "X" (inches)				
Product level measured at "Y" (inches)				
Product level measured at "Z" (inches)				
Difference between product levels (inches)				
Overall Tank Tilt (inches)	1	2		

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)	1	1		

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		■ B.F. ☐ D.T	■ B.F. ☐ D.T	■ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End ("X" position)	■	☐	☐	☐
	Center ("Y" position)	☐	☐	☐	☐
	High End ("Z" position)	☐	■	■	☐
Distance of Device below tank top at low end of tank (inches)		6	3		
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)		260	93		

Alternative Method Results (mark all that apply)

Manifolded tank tops OR the overfill devices installed in them appear to be level with each other	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is "precision" type and initial restriction occurs 30 min before tank top fittings wetted.	☐ Yes ■ No	☐ Yes ■ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is "2 Stage" device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)				

Annual Overfill Prevention Device Inspection

"Does initial restriction occur 30 min before tank top fittings are wetted"?

- OPW 30MV requires 308 gallons
- EBW 308 valve requires ?? Gallons
  - But these assume what?
    - No tilt?
    - No deflection?
- In our example:
  - Prem tank OPW 30 MV valve not 308 gallons at the low end. It Fails.
  - Diesel EBW 308 valve I couldn't find gallons for it. It Fails.

OPW **Tank Ullage Calculator**

- 30 minutes x 5GPM = 150 gallons
- Ullage compression rate* is 27% after the ball seats
- 150 gallons ÷ .73 (1– ullage compression rate) = 205.48 gallons
- 205.48 x 1.5 (OPW recommended safety factor) = 308.22 gallons
- Approximately 308 gallons required ullage

*Ullage compression rate will vary with head pressure.

Device Position and Ullage Calculation					
Type of Device: (Ball Float or Drop Tube)		■ B.F. □ D.T	■ B.F. □ D.T	■ B.F. □ D.T	□ B.F. □ D.T
Overfill Device is Installed at	Low End ("X" position)	■	□	□	□
	Center ("Y" position)	□	□	□	□
	High End ("Z" position)	□	■	■	□
Distance of Device below tank top at low end of tank (inches)		6	3		
Ullage (gallons): (Based on depth of device below tank top at the low end of the tank)		260	93		
Alternative Method Results (mark all that apply)					
Manifolded tank tops OR the overfill devices installed in them appear to be level with each other		□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Ball float is "precision" type and initial restriction occurs 30 min before tank top fittings wetted.		□ Yes ■ No	□ Yes ■ No	□ Yes □ No	□ Yes □ No
Drop tube device is "2 Stage" device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)		□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Inspection for Alternative Method (Pass / Fail)		FAIL	FAIL		

Annual Overfill Prevention Device Inspection

BF results pg. 1

- As it sits:
  - Regular – Passes @ 90 %
  - Plus – Fails – is not precision.
  - Prem – Fails – not 308 gallons ullage @ low end of tank on pg. 2
  - Diesel – Fails – undetermined gallons required on pg. 2.

- The BF "Alternative Method" main question:

  "Does initial restriction occur 30 min before tank top fittings are wetted"?

Requires ALL tank fittings to be vapor tight. How often is that true?

Inspection Results for the Year					
Tank ID (product stored)		Regular	Plus	Premium	Diesel
Tank Volume (gallons)		10,000	10,000	10,000	10,000
Tank Diameter (inches)		96	96	96	96
Overfill device present		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Overfill Device Manufacturer		OPW	OPW	OPW	Franklin Fueling
Overfill Device Model		53 VML	53 VML	30 MV	EBW 308
Device is New		□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Ball Float Valve	All accessible tank top fittings are tight	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Tank does NOT have a suction or tank syphon line installed	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Standard drop tubes are installed & in good condition	■Yes □No	■Yes □No	■Yes □No	□Yes □No
	Length of Ball Float Valve (inches)	20	6	6	6
	Height of tank top manway (if applicable) (inches)	5	0	0	0
	Distance below top of tank that ball float valve is set (inches)	15	6	6	6
	Indicate tank capacity when flow restriction occurs (%)	90%	97%	97%	97%
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Assembly and all gaskets/seals in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Length of upper tube to the "Reference Point" (inches)				
	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below tank top where "Reference Point" is located (Inches)				
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Inspection result (Pass/Fail)		Pass	Fail	Fail	Fail

Annual Overfill Prevention Device Inspection

Ball Float Repairs

- After 10/5/18 ball floats can NOT be replaced / modified / or repaired.
- All previous repairs should have used “manufacturer’s” parts.
- Would this elongation work?
  - Yes, it likely would but how well?
    - Where is the orifice at?
    - It’s not near the top where the original manufacturer requires it to be.
- This BF is now your product. You are it’s manufacturer.
  - No UL listing for it.
  - Do you really want this liability?
- BF requires riser pipes to be vapor tight. Most are not.
- Why do you think the EPA banned Ball Floats immediately with 2018 regs?
- Leak (vapors or fuel) / tanks over filled = “LAWSUIT”
  - WHO WILL THEY SUE?
    - The Manufacturer? (You if you modified this.)
    - Company who passed it? (You if you don’t fail this.)

Annual Overfill Prevention Device Inspection

Ball Float Repairs / modifications

- So when you see this:

  Who is the manufacturer?

- It's Billy bobs device….

- Should a lawyer ask you or Billy Bob for the UL listing for this device can you provide it?

  NO…

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year ____

	Tank ID (product stored)				
	Tank Volume (gallons)				
	Tank Diameter (inches)				
	Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Overfill Device Manufacturer				
	Overfill Device Model				
	Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)				
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
Drop Tube Device	Height of tank top manway (if applicable) (inches)				
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)				
Drop Tube Device	Distance between Reference Point and Complete Shut off Point				
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)				
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)				

Comments:

Alternative Methods

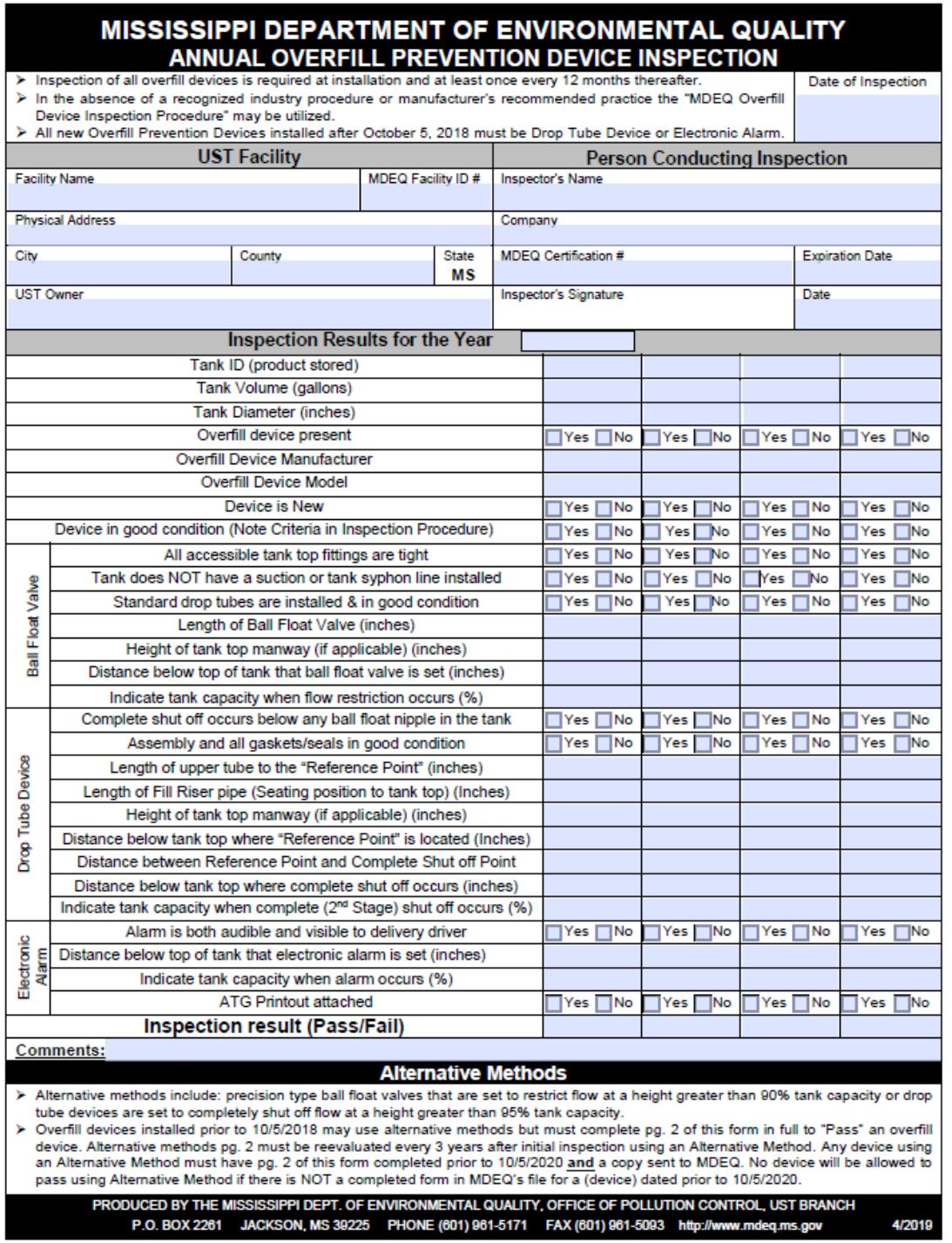
- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Ball Floats & Drop Tube Shut-off Devices

- If tank has a Ball Float & drop tube
- Drop Tube device is the “Primary” device
- You must:
  - Completely remove ball float including nipple.
  - Or Drop tube MUST be set to shut off below the ball float
    - Record measurement for BF and DT on pg. 1
    - You MUST use Pg. 2 to prove DT set below BF.
- Why?
  - If BF activates first, DT will not slam shut because fuel flow is already restricted by BF.
  - You have 2 orifices for vapors to escape.
    - 1 in ball float & 1 in Drop tube device
    - Tank will fill at least 2 times as fast as it should
  - If no ball in ball float, fuel will fill vent pipe possibly burping fuel.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year ____

	Tank ID (product stored)							
	Tank Volume (gallons)							
	Tank Diameter (inches)							
	Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Overfill Device Manufacturer							
	Overfill Device Model							
	Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Length of Ball Float Valve (inches)							
	Height of tank top manway (if applicable) (inches)							
	Distance below top of tank that ball float valve is set (inches)							
	Indicate tank capacity when flow restriction occurs (%)							
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Length of upper tube to the "Reference Point" (inches)							
	Length of Fill Riser pipe (Seating position to tank top) (Inches)							
	Height of tank top manway (if applicable) (inches)							
	Distance below tank top where "Reference Point" is located (Inches)							
	Distance between Reference Point and Complete Shut off Point							
	Distance below tank top where complete shut off occurs (inches)							
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)							
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Distance below top of tank that electronic alarm is set (inches)							
	Indicate tank capacity when alarm occurs (%)							
	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No			
	Inspection result (Pass/Fail)							

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

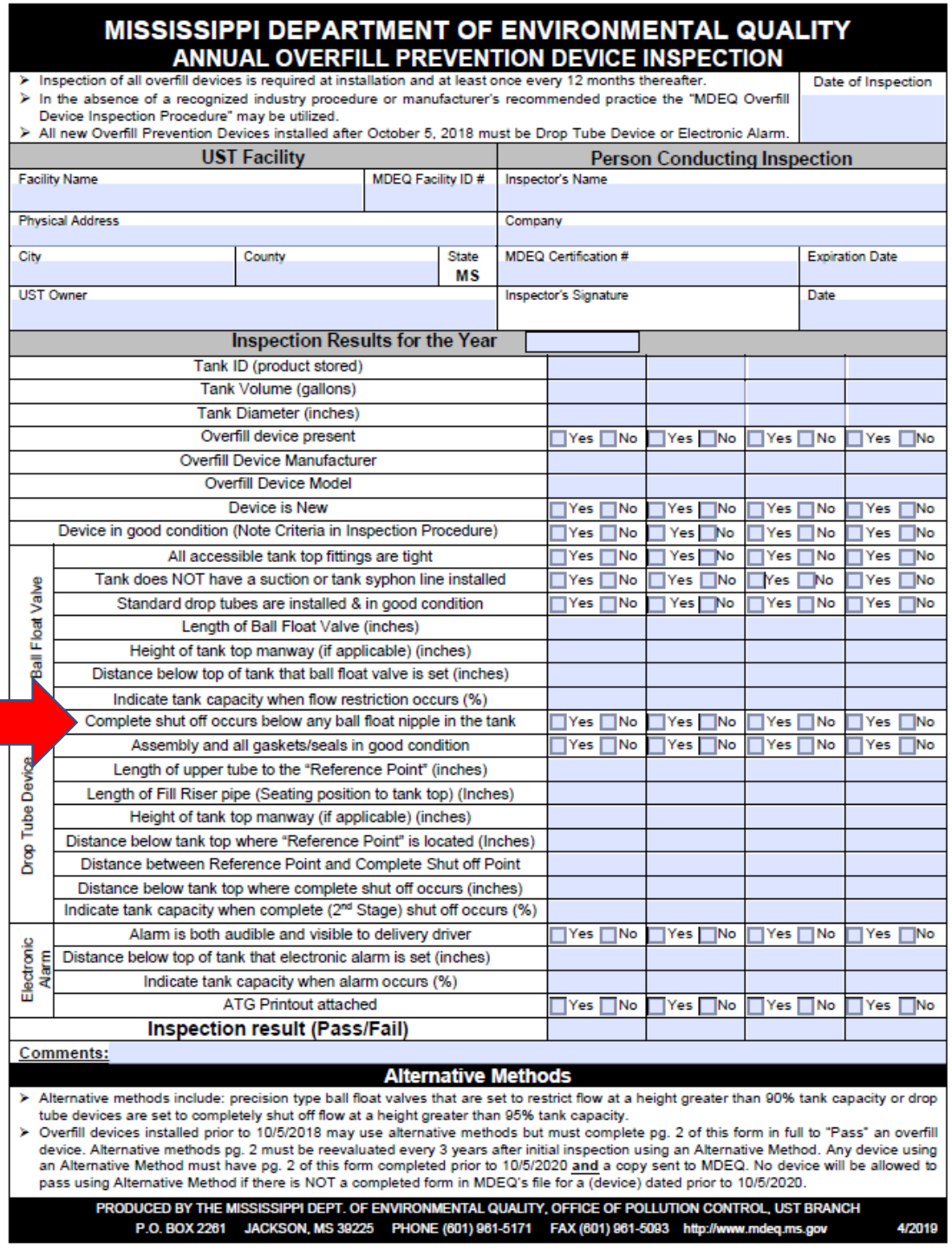
Annual Overfill Prevention Device Inspection

Complete shut off below any ball float nipple in tank

- Question applies to ball floats (with or without a ball)
- If you can't get a cap off to verify, you should FAIL the DT.
- Why?
  - You can't confirm this question.
  - MDEQ will pursue enforcement against you if a nipple & drop tube is present & you didn't document it.
- Should caps be removed every year to verify? Yes.
- If both BF nipple & DT are present, you can use pg. 2 pass the DT. (will cover shortly how)

**We don't expect anyone to excavate down to tank top to verify that the vent stub doesn't have a BF in it.

**If you don't see a ball float in riser pipes or don't have a riser pipe where one could be located at, mark this question "yes".



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year ____

Tank ID (product stored)					
Tank Volume (gallons)					
Tank Diameter (inches)					
Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Overfill Device Manufacturer					
Overfill Device Model					
Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Length of Ball Float Valve (inches)					
Ball Float Valve: Height of tank top manway (if applicable) (inches)					
Ball Float Valve: Distance below top of tank that ball float valve is set (inches)					
Ball Float Valve: Indicate tank capacity when flow restriction occurs (%)					
Ball Float Valve: Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Length of upper tube to the "Reference Point" (inches)					
Drop Tube Device: Length of Fill Riser pipe (Seating position to tank top) (Inches)					
Drop Tube Device: Height of tank top manway (if applicable) (inches)					
Drop Tube Device: Distance below tank top where "Reference Point" is located (Inches)					
Drop Tube Device: Distance between Reference Point and Complete Shut off Point					
Drop Tube Device: Distance below tank top where complete shut off occurs (inches)					
Drop Tube Device: Indicate tank capacity when complete (2nd Stage) shut off occurs (%)					
Electronic Alarm: Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Electronic Alarm: Distance below top of tank that electronic alarm is set (inches)					
Electronic Alarm: Indicate tank capacity when alarm occurs (%)					
Electronic Alarm: ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Inspection result (Pass/Fail)					

Comments:

Alternative Methods

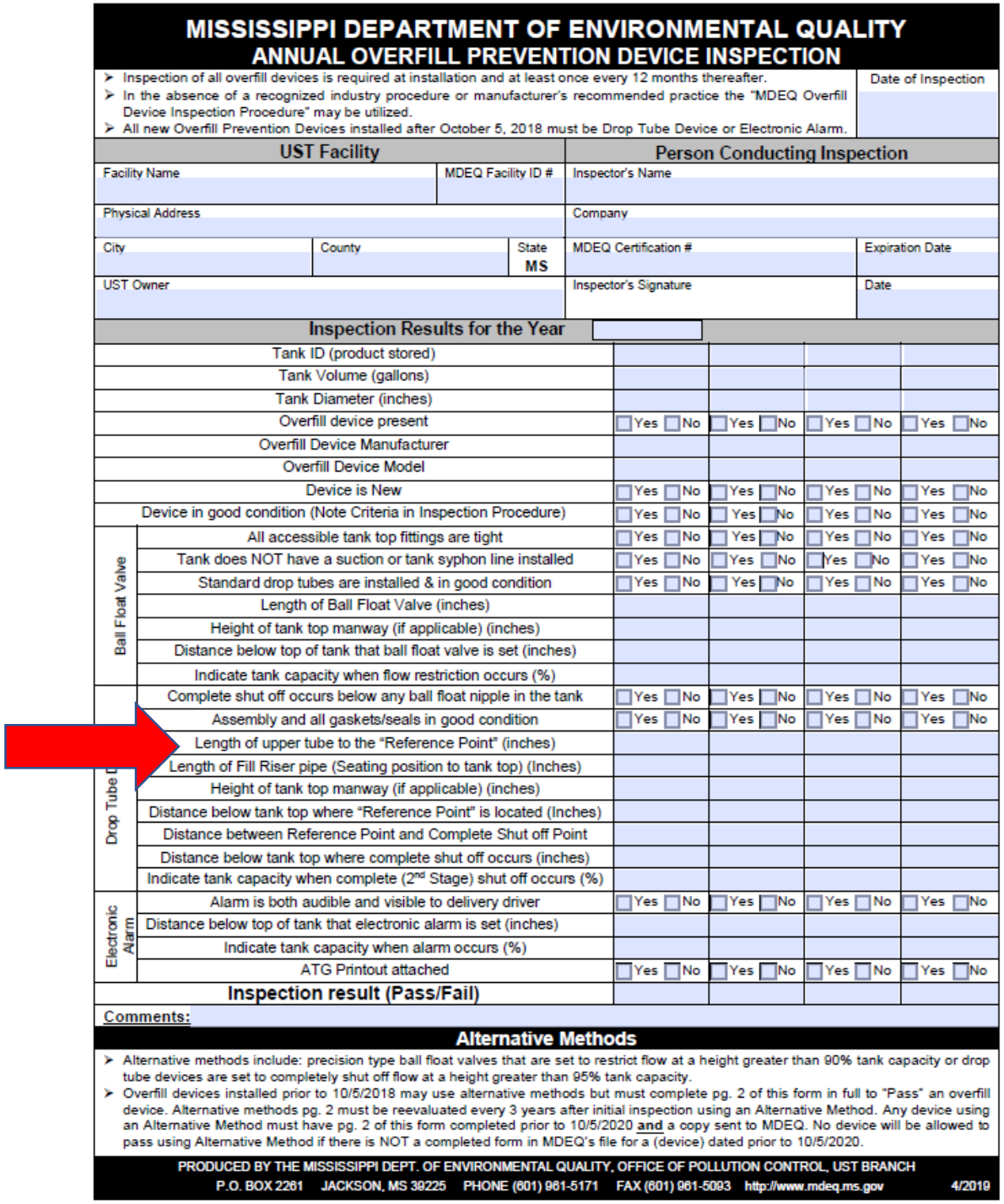
- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Length of upper tube to “Reference Point”?

- “Reference Point” is the point that you measure to on device.
- The 95% mark on device.
  - EBW Auto Limiter
  - Emco Wheaton A1100
  - Franklin Defender
- OPW
  - Reference Point is the upper seam.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year					
Tank ID (product stored)					
Tank Volume (gallons)					
Tank Diameter (inches)					
Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Overfill Device Manufacturer					
Overfill Device Model					
Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Length of Ball Float Valve (inches)					
Ball Float Valve: Height of tank top manway (if applicable) (inches)					
Ball Float Valve: Distance below top of tank that ball float valve is set (inches)					
Ball Float Valve: Indicate tank capacity when flow restriction occurs (%)					
Drop Tube: Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube: Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube: Length of upper tube to the “Reference Point” (inches)					
Drop Tube: Length of Fill Riser pipe (Seating position to tank top) (Inches)					
Drop Tube: Height of tank top manway (if applicable) (inches)					
Drop Tube: Distance below tank top where “Reference Point” is located (Inches)					
Drop Tube: Distance between Reference Point and Complete Shut off Point					
Drop Tube: Distance below tank top where complete shut off occurs (inches)					
Drop Tube: Indicate tank capacity when complete (2nd Stage) shut off occurs (%)					
Electronic Alarm: Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Electronic Alarm: Distance below top of tank that electronic alarm is set (inches)					
Electronic Alarm: Indicate tank capacity when alarm occurs (%)					
Electronic Alarm: ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Inspection result (Pass/Fail)					

Comments:

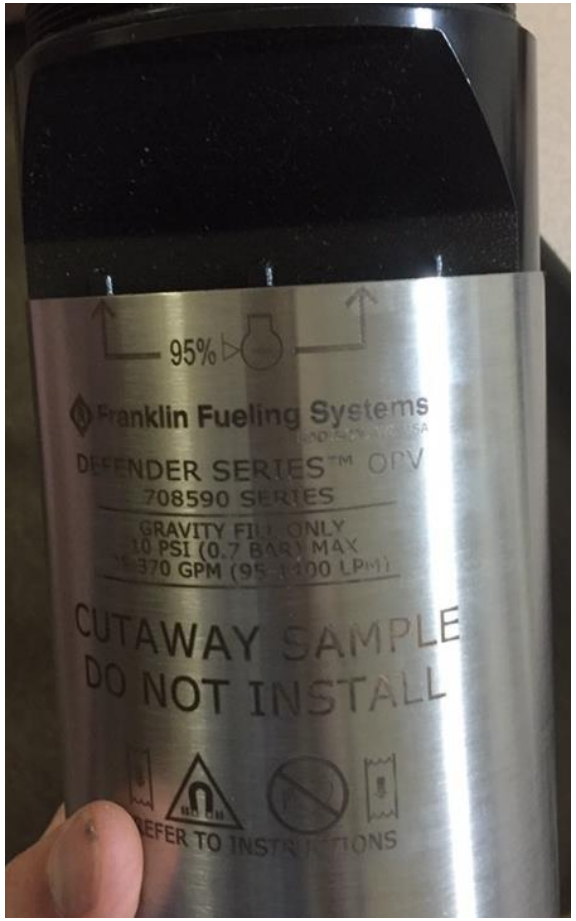
Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

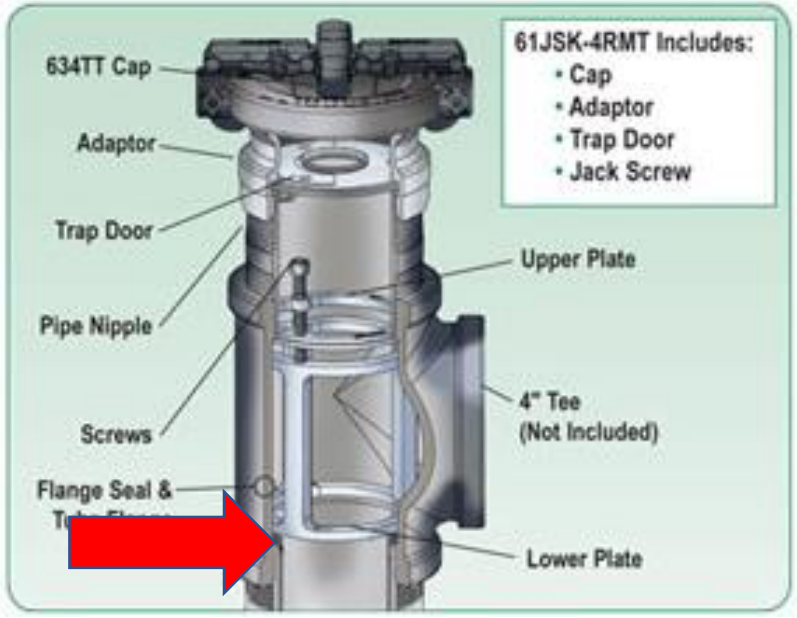
"Reference Point" Examples



Annual Overfill Prevention Device Inspection

Length of fill riser pipe (Seating Position to tank top)?

- Seating position is:
  - Typically top of fill pipe.
- Depending on construction it may not be.
- Wherever the upper tube sits is the “Seating Position”. May be lower in fill pipe. (Jack Screw Kit)



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year									
	Tank ID (product stored)								
	Tank Volume (gallons)								
	Tank Diameter (inches)								
	Overfill device present	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Overfill Device Manufacturer								
	Overfill Device Model								
	Device is New	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Device in good condition (Note Criteria in Inspection Procedure)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
Ball Float Valve	All accessible tank top fittings are tight	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Tank does NOT have a suction or tank syphon line installed	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Standard drop tubes are installed & in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Length of Ball Float Valve (inches)								
	Height of tank top manway (if applicable) (inches)								
	Distance below top of tank that ball float valve is set (inches)								
	Indicate tank capacity when flow restriction occurs (%)								
Drop Tube	Complete shut off occurs below any ball float nipple in the tank	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Assembly and all gaskets/seals in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Length of upper tube to the "Reference Point" (inches)								
	Length of Fill Riser pipe (Seating position to tank top) (Inches)								
	Height of tank top manway (if applicable) (inches)								
	Distance below tank top where "Reference Point" is located (Inches)								
	Distance between Reference Point and Complete Shut off Point								
	Distance below tank top where complete shut off occurs (inches)								
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)								
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Distance below top of tank that electronic alarm is set (inches)								
	Indicate tank capacity when alarm occurs (%)								
	ATG Printout attached	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No				
	Inspection result (Pass/Fail)								

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Height of Tank Top Manway?

- Typically you will never see this.
- If DT is installed in one of these risers you must measure height of tank top manway.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year					
Tank ID (product stored)					
Tank Volume (gallons)					
Tank Diameter (inches)					
Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Overfill Device Manufacturer					
Overfill Device Model					
Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Ball Float Valve: Length of Ball Float Valve (inches)					
Ball Float Valve: Height of tank top manway (if applicable) (inches)					
Ball Float Valve: Distance below top of tank that ball float valve is set (inches)					
Ball Float Valve: Indicate tank capacity when flow restriction occurs (%)					
Drop Tube Device: Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Drop Tube Device: Length of upper tube to the "Reference Point" (inches)					
Drop Tube Device: Length of Fill Riser pipe (Seating position to tank top) (Inches)					
Drop Tube Device: Height of tank top manway (if applicable) (inches)					
Drop Tube Device: Distance below tank top where "Reference Point" is located (Inches)					
Drop Tube Device: Distance between Reference Point and Complete Shut off Point					
Drop Tube Device: Distance below tank top where complete shut off occurs (inches)					
Drop Tube Device: Indicate tank capacity when complete (2nd Stage) shut off occurs (%)					
Electronic Alarm: Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Electronic Alarm: Distance below top of tank that electronic alarm is set (inches)					
Electronic Alarm: Indicate tank capacity when alarm occurs (%)					
Electronic Alarm: ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	
Inspection result (Pass/Fail)					

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Distance Below tank top where “Reference Point” is located?

- Form is setup as a worksheet:

36”	44
- 30”	- 30”
6”	- 4.5”
	9.5”

**This may or may not be point of complete shut off.

For OPW 61 & 71 SOs:

This number must be 6.5” or greater.

Inspection Results for the Year					
Tank ID (product stored)		Regular	Premium	Hwy Diesel	Off Road Diesel
Tank Volume (gallons)					
Tank Diameter (inches)		96	96	96	96
Overfill device present		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Overfill Device Manufacturer		EBW	Emco	OPW	OPW
Overfill Device Model		Auto Limiter	A1100	61 SO	71 SO
Device is New		□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Ball Float Valve	All accessible tank top fittings are tight	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Tank does NOT have a suction or tank syphon line installed	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Standard drop tubes are installed & in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Length of Ball Float Valve (inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
Device	Complete shut off occurs below any ball float nipple in the tank	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Assembly and all gaskets/seals in good condition	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Length of upper tube to the “Reference Point” (inches)	36	44	36.5	39.5
	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30	30	30	30
	Height of tank top manway (if applicable) (inches)	0	4.5	0	0
	Distance below tank top where “Reference Point” is located (Inches)	6	9.5	6.5	9.5
	Distance between Reference Point and Complete Shut off Point				
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Inspection result (Pass/Fail)					

Annual Overfill Prevention Device Inspection

Distance between Reference point and Complete Shut Off Point?

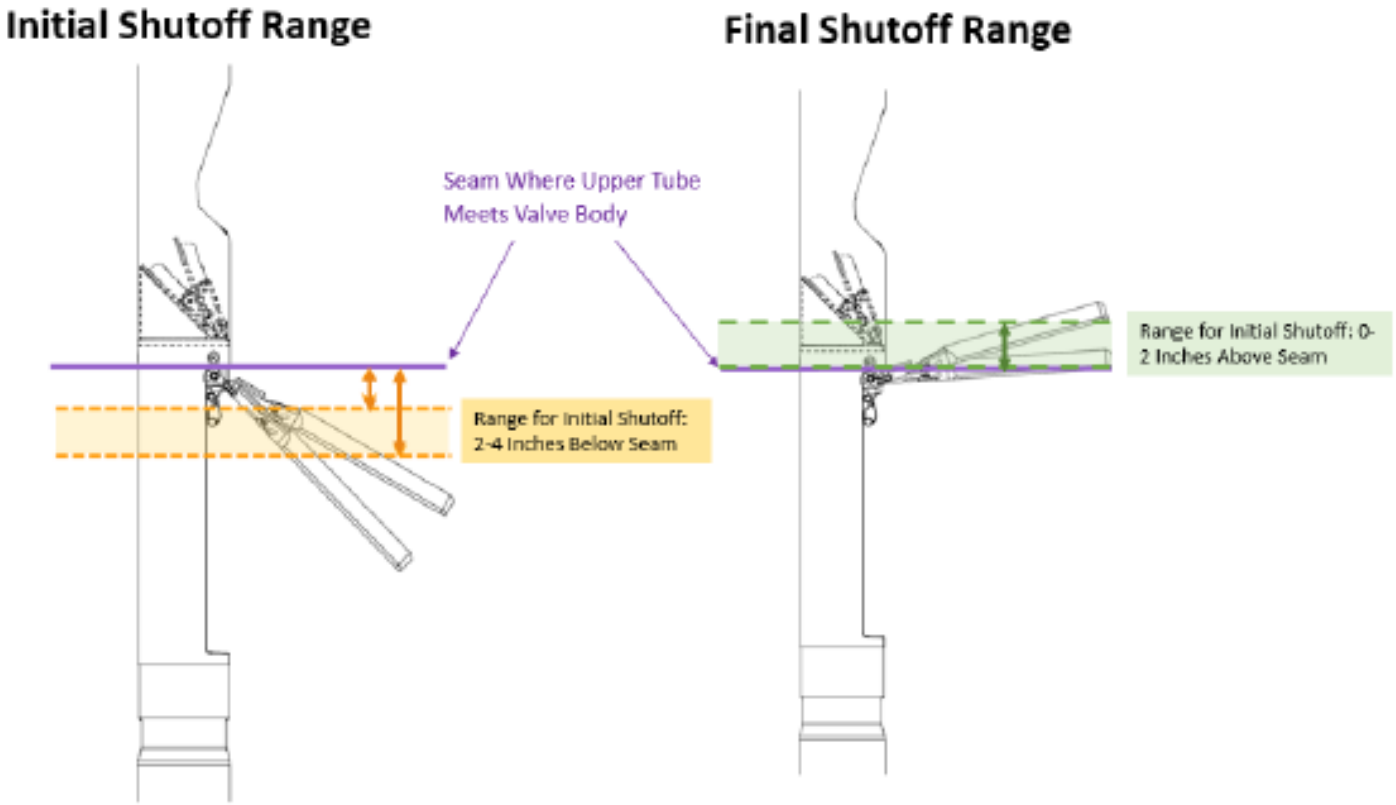
- Overfill Drop tubes marked by 95%.
  - The mark is both the Reference Point & Complete Shut Off Point.
  - Difference is 0 inches.
- Overfill Drop tubes not marked? (OPW)
  - The Reference point is the seam.
  - The Complete Shut Off Point is 1.5” above that.
  - The difference is 1.5 inches.

**If 95% not marked on device see manufacturer’s instructions.

Inspection Results for the Year					
Tank ID (product stored)		Regular	Premium	Hwy Diesel	Off Road Diesel
Tank Volume (gallons)					
Tank Diameter (inches)		96	96	96	96
Overfill device present		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Overfill Device Manufacturer		EBW	Emco	OPW	OPW
Overfill Device Model		Auto Limiter	A1100	61 SO	71 SO
Device is New		□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Ball Float Valve	All accessible tank top fittings are tight	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Tank does NOT have a suction or tank syphon line installed	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Standard drop tubes are installed & in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Length of Ball Float Valve (inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
be Device	Complete shut off occurs below any ball float nipple in the tank	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Assembly and all gaskets/seals in good condition	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Length of upper tube to the “Reference Point” (inches)	36	44	36.5	39.5
	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30	30	30	30
	Height of tank top manway (if applicable) (inches)	0	4.5	0	0
	Distance below tank top where “Reference Point” is located (Inches)	6	9.5	6.5	9.5
	Distance between Reference Point and Complete Shut off Point	0	0	1.5	1.5
	Distance below tank top where complete shut off occurs (inches)				
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
nic	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No

Annual Overfill Prevention Device Inspection

OPW 61 & 71 SO Complete Shut Off Point?



- OPW recently published modified instructions to indicate where complete shut off occurs.
- Instructions indicate that complete shut off occurs 1.5 inches above the seam.

****Note:** Diagram provided by OPW is mislabeled but it shows the 2 stages of the device.

Appendix C

HOW TO LOCATE THE POSITION OF THE 71SO FOR COMPLETE SHUT-OFF AT A GIVEN TANK CAPACITY

Note: This Appendix only applies when AHJ requirements call for complete shut-off at a given tank capacity. See page 4 for standard measurements.

The length of the upper tube and the placement of the 71SO valve body determine the shut-off point. The sample calculation below will provide for complete shut-off at 95%. In all cases, the upper tube length must be a minimum of 6-1/2" plus the length of the riser pipe. All length measurements are in inches.

INSTRUCTIONS

1. Find the tank capacity (in gallons) from the tank calibration chart provided by the tank manufacturer.
2. Calculate 95% of capacity.
3. Locate the 95% volume number on the tank calibration chart.
4. Find the dipstick number (X) which corresponds to the 95% tank volume. And, find the dipstick number (Y) which corresponds to the 100% volume.
5. Subtract the dipstick number (X) from the tank diameter (Y) to find the upper tube reference number (Z).
   (Y) - (X) = (Z)
6. Add 1.5" to (Z) to find the upper tube depth E.
   (Z) + 1.5" = E
7. Is E less than 6-1/2"?

NO Upper tube length is E plus the distance from the top of the Face Seal Adaptor installed on the riser pipe to the inside, top lip of the storage tank (A).

Upper Tube Length = E + (A)

For testable models only, ending in "T":
Upper Tube Length = E + (A) – 1-1/2"

YES Upper tube length is 6-1/2" plus the riser pipe measurement (A).

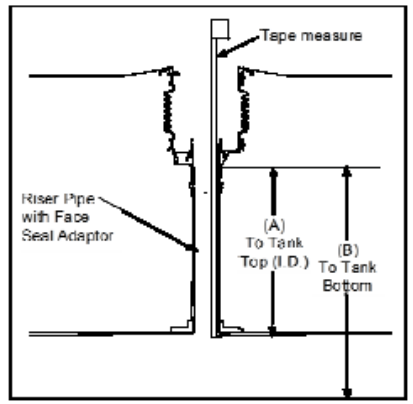
Upper Tube Length = 6-1/2" + (A)

For testable models only, ending in "T":
Upper Tube Length = 6-1/2" + (A) – 1-1/2"

NOTE: You must find the actual tank capacity number that correlates to the 6-1/2" + (A) depth for the station records. This number may also be used or the purposes of calibrating an electronic tank level system.

EXAMPLE

1. For an Owens-Corning Model G-3 Fiberglass® Tank Calibration Chart:
   Tank Capacity - 10,000 gal., nominal 9,403 gal.
   NOTE: Use actual capacity only



2. 95% of actual tank capacity = 0.95 x 9403 gal. = 8933 gal.
3. The closest number which is less than 8933 gal. Is 8910 gal. Choosing the closest number less than 95% of actual capacity ensures that complete shutoff will occur when the tank is no more than 95% full.
4. The calibration chart reading of 8910 gal. corresponds to a dipstick measurement of 82".
5. Dipstick number (X) = 82"
   Tank diameter (Y) = 92"
   (Y) - (X) = (Z) (92 "- 82" = 10")
   (Z) = 10"
6. (Z) + 1.5" = E (10" + 1.5" = 11.5")
   E = 11.5"
7. Is 11.5" less than 6-1/2"?

NO Measure the distance from the top of the FSA-400 Face Seal Adaptor installed on the riser pipe to the inside, top lip of the storage tank and obtain measurement (A).

Upper tube length = E + (A)

For testable models only, ending in "T":
Upper Tube Length = E + (A) – 1-1/2"

71SO Overfill Valve in Tank Complete Shut Off Level Worksheet

Important: This is meant to be supplemental worksheet and not a substitute to following the installation manual instructions. All length measurements are in inches. Please contact the Authority Having Jurisdiction (AHJ) and review local, state, and national codes to determine the regulatory requirements governing shut-off capacity in your region, as well as take into account other considerations such as extreme tank tilt.

Take the following measurements with the valve installed in the tank:

Distance from the 71SO inlet tube flange to the cast lug in the 71SO body (see figures), upper tube length.
Note: the Upper Tube Length must be at least 16" to include the protective bend in the tube.

(D) = _____

Distance from the 71SO inlet tube flange to the top and bottom of lower tube, valve length.
(W) = _____
(U) = _____

Distance from the 71SO inlet tube flange to the bottom of the tank. Note: If a tank bottom protector is present it may be necessary to add this thickness to dimension (OPW 6111 & 61TP models add 0.6")
(B) = _____

From the tank calibration chart provided by tank manufacturer find the dipstick number (Y) which corresponds to the 100% volume.
(Y) = _____

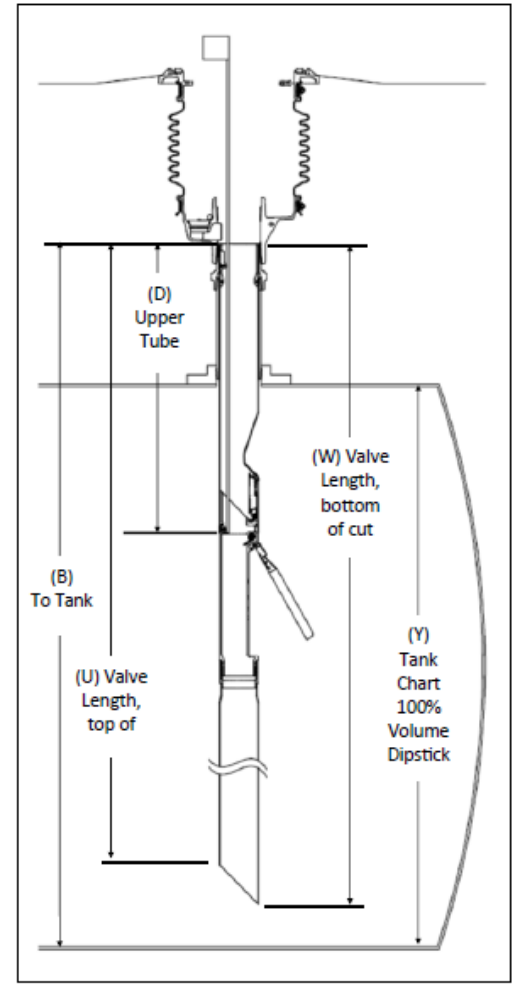
1. To determine complete shut-off percentage:
Subtract upper tube length (D) from distance to tank bottom (B)
(X) = (B) – (D) + 1.5" = _____

Using the tank calibration chart provided by the tank manufacturer determine the tank capacity at the calculated (X) dimension and the 100% volume (Y) tank capacity.

(X) tank capacity in gallons = _____

(Y) tank capacity in gallons = _____

Complete SO% = (X) capacity / (Y) capacity x100 =
_____



Note: The overfill valve must be installed per AHJ requirements and all applicable local, state, and national codes. If the overfill valve is set above the allowable shut-off percentage the overfill valve must be removed and replaced.

Note: This Appendix only applies to valves installed per Appendix C. See Appendix B for the standard valve installation tank shut off level worksheet.

Annual Overfill Prevention Device Inspection

Distance below tank top where complete shut off occurs?

- This is the number to use to determine 95%
- OPW Examples:

6.5”	9.5”
- 1.5”	- 1.5”
5”	8”

- Both OPWs FAIL
  - Can they be passed?
    - Only by using Alternative rule. Pg. 2

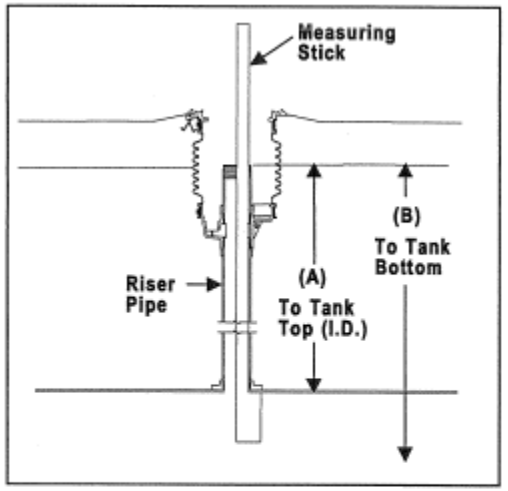
Inspection Results for the Year					
	Tank ID (product stored)	Regular	Premium	Hwy Diesel	Off Road Diesel
	Tank Volume (gallons)				
	Tank Diameter (inches)	96	96	96	96
	Overfill device present	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Overfill Device Manufacturer	EBW	Emco	OPW	OPW
	Overfill Device Model	Auto Limiter	A1100	61 SO	71 SO
	Device is New	☐Yes ■No	☐Yes ■No	☐Yes ■No	☐Yes ■No
	Device in good condition (Note Criteria in Inspection Procedure)	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
p Tube Device	Complete shut off occurs below any ball float nipple in the tank	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
p Tube Device	Assembly and all gaskets/seals in good condition	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
p Tube Device	Length of upper tube to the “Reference Point” (inches)	36	44	36.5	39.5
p Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30	30	30	30
p Tube Device	Height of tank top manway (if applicable) (inches)	0	4.5	0	0
p Tube Device	Distance below tank top where “Reference Point” is located (Inches)	6	9.5	6.5	9.5
p Tube Device	Distance between Reference Point and Complete Shut off Point	0	0	1.5	1.5
p Tube Device	Distance below tank top where complete shut off occurs (inches)	6	9.5	5	8
p Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%	95%	98%	96%
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)	Fail	PASS	Fail	Fail

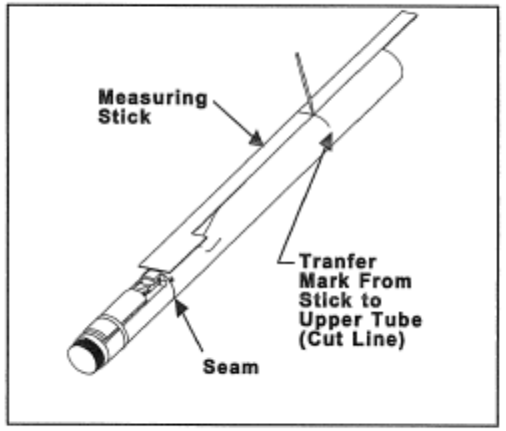
Annual Overfill Prevention Device Inspection

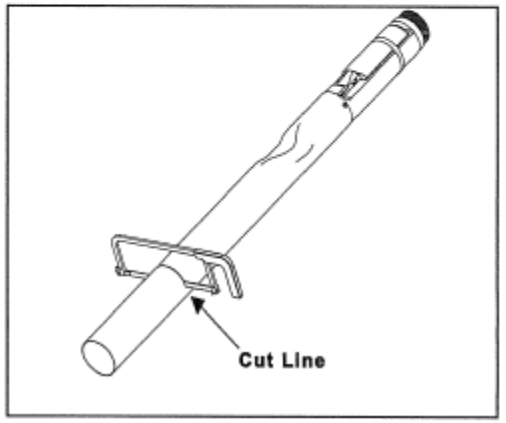
How common is it that a drop tube is not set at 95%?

- You should expect it at every site.
- Appendix C wasn't published in OPW's instructions until June 2018.
- With OPW's clarification, the majority out there are not set at 95%.
  - Many have seam set at 6.5" below tank top.
    - Used the paper guide to cut upper tube.
  - Many have seam set at 9.5" below tank top.
    - Was not made aware of where complete shut off occurs at.
- If not at 95%, it fails unless you use pg. 2 and prove Alternative rule.

**Note this issue is not limited to OPW. Many dual float valves are also set at 5.5" below tank top, not at 95%.

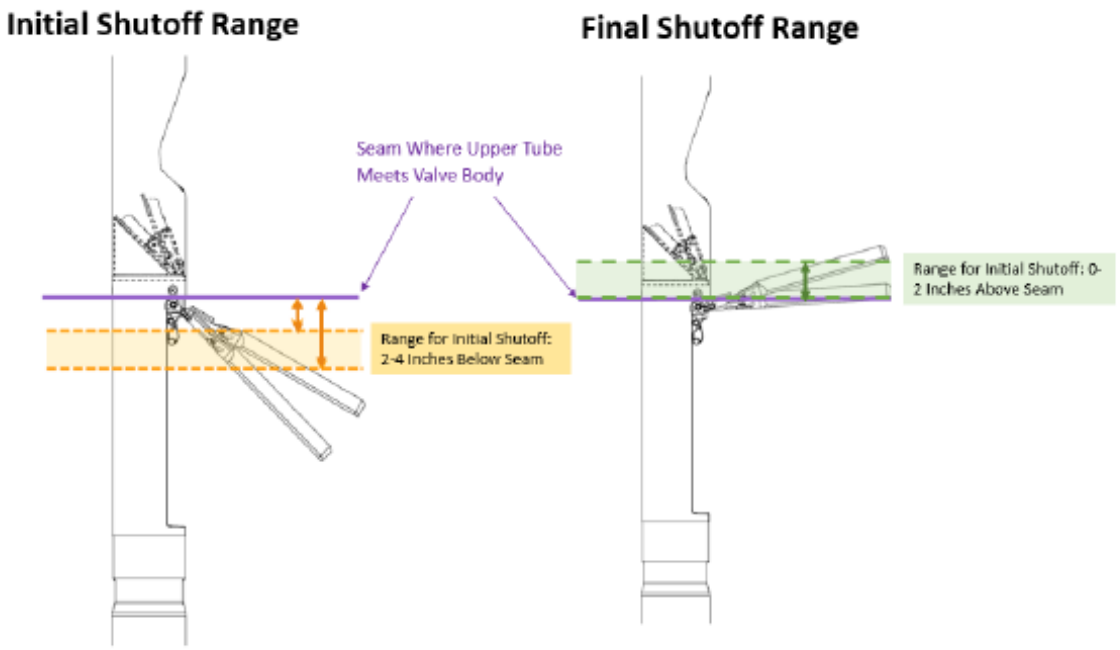






Annual Overfill Prevention Device Inspection

Why all the confusion?

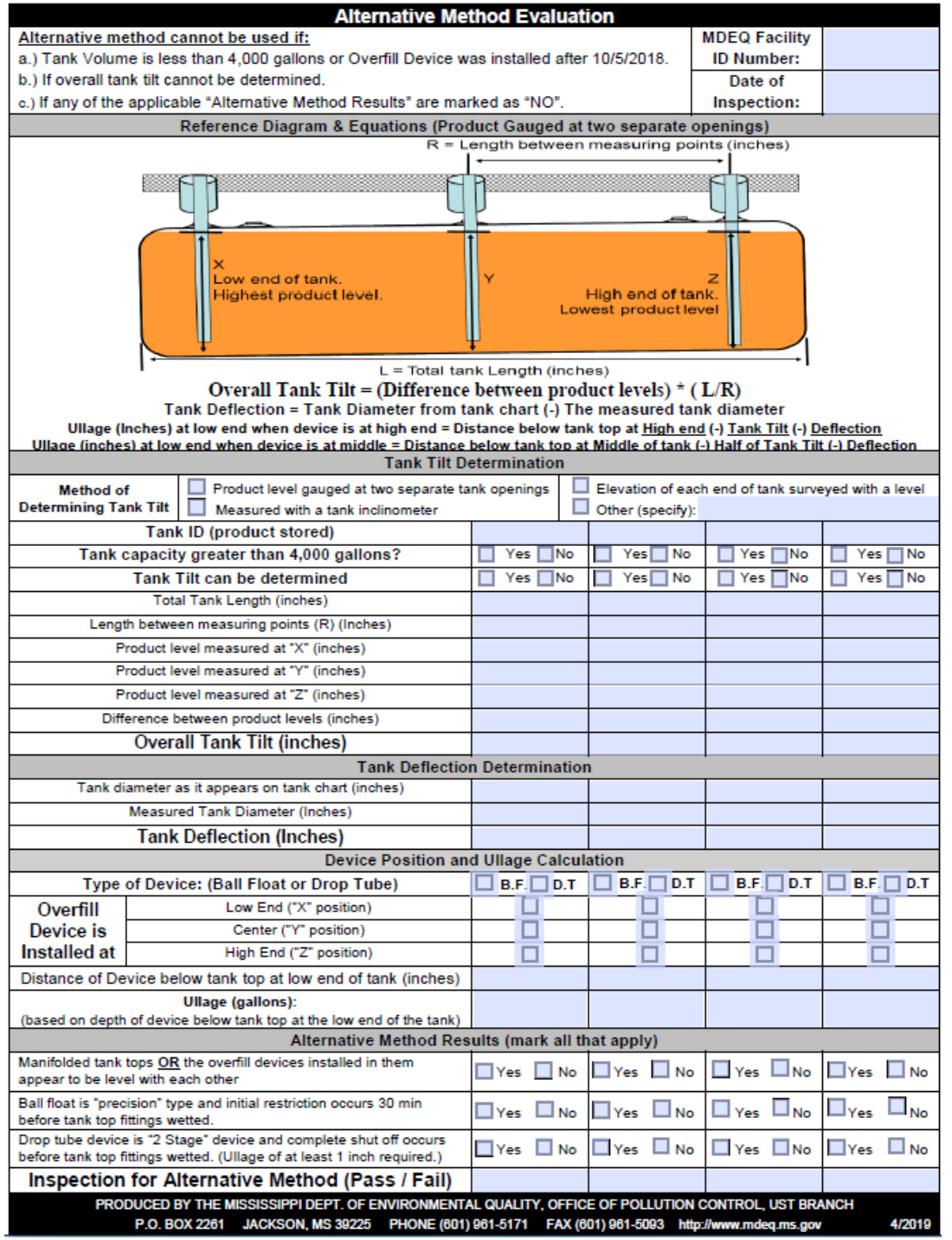


- Federal & State regulations allowed for use of alternative rule since 1988.
- Alternative rule for drop tubes being all tank top fittings not being wetted.
- Manufacturers “previous” instructions may have capitalized on this rule by making instructions to meet alternative rule instead of informing where 95% is.
- Following previous instructions, yes your device likely will shut off at 98% but what is NOT taken into account here?
  - Tilt & Deflection

Annual Overfill Prevention Device Inspection

MDEQ Alternative Method pg. 2

- MDEQ removed “Alternative Method” from regulations 10/5/18.
- All new drop tube devices installed after 10/5/18 required to be installed at 95% in MS.
  - Pg. 2 is an allowance for existing devices
  - Form must be completed by 10/5/2020 for each device.
  - Copy should be sent to me by email to file.
- Its not as bad as it seems…..
  - Pg. 2 only has to be confirmed every 3 years.
- What is MDEQ going to want to see when they inspect?
  - Last Annual OF inspection (within past year).
  - Last OF inspection where pg. 2 was evaluated (up to 3 years old)



Alternative Method Evaluation

Alternative method cannot be used if:
a.) Tank Volume is less than 4,000 gallons or Overfill Device was installed after 10/5/2018.
b.) If overall tank tilt cannot be determined.
c.) If any of the applicable “Alternative Method Results” are marked as “NO”.

MDEQ Facility ID Number:
Date of Inspection:

Reference Diagram & Equations (Product Gauged at two separate openings)

R = Length between measuring points (inches)

X
Low end of tank.
Highest product level.

Y

Z
High end of tank.
Lowest product level

L = Total tank Length (inches)

Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt: ☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer ☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):

Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (Inches)				
Product level measured at “X” (inches)				
Product level measured at “Y” (inches)				
Product level measured at “Z” (inches)				
Difference between product levels (inches)				
Overall Tank Tilt (inches)				

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End (“X” position)	☐	☐	☐	☐
	Center (“Y” position)	☐	☐	☐	☐
	High End (“Z” position)	☐	☐	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Alternative Method Results (mark all that apply)

Manifolded tank tops OR the overfill devices installed in them appear to be level with each other	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is “precision” type and initial restriction occurs 30 min before tank top fittings wetted.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is “2 Stage” device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)				

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Lets be clear….

- On pg. 1 you have a choice.
- If device is not at 95% you can
  - Fail it
  - Attempt to use pg. 2 to Pass it
- It is your choice.

- If tank has both a Ball Float and a drop tube you have the same choice.

Inspection Results for the Year					
	Tank ID (product stored)	Regular	Premium	Hwy Diesel	Off Road Diesel
	Tank Volume (gallons)				
	Tank Diameter (inches)	96	96	96	96
	Overfill device present	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
	Overfill Device Manufacturer	EBW	Emco	OPW	OPW
	Overfill Device Model	Auto Limiter	A1100	61 SO	71 SO
	Device is New	☐Yes ■No	☐Yes ■No	☐Yes ■No	☐Yes ■No
	Device in good condition (Note Criteria in Inspection Procedure)	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Drop Tube Device	Assembly and all gaskets/seals in good condition	■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)	36	44	36.5	39.5
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30	30	30	30
Drop Tube Device	Height of tank top manway (if applicable) (inches)	0	4.5	0	0
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)	6	9.5	6.5	9.5
Drop Tube Device	Distance between Reference Point and Complete Shut off Point	0	0	1.5	1.5
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)	6	9.5	5	8
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%	95%	98%	96%
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)	Fail	PASS	Fail	Fail

Annual Overfill Prevention Device Inspection

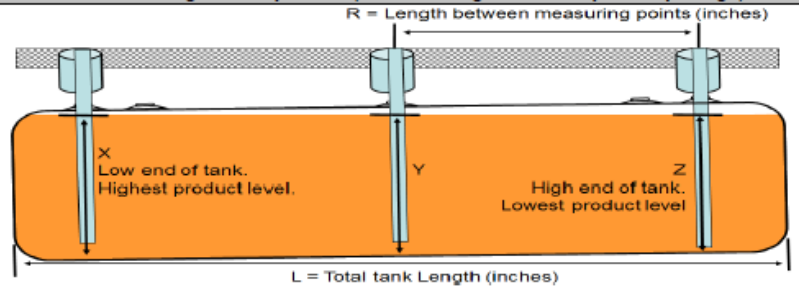
- MDEQ Alternative Method pg. 2
  - Pg. 2 is not always 100% accurate.
  - It is a VERY good conservative estimate.
  - Until something better comes out this is what it is. A way to document Alternative Method
- In general:
  - It takes a lot of tilt or deflection to NOT pass a device. (5” or more)
  - Most drop tube devices do pass.
- Now lets simplify this…

Alternative Method Evaluation

Alternative method cannot be used if:
a.) Tank Volume is less than 4,000 gallons or Overfill Device was installed after 10/5/2018.
b.) If overall tank tilt cannot be determined.
c.) If any of the applicable “Alternative Method Results” are marked as “NO”.

MDEQ Facility ID Number:
Date of Inspection:

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)
Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter
Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection
Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt: ☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer ☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):

Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (Inches)				
Product level measured at “X” (inches)				
Product level measured at “Y” (inches)				
Product level measured at “Z” (inches)				
Difference between product levels (inches)				
Overall Tank Tilt (inches)				

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End (“X” position)	☐	☐	☐	☐
	Center (“Y” position)	☐	☐	☐	☐
	High End (“Z” position)	☐	☐	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Alternative Method Results (mark all that apply)

Manifolded tank tops OR the overfill devices installed in them appear to be level with each other	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is “precision” type and initial restriction occurs 30 min before tank top fittings wetted.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is “2 Stage” device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)				

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

MDEQ Alternative Method pg. 2

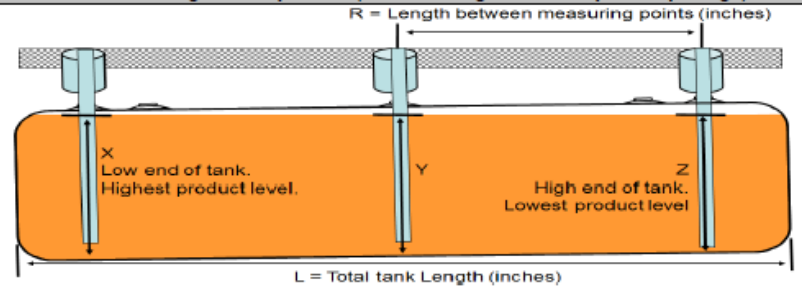
- First, you do need an “accurate” tank chart.
- If:
  - Tank capacity < or = 4,000 gallons
  - Tank tilt can’t be determined.
    - The Device automatically FAILS. Don’t go any further on pg. 2 wasting your time
- Method of determining tank tilt:
  - Fuel level gauged at 2 different openings (ideal)
  - Inclinometer – For single opening.
    - Be prepared to be asked about your Inclinometer (we haven’t found one on the market)
  - Elevation of tank ends surveyed with a level. (May not be appropriate to use if tank is deflected)
    - No it doesn’t require a surveyor
    - Gently probe down to tank top at both ends.
    - Rods should be the same length.
    - Measure difference in elevation between the rods

Alternative Method Evaluation

Alternative method cannot be used if:
a.) Tank Volume is less than 4,000 gallons or Overfill Device was installed after 10/5/2018.
b.) If overall tank tilt cannot be determined.
c.) If any of the applicable “Alternative Method Results” are marked as “NO”.

MDEQ Facility ID Number:
Date of Inspection:

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt: ☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer ☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):

Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (Inches)				
Product level measured at “X” (inches)				
Product level measured at “Y” (inches)				
Product level measured at “Z” (inches)				
Difference between product levels (inches)				
Overall Tank Tilt (inches)				

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End (“X” position)	☐	☐	☐	☐
	Center (“Y” position)	☐	☐	☐	☐
	High End (“Z” position)	☐	☐	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Alternative Method Results (mark all that apply)

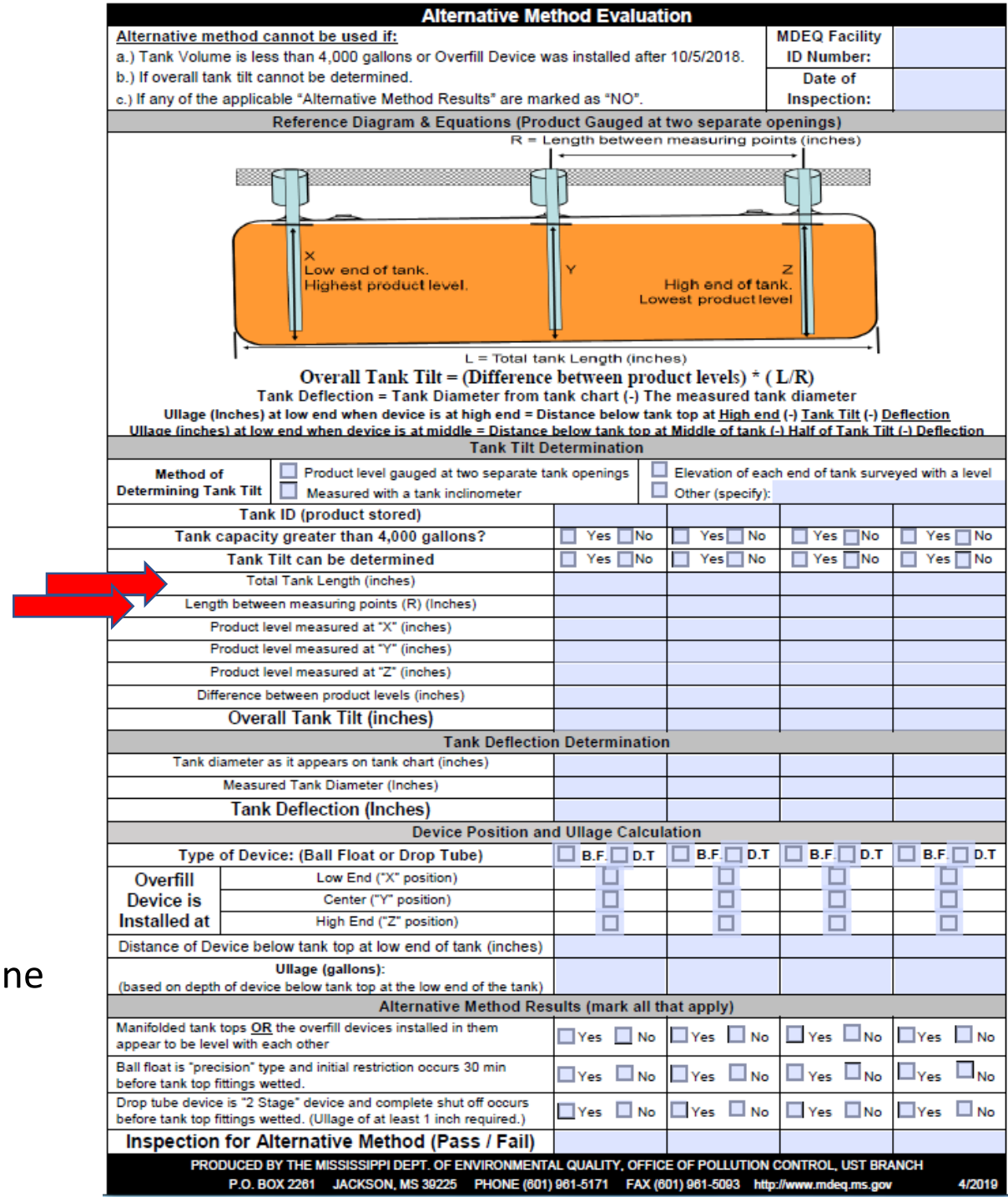
Manifolded tank tops OR the overfill devices installed in them appear to be level with each other	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is “precision” type and initial restriction occurs 30 min before tank top fittings wetted.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is “2 Stage” device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)				

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

MDEQ Alternative Method pg. 2

- Total tank length (L)
  - Comes from tank chart. Not what you estimate
- Length between measuring points (R)
  - Depends on method used.
  - Fuel level gauged at 2 different openings
    - (R) is the length between your riser pipes.
    - Choose risers further away for better accuracy
  - Inclinometer
    - (R) doesn't apply, should be left blank.
    - MDEQ equation to calculate tilt does not work.
    - There should be an equation of some kind to determine overall tank tilt
  - Elevation of tank ends surveyed with a level.
    - (R) is the length between your probe rods



Alternative Method Evaluation

Alternative method cannot be used if:
a.) Tank Volume is less than 4,000 gallons or Overfill Device was installed after 10/5/2018.
b.) If overall tank tilt cannot be determined.
c.) If any of the applicable "Alternative Method Results" are marked as "NO".

MDEQ Facility ID Number:
Date of Inspection:

Reference Diagram & Equations (Product Gauged at two separate openings)

R = Length between measuring points (inches)

X Low end of tank. Highest product level. Y Z High end of tank. Lowest product level

L = Total tank Length (inches)

Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt: ☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer ☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):

Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (inches)				
Product level measured at "X" (inches)				
Product level measured at "Y" (inches)				
Product level measured at "Z" (inches)				
Difference between product levels (inches)				
Overall Tank Tilt (inches)				

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				

Device Position and Ullage Calculation

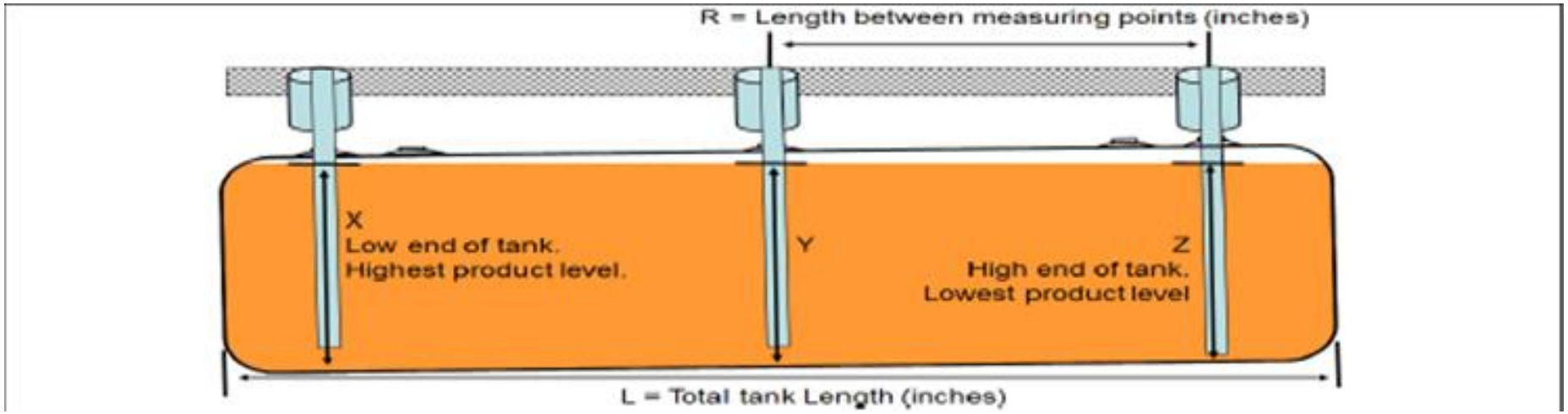
Type of Device: (Ball Float or Drop Tube)	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	
Overfill Device is Installed at	Low End ("X" position)	☐	☐	☐	☐
	Center ("Y" position)	☐	☐	☐	☐
	High End ("Z" position)	☐	☐	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Alternative Method Results (mark all that apply)

Manifolded tank tops OR the overfill devices installed in them appear to be level with each other	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is "precision" type and initial restriction occurs 30 min before tank top fittings wetted.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is "2 Stage" device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)				

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Comments:



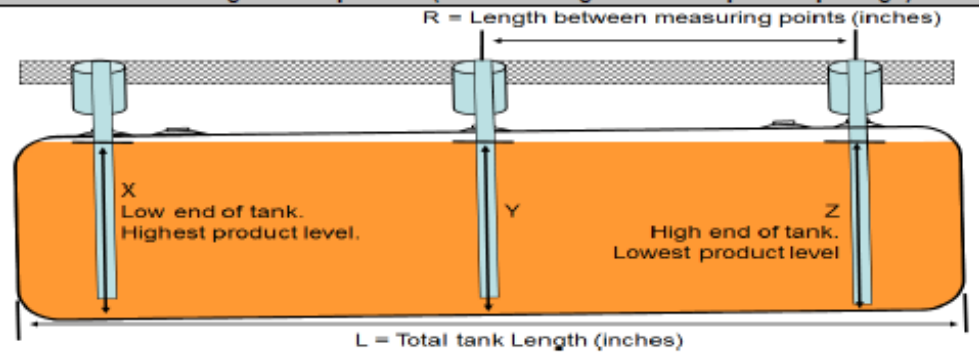
- If you have a choice between riser pipes.
- Use riser pipes that create the largest (R) value.
  - Easier to see the difference in fuel levels.
  - Easier to determine low / high end.
  - More accurate.

Annual Overfill Prevention Device Inspection

Low or High? What measurement goes where?

- You have to document where your measurements were taken. (unless using an inclinometer)
- If one of the measurements is taken close to the middle of the tank then it automatically is your (Y) location.
- Low or High? Use the diagram:
  - Fuel level gauged at 2 different openings:
    - X = low end of tank, has the highest fuel level
    - Z = high end of tank, has the lowest fuel level
  - Elevation of tank ends surveyed with a sight level:
    - X = low end of tank, rod lower in ground
    - Z = high end of tank, rod higher in ground
- What matters is:
  - The difference.
  - Where exactly is the device located? (High, low, middle)
- Ex. 48” & 49” = same difference 1”

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer ☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):			
Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (Inches)				
Product level measured at "X" (inches)	49"		49"	
Product level measured at "Y" (inches)	48"	49"		
Product level measured at "Z" (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)				

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End ("X" position)	☐	☐	☐	☐
	Center ("Y" position)	☐	☐	☐	☐
	High End ("Z" position)	☐	☐	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Annual Overfill Prevention Device Inspection

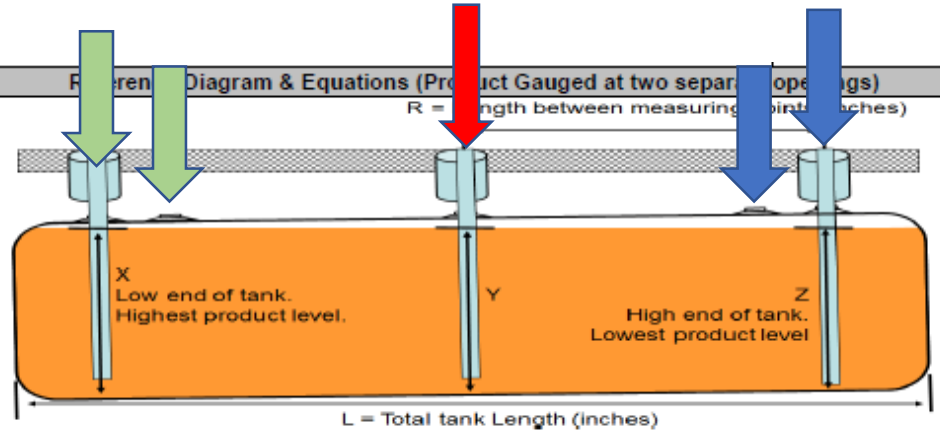
Now you should know where your device is located

- One of your measurements should be taken where the device is installed.

- If device is installed in the middle of the tank, it is at (Y) center
- If device is at high or low end.
  - Use Diagram to guide you.

    (Previous Slide)

- If your device is installed in either of these bungs, it is High end.
- If device is installed in either of these bungs, it is low end.



Overall Tank Tilt = (Difference between product levels) * (L/R)

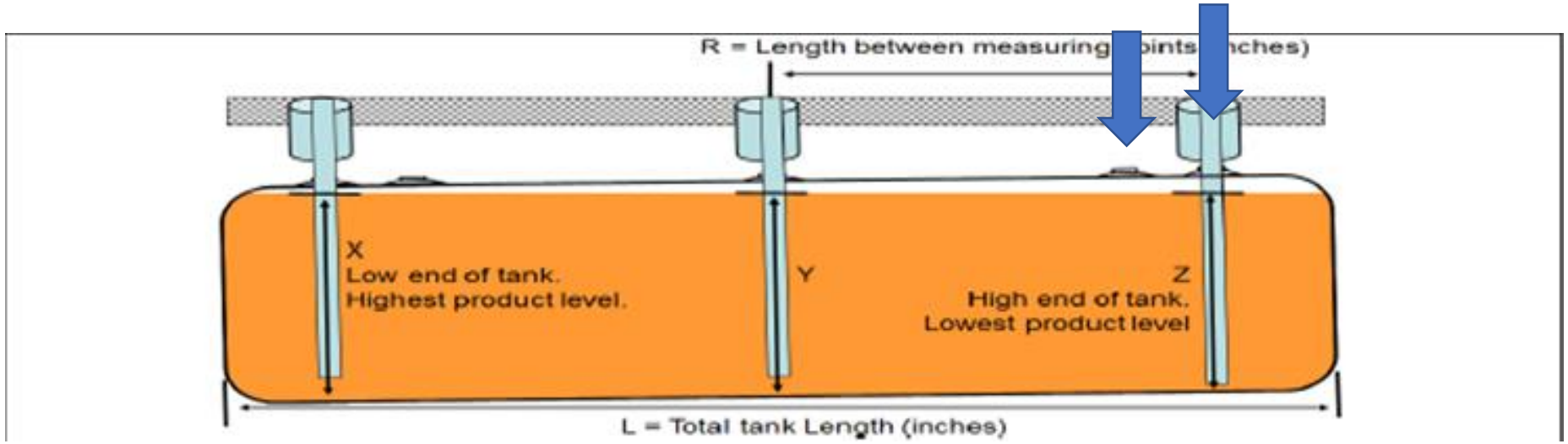
Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination				
Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer		☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):	
Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (Inches)				
Product level measured at "X" (inches)	49"		49"	
Product level measured at "Y" (inches)	48"	49"		
Product level measured at "Z" (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)				
Tank Deflection Determination				
Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				
Device Position and Ullage Calculation				
Type of Device: (Ball Float or Drop Tube)	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at: Low End ("X" position)	☐	☐	■	☐
Overfill Device is Installed at: Center ("Y" position)	■	☐	☐	☐
Overfill Device is Installed at: High End ("Z" position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)				
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)				

Comments:



➡ If your only accessible riser pipes at one end of tank. (Example above)

- Your device is NOT at the middle (Y). It is high end.

  Even though you document one of the fuel measurements as (Y).

Device Position and Ullage Calculation					
Type of Device: (Ball Float or Drop Tube)		☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End ("X" position)	☐	☐	■	☐
	Center ("Y" position)	■	☐	☐	☐
	High End ("Z" position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

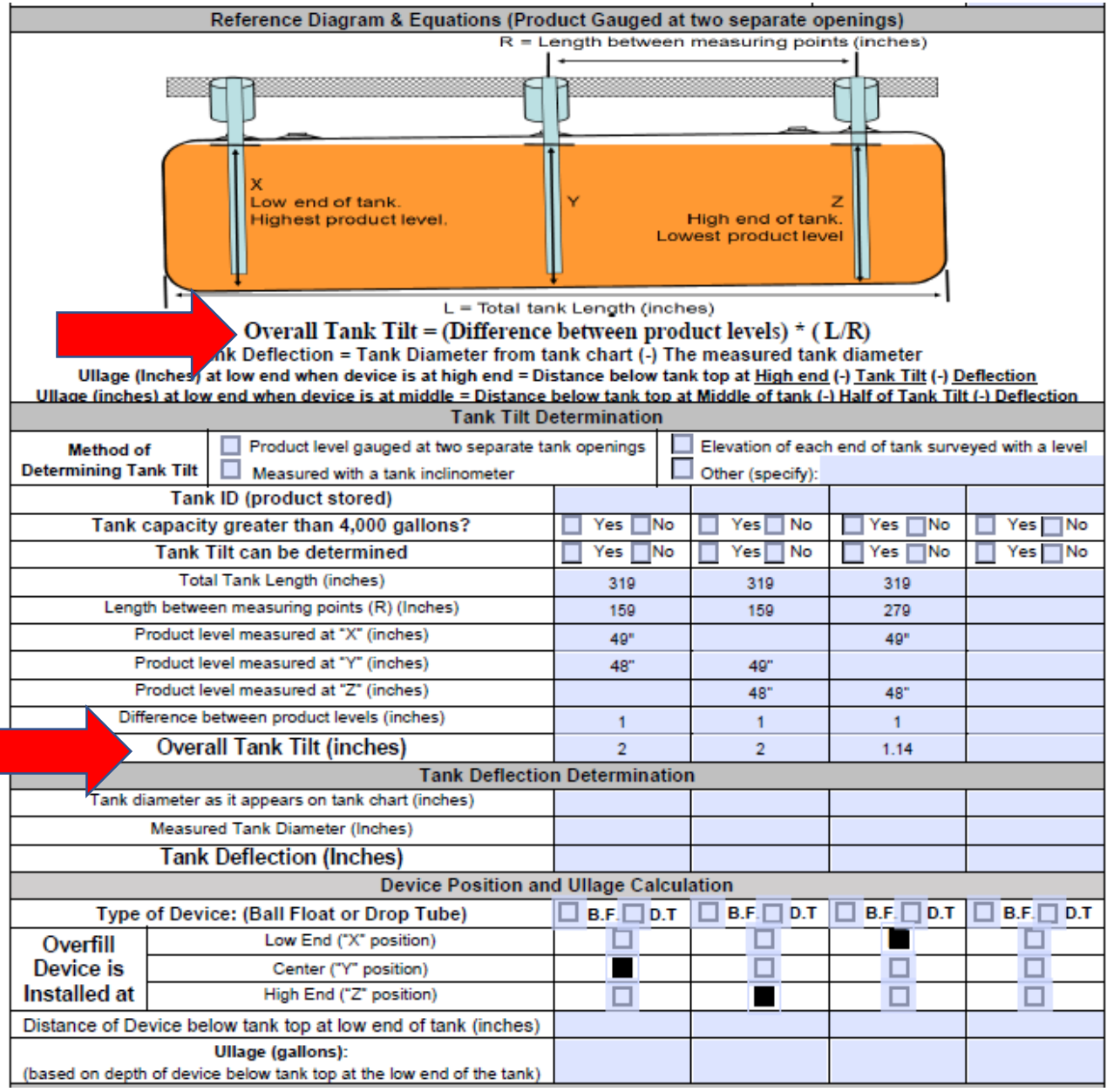
Annual Overfill Prevention Device Inspection

Overall Tank Tilt

- Critical values:
  - Total tank Length (L)
  - Length between measuring points (R)
- Same equation:

$$Overall\ Tilt = Difference\ * (\frac{L}{R})$$

- Ex:
  - 1” * $(\frac{319}{159})$ = 2 inches overall tilt
  - 1” * $(\frac{319}{279})$ = 1.14 inches overall tilt



Reference Diagram & Equations (Product Gauged at two separate openings)

Overall Tank Tilt = (Difference between product levels) * (L/R)

nk Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer	☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):		
Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)	319	319	319	
Length between measuring points (R) (Inches)	159	159	279	
Product level measured at "X" (inches)	49"		49"	
Product level measured at "Y" (inches)	48"	49"		
Product level measured at "Z" (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)	2	2	1.14	

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End ("X" position)	☐	☐	■	☐
	Center ("Y" position)	■	☐	☐	☐
	High End ("Z" position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Annual Overfill Prevention Device Inspection

Tank Deflection

- Straight forward:
  - Tank diameter from tank chart
  - Tank diameter measured
  - Take the difference. 96 – 95 = 1”

**Note: you should measure tank diameter at all available openings.

Take the smallest diameter measurement.

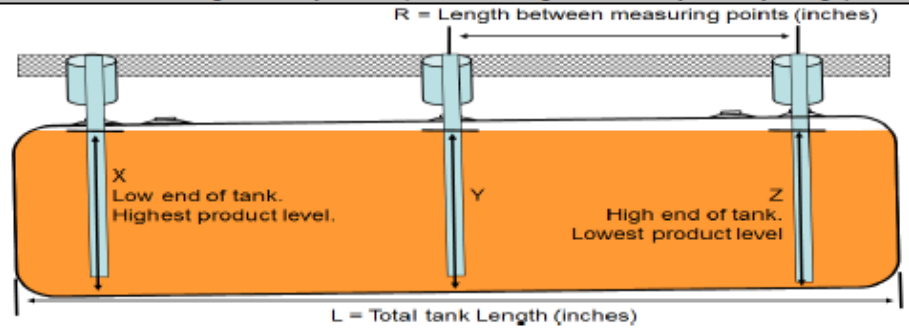
<u>Ex. You measure:</u>

95” and 94” from 2 different openings.

You should go with 94”.

This is worst case scenario.

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at <u>High end</u> (-) <u>Tank Tilt</u> (-) <u>Deflection</u>

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination				
Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer	☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):		
Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)	319	319	319	
Length between measuring points (R) (Inches)	159	159	279	
Product level measured at "X" (inches)	49"		49"	
Product level measured at "Y" (inches)	48"	49"		
Product level measured at "Z" (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)	2	2	1.14	
Tank Deflection Determination				
Tank diameter as it appears on tank chart (inches)	96	96	96	
Measured Tank Diameter (Inches)	96	95	94	
Tank Deflection (Inches)	0	1	2	
Device Position and Ullage Calculation				
Type of Device: (Ball Float or Drop Tube)	☐ B.F ☐ D.T	☐ B.F ☐ D.T	☐ B.F ☐ D.T	☐ B.F ☐ D.T
Overfill Device is Installed at: Low End ("X" position)	☐	☐	■	☐
Overfill Device is Installed at: Center ("Y" position)	■	☐	☐	☐
Overfill Device is Installed at: High End ("Z" position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)				
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)				

Annual Overfill Prevention Device Inspection

Distance of device below tank top at low end of tank

- These sections ultimately is what determines pass / fail.
- You need results from pg. 1
- Then comes the math.
- Equation to use is based on where your device is located.

Device Position and Ullage Calculation					
Type of Device: (Ball Float or Drop Tube)		☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ☐ D.T
Overfill Device is Installed at	Low End ("X" position)	☐	☐	■	☐
	Center ("Y" position)	■	☐	☐	☐
	High End ("Z" position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					
Alternative Method Results (mark all that apply)					
Manifolded tank tops **OR** the overfill devices installed in them appear to be level with each other		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is "precision" type and initial restriction occurs 30 min before tank top fittings wetted.		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is "2 Stage" device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)					

Annual Overfill Prevention Device Inspection

Distance of device below tank top at low end of tank

- From pg. 1 we had 3 devices fail.
  - Regular @ 6”
  - Hwy Diesel @ 5”
  - Off Road Diesel @ 8”
- These numbers are used by equations.

Inspection Results for the Year		Regular	Premium	Hwy Diesel	Off Road Diesel
Tank ID (product stored)					
Tank Volume (gallons)					
Tank Diameter (inches)		96	96	96	96
Overfill device present		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Overfill Device Manufacturer		EBW	Emco	OPW	OPW
Overfill Device Model		Auto Limiter	A1100	61 SO	71 SO
Device is New		□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes □No	■Yes □No	■Yes □No	■Yes □No
Ball Float Valve	All accessible tank top fittings are tight	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Tank does NOT have a suction or tank syphon line installed	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Standard drop tubes are installed & in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Length of Ball Float Valve (inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Assembly and all gaskets/seals in good condition	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Length of upper tube to the “Reference Point” (inches)	36	44	36.5	39.5
	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30	30	30	30
	Height of tank top manway (if applicable) (inches)	0	4.5	0	0
	Distance below tank top where “Reference Point” is located (Inches)	6	9.5	6.5	9.5
	Distance between Reference Point and Complete Shut off Point	0	0	1.5	1.5
	Distance below tank top where complete shut off occurs (inches)	6	9.5	5	8
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%	95%	98%	96%
Electronic Alarm	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Inspection result (Pass/Fail)		Fail	PASS	Fail	Fail

Annual Overfill Prevention Device Inspection

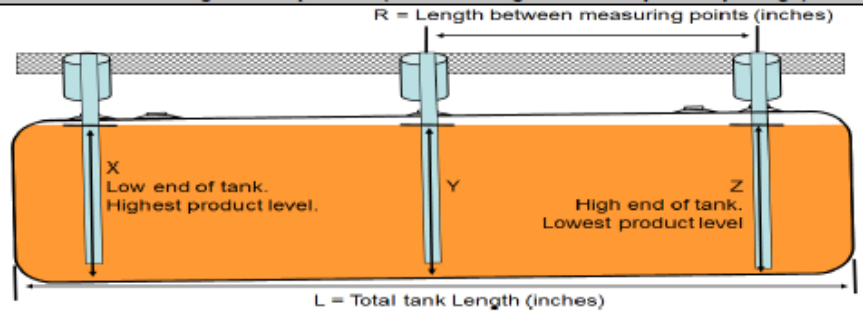
Device in Middle

- Regular tank DT in middle.
- DT is set at 6” below tank top. Pg. 1
- Use equation for:
  - “Ullage (inches) at low end when device is at middle”
- Ullage (inches) $= 6" - (\frac{1}{2} * 2") - 0" = 5”$

6” from pg. 1 — Half of tank tilt $\frac{2" \; tank \; tilt}{2}$ — Deflection

- Ullage (inches) = 5”
- DT is 5” below tank top at the low end of the tank.

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer	☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):		
Tank ID (product stored)	Regular	Hwy Diesel	Off Road Diesel	
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)	319	319	319	
Length between measuring points (R) (Inches)	159	159	279	
Product level measured at “X” (inches)	49"		49"	
Product level measured at “Y” (inches)	48"	49"		
Product level measured at “Z” (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)	2	2	1.14	

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)	96	96	96	
Measured Tank Diameter (Inches)	96	95	94	
Tank Deflection (Inches)	0	1	2	

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F. ■ D.T	☐ B.F. ■ D.T	☐ B.F. ■ D.T	☐ B.F. ☐ D.T
Overfill Device Installed at	Low End (“X” position)	☐	☐	■	☐
	Center (“Y” position)	■	☐	☐	☐
	High End (“Z” position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)		5"			
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Annual Overfill Prevention Device Inspection

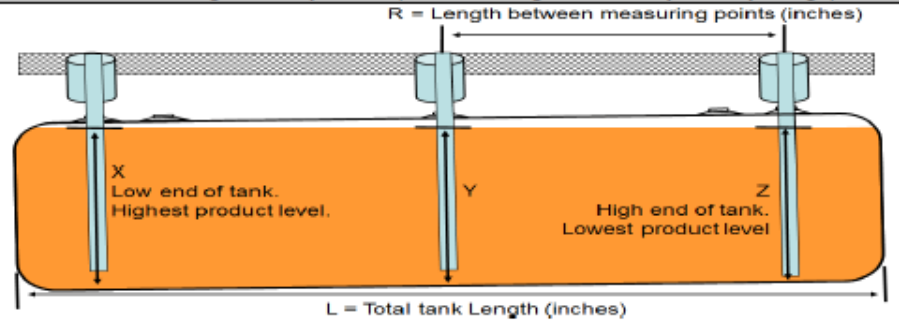
Device at High End

- Hwy Diesel tank DT installed at High end.
- DT is set at 5” below tank top. Pg. 1
- Use equation for:
  - “Ullage (inches) at low end when device is at high end”
- Ullage (inches) $= 5" - 2" - 1"$ = 2”

5” from pg. 1 tank tilt Deflection

- Ullage (inches) = 2”
- DT is 2” below tank top at the low end of the tank.

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer	☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):		
Tank ID (product stored)	Regular	Hwy Diesel	Off Road Diesel	
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)	319	319	319	
Length between measuring points (R) (Inches)	159	159	279	
Product level measured at "X" (inches)	49"		49"	
Product level measured at "Y" (inches)	48"	49"		
Product level measured at "Z" (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)	2	2	1.14	

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)	96	96	96	
Measured Tank Diameter (Inches)	96	95	94	
Tank Deflection (Inches)	0	1	2	

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ☐ D.T
Overfill Device is Ins	Low End ("X" position)	☐	☐	■	☐
	Center ("Y" position)	■	☐	☐	☐
	High End ("Z" position)	☐	■	☐	☐
Distance of Device b ow tank top at low end of tank (inches)		5"	2		
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Annual Overfill Prevention Device Inspection

Device at Low End

- Off Road Diesel tank DT installed at Low end.
- DT is set at 8” below tank top. Pg. 1
- Is tank tilt greater than deflection?

1.14” > 2” NO. You have to account for deflection

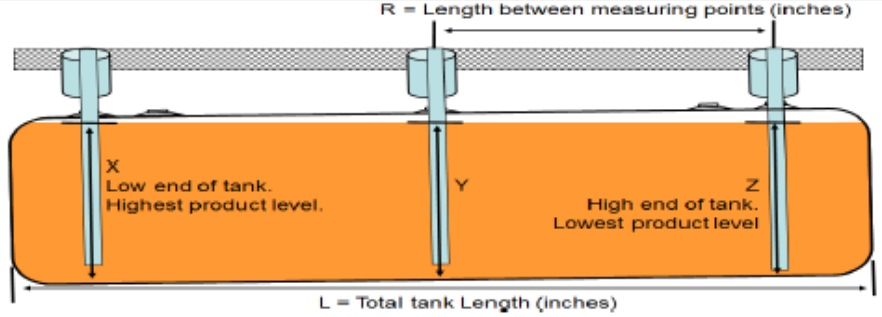
Take the difference. 2” – 1.14” = 0.86”

- Ullage (inches) = 8" – 0.86" = 7.14”

8” from pg. 1 the difference

- Ullage (inches) = 7.14”
- DT is 7.14” below tank top at the low end of the tank.
- Had Tilt been greater than deflection the Ullage (Inches) would simply be 8” (same as pg. 1)

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer	☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):

Tank ID (product stored)	Regular	Hwy Diesel	Off Road Diesel	
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)	319	319	319	
Length between measuring points (R) (Inches)	159	159	279	
Product level measured at "X" (inches)	49"		49"	
Product level measured at "Y" (inches)	48"	49"		
Product level measured at "Z" (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)	2	2	1.14	
Tank Deflection Determination				
Tank diameter as it appears on tank chart (inches)	96	96	96	
Measured Tank Diameter (Inches)	96	95	94	
Tank Deflection (Inches)	0	1	2	
Device Position and Ullage Calculation				
Type of Device: (Ball Float or Drop Tube)	☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ☐ D.T
Device is Installed at: Low End ("X" position)	☐	☐	■	☐
Device is Installed at: Center ("Y" position)	■	☐	☐	☐
Device is Installed at: High End ("Z" position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)	5"	2	7.14	
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)				

Annual Overfill Prevention Device Inspection

The Results pg. 2

- MDEQ requires minimum 1” ullage at low end.
- All 3 passed using alternative method.
- You should mark Pass on pg. 1

**Note some manufacturers have minimum ullage requirements.

- Franklin Defender – 250 gallons

Tank Tilt Determination				
Method of Determining Tank Tilt	☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer	☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):		
Tank ID (product stored)	Regular	Hwy Diesel	Off Road Diesel	
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)	319	319	319	
Length between measuring points (R) (Inches)	159	159	279	
Product level measured at “X” (inches)	49"		49"	
Product level measured at “Y” (inches)	48"	49"		
Product level measured at “Z” (inches)		48"	48"	
Difference between product levels (inches)	1	1	1	
Overall Tank Tilt (inches)	2	2	1.14	
Tank Deflection Determination				
Tank diameter as it appears on tank chart (inches)	96	96	96	
Measured Tank Diameter (Inches)	96	95	94	
Tank Deflection (Inches)	0	1	2	
Device Position and Ullage Calculation				
Type of Device: (Ball Float or Drop Tube)	☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ■ D.T	☐ B.F ☐ D.T
Overfill Device is Installed at: Low End (“X” position)	☐	☐	■	☐
Overfill Device is Installed at: Center (“Y” position)	■	☐	☐	☐
Overfill Device is Installed at: High End (“Z” position)	☐	■	☐	☐
Distance of Device below tank top at low end of tank (inches)	5"	2	7.14	
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)	198	50	337	
Alternative Method Results (mark all that apply)				
Manifolded tank tops OR the overfill devices installed in them appear to be level with each other	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is “precision” type and initial restriction occurs 30 min before tank top fittings wetted.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is “2 Stage” device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)	Pass	Pass	Pass	

Annual Overfill Prevention Device Inspection

The Results pg. 1

- On pg. 1 mark them as passing.
- What about cases where tank has a DT & a BF?

Inspection Results for the Year					
	Tank ID (product stored)	Regular	Premium	Hwy Diesel	Off Road Diesel
	Tank Volume (gallons)				
	Tank Diameter (inches)	96	96	96	96
	Overfill device present	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
	Overfill Device Manufacturer	EBW	Emco	OPW	OPW
	Overfill Device Model	Auto Limiter	A1100	61 SO	71 SO
	Device is New	☐ Yes ■ No	☐ Yes ■ No	☐ Yes ■ No	☐ Yes ■ No
	Device in good condition (Note Criteria in Inspection Procedure)	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Ball Float Valve	All accessible tank top fittings are tight	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Tank does NOT have a suction or tank syphon line installed	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Standard drop tubes are installed & in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Length of Ball Float Valve (inches)				
	Height of tank top manway (if applicable) (inches)				
	Distance below top of tank that ball float valve is set (inches)				
	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
	Assembly and all gaskets/seals in good condition	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
	Length of upper tube to the "Reference Point" (inches)	36	44	36.5	39.5
	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30	30	30	30
	Height of tank top manway (if applicable) (inches)	0	4.5	0	0
	Distance below tank top where "Reference Point" is located (Inches)	6	9.5	6.5	9.5
	Distance between Reference Point and Complete Shut off Point	0	0	1.5	1.5
	Distance below tank top where complete shut off occurs (inches)	6	9.5	5	8
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%	95%	98%	96%
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Inspection result (Pass/Fail)	Pass	PASS	Pass	Pass
Comments: Regular, Hwy Diesel, and Off Road Diesel pass using alternative method. pg. 2					

Annual Overfill Prevention Device Inspection

What if they have both BF and DT?

- Options:
  - Permanently Remove the BF
  - Measure BF and DT to pass or fail.
- Document measurements pg. 1 & 2.
- Does complete shut off occur below any ball float nipple in the tank?

- Consider the previous example

  Hwy & Off Road Diesel Tanks

Inspection Results for the Year					
	Tank ID (product stored)	Regular	Premium	Hwy Diesel	Off Road Diesel
	Tank Volume (gallons)				
	Tank Diameter (inches)	96	96	96	96
	Overfill device present	■Yes □No	■Yes □No	■Yes □No	■Yes □No
	Overfill Device Manufacturer	EBW	Emco	OPW	OPW
	Overfill Device Model	Auto Limiter	A1100	61 SO	71 SO
	Device is New	□Yes ■No	□Yes ■No	□Yes ■No	□Yes ■No
	Device in good condition (Note Criteria in Inspection Procedure)	■Yes □No	■Yes □No	■Yes □No	■Yes □No
Ball Float Valve	All accessible tank top fittings are tight	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Ball Float Valve	Standard drop tubes are installed & in good condition	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	■Yes □No	■Yes □No	■Yes □No	■Yes □No
Drop Tube Device	Assembly and all gaskets/seals in good condition	■Yes □No	■Yes □No	■Yes □No	■Yes □No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)	36	39.5	36.5	39.5
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30	30	30	30
Drop Tube Device	Height of tank top manway (if applicable) (inches)	0	0	0	0
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)	6	9.5	6.5	9.5
Drop Tube Device	Distance between Reference Point and Complete Shut off Point	0	0	1.5	1.5
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)	6	9.5	5	8
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%	95%	98%	96%
Electronic Alarm	Alarm is both audible and visible to delivery driver	□Yes □No	□Yes □No	□Yes □No	□Yes □No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	□Yes □No	□Yes □No	□Yes □No	□Yes □No
	Inspection result (Pass/Fail)	FAIL	PASS	FAIL	FAIL

Annual Overfill Prevention Device Inspection

Documenting both… BF & DT pg. 1

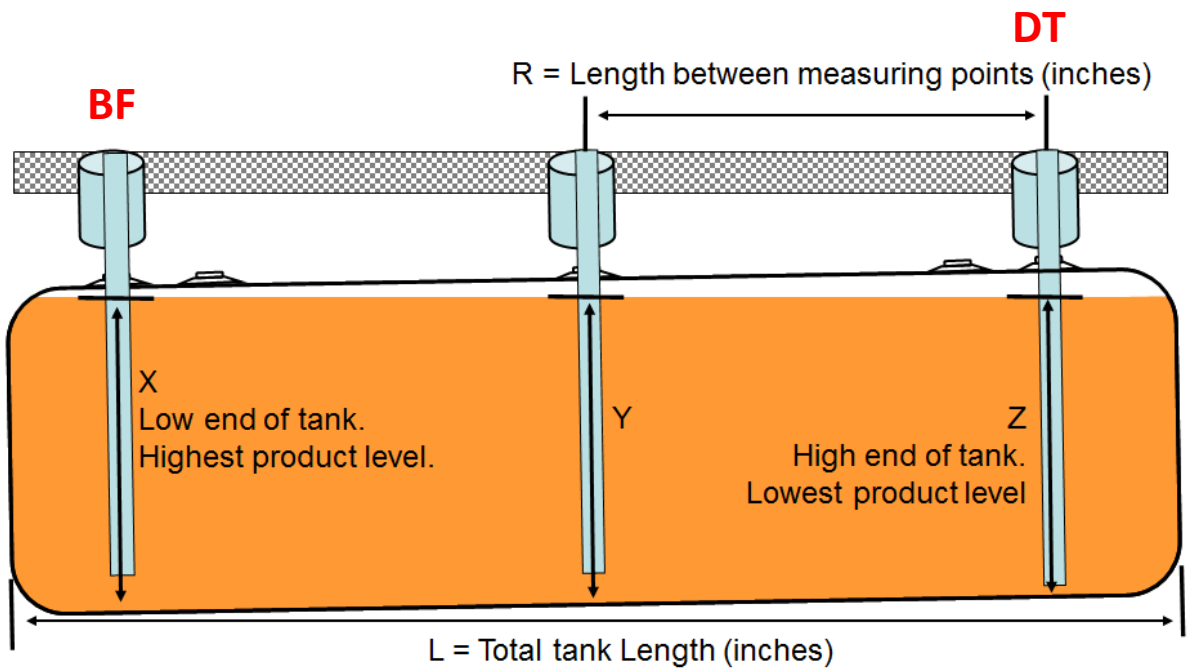
- You should document measurements for both on pg. 1
- As it sits:
  - All 4 devices (2 tanks) fail unless you use pg. 2
  - Whether BF is precision or not does not matter.
  - Drop tube is the primary device. It must pass.
- To pass it, you must confirm that: “Complete shut off occurs below any ball float nipple in the tank”
- I broke these down into 2 columns on pg. 1 but you can combine into 1 column.
- On pg. 2 you must break them down into 2 columns.

Inspection Results for the Year					
Tank ID (product stored)		Hwy Diesel	Hwy Diesel	Off Road Diesel	Off Road Diesel
Tank Volume (gallons)					
Tank Diameter (inches)		96	96	96	96
Overfill device present		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Overfill Device Manufacturer		OPW	OPW	OPW	Franklin Fueling
Overfill Device Model		61 SO	53 VML	71 SO	EBW 308
Device is New		☐Yes ■No	☐Yes ■No	☐Yes ■No	☐Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Length of Ball Float Valve (inches)		6		7
	Height of tank top manway (if applicable) (inches)		0		0
	Distance below top of tank that ball float valve is set (inches)		6		7
	Indicate tank capacity when flow restriction occurs (%)		97%		97%
	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Assembly and all gaskets/seals in good condition	■Yes ☐No	☐Yes ☐No	■Yes ☐No	☐Yes ☐No
Drop Tube Device	Length of upper tube to the “Reference Point” (inches)	36.5		39.5	
	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30		30	
	Height of tank top manway (if applicable) (inches)	0		0	
	Distance below tank top where “Reference Point” is located (Inches)	6.5		9.5	
	Distance between Reference Point and Complete Shut off Point	1.5		1.5	
	Distance below tank top where complete shut off occurs (inches)	5		8	
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%		96%	
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Inspection result (Pass/Fail)		Fail	Fail	Fail	Fail

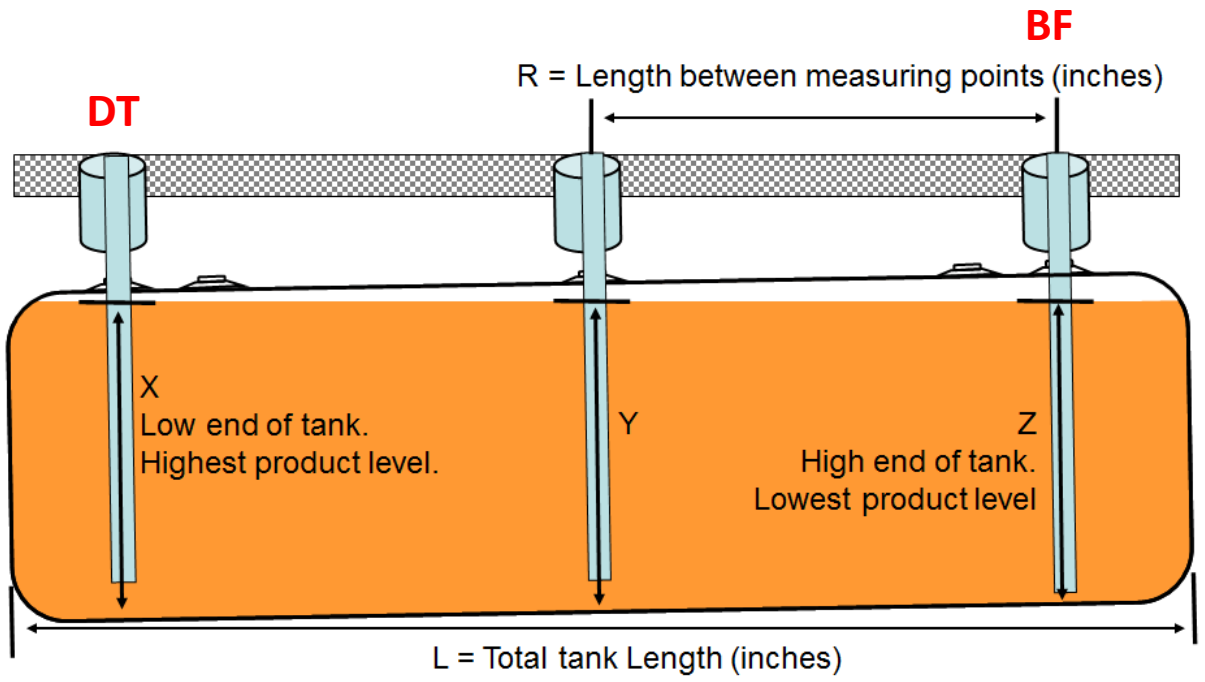
Annual Overfill Prevention Device Inspection

Layout of Example

Highway Diesel



Off Road Diesel



Annual Overfill Prevention Device Inspection

Documenting both… BF & DT pg. 2

- Use the same procedure & equations to figure up Tilt & Deflection for BFs.
- Tank Deflection should be the same.
- Tank tilt:
  - You don't have to measure tilt twice
- Figure out where the BF is located. This is what determines which equation to use.

  (see layout from previous slide.)
- Use equation to calculate "distance below tank top at low end of tank".

Tank Tilt Determination					
Method of Determining Tank Tilt	■ Product level gauged at two separate tank openings; ☐ Measured with a tank inclinometer		☐ Elevation of each end of tank surveyed with a level; ☐ Other (specify):		
Tank ID (product stored)		Hwy Diesel	Hwy Diesel	Off Road Diesel	Off Road Diesel
Tank capacity greater than 4,000 gallons?		■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Tank Tilt can be determined		■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Total Tank Length (inches)		319	319	319	319
Length between measuring points (R) (Inches)		159	279	279	36
Product level measured at "X" (inches)			49.75	49	48.13
Product level measured at "Y" (inches)		49			
Product level measured at "Z" (inches)		48	48	48	48
Difference between product levels (inches)		1	1.75	1	0.13
Overall Tank Tilt (inches)		2	2	1.14	1.15
Tank Deflection Determination					
Tank diameter as it appears on tank chart (inches)		96	96	96	96
Measured Tank Diameter (Inches)		95	95	94	94
Tank Deflection (Inches)		1	1	2	2
Device Position and Ullage Calculation					
Type of Device: (Ball Float or Drop Tube)		☐ B.F ■ D.T	■ B.F ☐ D.T	☐ B.F ■ D.T	■ B.F ☐ D.T
Overfill Device is Installed at	Low End ("X" position)	☐	■	■	☐
	Center ("Y" position)	☐	☐	☐	☐
	High End ("Z" position)	■	☐	☐	■
Distance of Device below tank top at low end of tank (inches)		2		7.14	
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)		50		337	

Annual Overfill Prevention Device Inspection

Documenting both… BF & DT pg. 2

- From pg. 1 we had BF's measured at:
  - Hwy Diesel @ 6"
  - Off Road Diesel @ 7"

- These numbers are used by equations.

Inspection Results for the Year					
Tank ID (product stored)		Hwy Diesel	Hwy Diesel	Off Road Diesel	Off Road Diesel
Tank Volume (gallons)					
Tank Diameter (inches)		96	96	96	96
Overfill device present		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Overfill Device Manufacturer		OPW	OPW	OPW	Franklin Fueling
Overfill Device Model		61 SO	53 VML	71 SO	EBW 308
Device is New		☐Yes ■No	☐Yes ■No	☐Yes ■No	☐Yes ■No
Device in good condition (Note Criteria in Inspection Procedure)		■Yes ☐No	■Yes ☐No	■Yes ☐No	■Yes ☐No
Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Length of Ball Float Valve (inches)		6		7
	Height of tank top manway (if applicable) (inches)		0		0
	Distance below top of tank that ball float valve is set (inches)		6		7
	Indicate tank capacity when flow restriction occurs (%)		97%		97%
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Assembly and all gaskets/seals in good condition	■Yes ☐No	☐Yes ☐No	■Yes ☐No	☐Yes ☐No
	Length of upper tube to the "Reference Point" (inches)	36.5		39.5	
	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30		30	
	Height of tank top manway (if applicable) (inches)	0		0	
	Distance below tank top where "Reference Point" is located (Inches)	6.5		9.5	
	Distance between Reference Point and Complete Shut off Point	1.5		1.5	
	Distance below tank top where complete shut off occurs (inches)	5		8	
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%		96%	
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Inspection result (Pass/Fail)		Fail	Fail	Fail	Fail

Annual Overfill Prevention Device Inspection

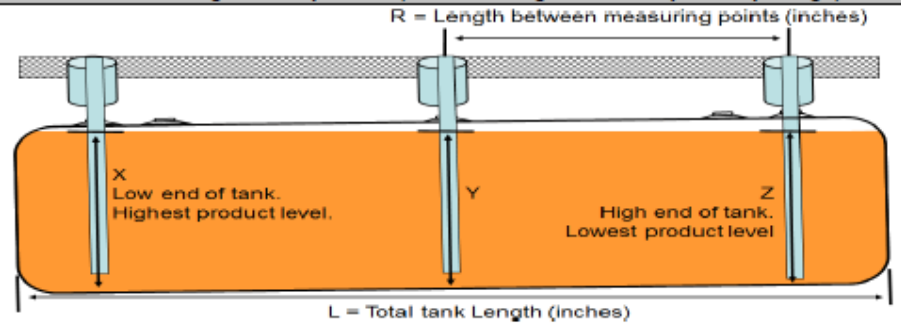
Device at Low End

- Hwy Diesel tank BF installed at Low end.
- BF is set at 6” below tank top. Pg. 1
- Is tank tilt greater than deflection?

  2” > 1” Yes. So, You don’t have to account for deflection

- Ullage (inches) = 6”
- BF is 6” below tank top at the low end of the tank.
- Had Tilt been less than deflection you would have had to take the difference and subtracted it out like shown in previous DT calculation.

Reference Diagram & Equations (Product Gauged at two separate openings)



Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt	■ Product level gauged at two separate tank openings; ☐ Measured with a tank inclinometer; ☐ Elevation of each end of tank surveyed with a level; ☐ Other (specify):			
Tank ID (product stored)	Hwy Diesel	Hwy Diesel	Off Road Diesel	Off Road Diesel
Tank capacity greater than 4,000 gallons?	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Tank Tilt can be determined	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Total Tank Length (inches)	319	319	319	319
Length between measuring points (R) (Inches)	159	279	279	36
Product level measured at "X" (inches)		49.75	49	48.13
Product level measured at "Y" (inches)	49			
Product level measured at "Z" (inches)	48	48	48	48
Difference between product levels (inches)	1	1.75	1	0.13
Overall Tank Tilt (inches)	2	2	1.14	1.15
Tank Deflection Determination				
Tank diameter as it appears on tank chart (inches)	96	96	96	96
Measured Tank Diameter (Inches)	95	95	94	94
Tank Deflection (Inches)	1	1	2	2
Device Position and Ullage Calculation				
Type of Device: (Ball Float or Drop Tube)	☐ B.F ■ D.T	■ B.F ☐ D.T	☐ B.F ■ D.T	■ B.F ☐ D.T
Device is Installed at: Low End ("X" position)	☐	■	■	☐
Device is Installed at: Center ("Y" position)	☐	☐	☐	☐
Device is Installed at: High End ("Z" position)	■	☐	☐	■
Distance of Device below tank top at low end of tank (inches)	2	6	7.14	
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)	50		337	

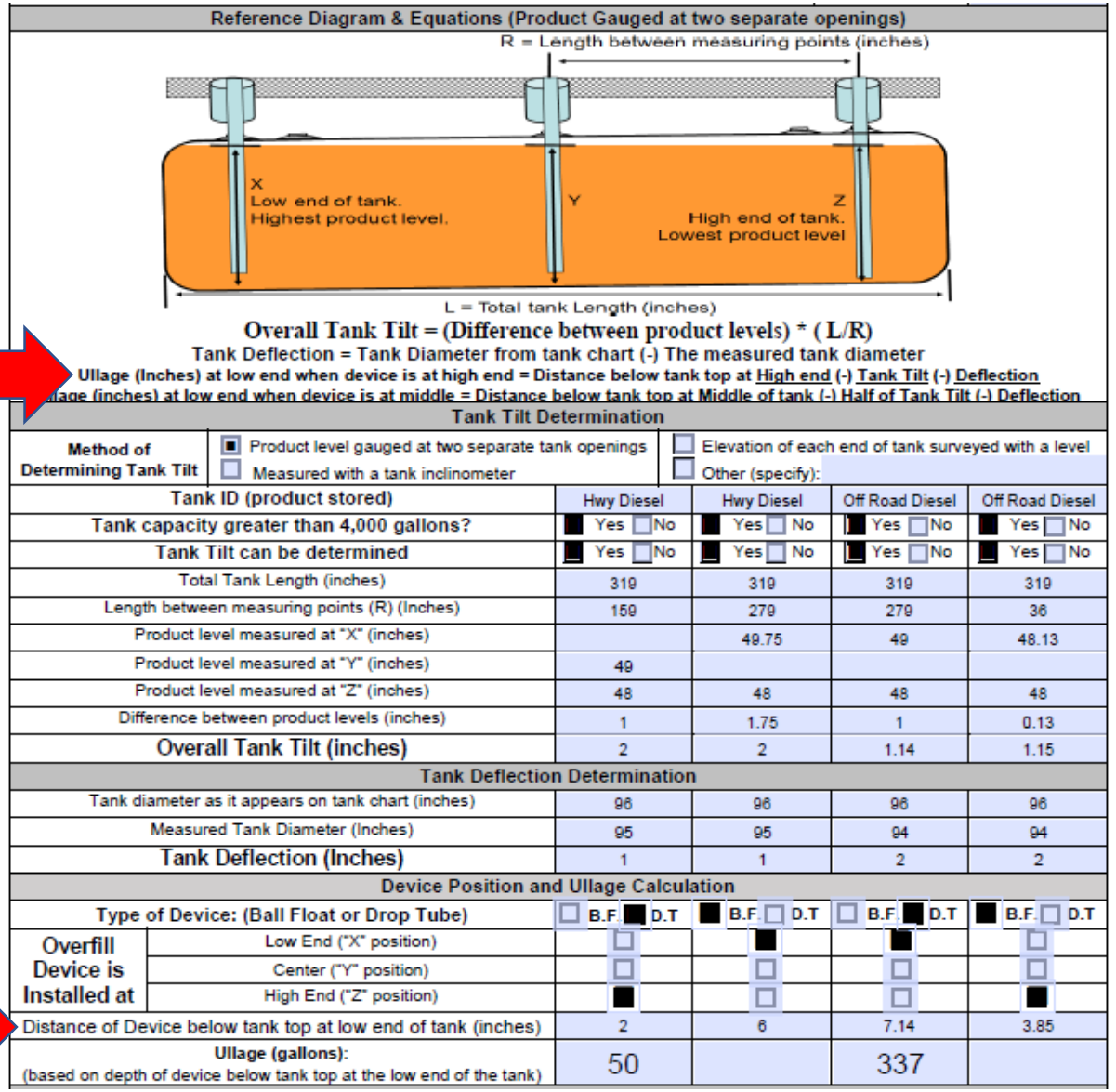
Annual Overfill Prevention Device Inspection

Device at High End

- Off Road Diesel tank BF installed at High end.
- BF is set at 7” below tank top. Pg. 1
- Use equation for:
  - “Ullage (inches) at low end when device is at high end”
- Ullage (inches) $= 7" - 1.15" - 2"$ = 3.85”

7” from pg. 1 tank tilt Deflection

- Ullage (inches) = 3.85”
- BF is 3.85” below tank top at the low end of the tank.



Reference Diagram & Equations (Product Gauged at two separate openings)

Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt			
■ Product level gauged at two separate tank openings	☐ Elevation of each end of tank surveyed with a level		
☐ Measured with a tank inclinometer	☐ Other (specify):		

Tank ID (product stored)	Hwy Diesel	Hwy Diesel	Off Road Diesel	Off Road Diesel
Tank capacity greater than 4,000 gallons?	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Tank Tilt can be determined	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Total Tank Length (inches)	319	319	319	319
Length between measuring points (R) (Inches)	159	279	279	36
Product level measured at “X” (inches)		49.75	49	48.13
Product level measured at “Y” (inches)	49			
Product level measured at “Z” (inches)	48	48	48	48
Difference between product levels (inches)	1	1.75	1	0.13
Overall Tank Tilt (inches)	2	2	1.14	1.15

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)	96	96	96	96
Measured Tank Diameter (Inches)	95	95	94	94
Tank Deflection (Inches)	1	1	2	2

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F ■ D.T	■ B.F ☐ D.T	☐ B.F ■ D.T	■ B.F ☐ D.T
Overfill Device is Installed at	Low End (“X” position)	☐	■	■	☐
	Center (“Y” position)	☐	☐	☐	☐
	High End (“Z” position)	■	☐	☐	■
Distance of Device below tank top at low end of tank (inches)		2	6	7.14	3.85
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)		50		337	

Annual Overfill Prevention Device Inspection

BF & DT Example… The Results pg. 2

- Hwy Diesel DT device Fails.
  - BF is set lower.
- Off Road Diesel DT device Passes.
  - BF is set higher.
- Comparison is made using “Distance of device below tank top at the low end of the tank.”
- The ullage for the BF, isn’t important since your only comparing inches.

Tank Tilt Determination					
Method of Determining Tank Tilt	■ Product level gauged at two separate tank openings; ☐ Measured with a tank inclinometer; ☐ Elevation of each end of tank surveyed with a level; ☐ Other (specify):				
Tank ID (product stored)		Hwy Diesel	Hwy Diesel	Off Road Diesel	Off Road Diesel
Tank capacity greater than 4,000 gallons?		■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Tank Tilt can be determined		■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Total Tank Length (inches)		319	319	319	319
Length between measuring points (R) (Inches)		159	279	279	36
Product level measured at "X" (inches)			49.75	49	48.13
Product level measured at "Y" (inches)		49			
Product level measured at "Z" (inches)		48	48	48	48
Difference between product levels (inches)		1	1.75	1	0.13
Overall Tank Tilt (inches)		2	2	1.14	1.15
Tank Deflection Determination					
Tank diameter as it appears on tank chart (inches)		96	96	96	96
Measured Tank Diameter (Inches)		95	95	94	94
Tank Deflection (Inches)		1	1	2	2
Device Position and Ullage Calculation					
Type of Device: (Ball Float or Drop Tube)		☐ B.F. ■ D.T	■ B.F. ☐ D.T	☐ B.F. ■ D.T	■ B.F. ☐ D.T
Overfill Device is Installed at	Low End ("X" position)	☐	■	■	☐
	Center ("Y" position)	☐	☐	☐	☐
	High End ("Z" position)	■	☐	☐	■
Distance of Device below tank top at low end of tank (inches)		2	6	7.14	3.85
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)		50	260	337	135
Alternative Method Results (mark all that apply)					
Manifolded tank tops OR the overfill devices installed in them appear to be level with each other		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ■ No	☐ Yes ☐ No
Ball float is "precision" type and initial restriction occurs 30 min before tank top fittings wetted.		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ■ No	☐ Yes ☐ No
Drop tube device is "2 Stage" device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)		☐ Yes ☐ No	☐ Yes ■ No	☐ Yes ☐ No	☐ Yes ■ No
Inspection for Alternative Method (Pass / Fail)		FAIL	FAIL	PASS	PASS

Annual Overfill Prevention Device Inspection

BF & DT Example… The Results pg. 1

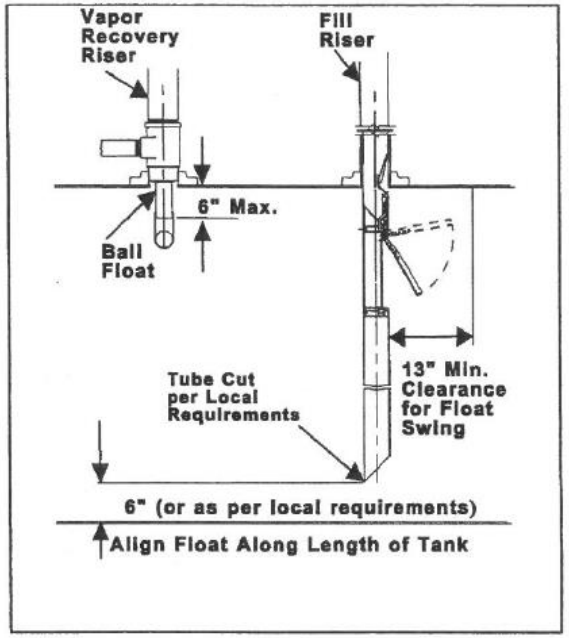
- On pg. 1 now you are ready to answer the question.
- Does “Complete shut off occur below any ball float nipple in the tank”?
  - Hwy Diesel tank BF --- NO
  - Off Road Diesel tank BF --- YES
- DT is primary device. Since it does not pass, both BF & DT in the Hwy Diesel Tank Fail.

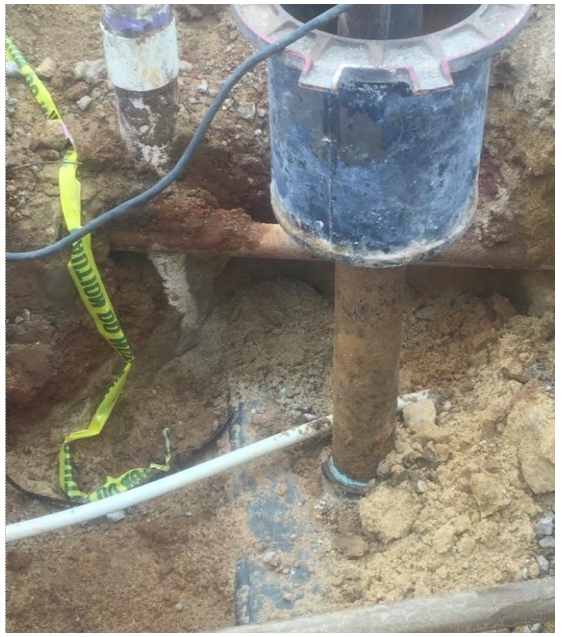
Inspection Results for the Year					
Tank ID (product stored)		Hwy Diesel	Hwy Diesel	Off Road Diesel	Off Road Diesel
Tank Volume (gallons)					
Tank Diameter (inches)		96	96	96	96
Overfill device present		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Overfill Device Manufacturer		OPW	OPW	OPW	Franklin Fueling
Overfill Device Model		61 SO	53 VML	71 SO	EBW 308
Device is New		☐ Yes ■ No	☐ Yes ■ No	☐ Yes ■ No	☐ Yes ■ No
Device in good condition (Note Criteria in Inspection Procedure)		■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No	■ Yes ☐ No
Ball Float Valve	All accessible tank top fittings are tight	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Tank does NOT have a suction or tank syphon line installed	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Standard drop tubes are installed & in good condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Length of Ball Float Valve (inches)		6		7
	Height of tank top manway (if applicable) (inches)		0		0
	Distance below top of tank that ball float valve is set (inches)		6		7
	Indicate tank capacity when flow restriction occurs (%)		97%		97%
	Complete shut off occurs below any ball float nipple in the tank	☐ Yes ■ No	☐ Yes ■ No	■ Yes ☐ No	■ Yes ☐ No
	Assembly and all gaskets/seals in good condition	■ Yes ☐ No	☐ Yes ☐ No	■ Yes ☐ No	☐ Yes ☐ No
Drop Tube Device	Length of upper tube to the “Reference Point” (inches)	36.5		39.5	
	Length of Fill Riser pipe (Seating position to tank top) (Inches)	30		30	
	Height of tank top manway (if applicable) (inches)	0		0	
	Distance below tank top where “Reference Point” is located (Inches)	6.5		9.5	
	Distance between Reference Point and Complete Shut off Point	1.5		1.5	
	Distance below tank top where complete shut off occurs (inches)	5		8	
	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)	98%		96%	
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Distance below top of tank that electronic alarm is set (inches)				
	Indicate tank capacity when alarm occurs (%)				
	ATG Printout attached	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection result (Pass/Fail)		Fail	Fail	Pass	Pass
Comments: Off Road diesel drop tube device passes using alternative method. pg. 2					

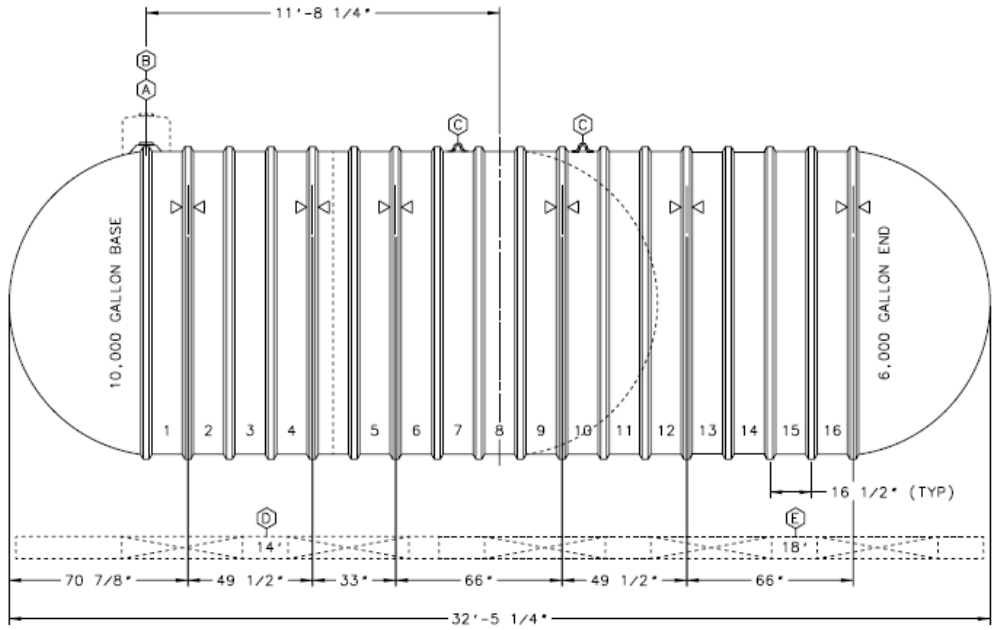
Annual Overfill Prevention Device Inspection

Reinstallation of DT devices… (Specifically OPW flapper type)

- Orientation in the tank matters.
- Flapper needs 13 – 14” to swing.
- Flapper MUST face away from anything that may bind it.
  - ATG probe
  - Tank Interstice pipe
  - End of tank or compartment
    - Don’t forget bubble of FRP “base compartment”
  - BF nipple
- Can the flapper move?
  - During routine deliveries?







Annual Overfill Prevention Device Inspection

Tight fill adapters. OF DT movement

- Your normal tight fill adapter will loosen through out the year.
- Delivery hose twists tight fill when it’s walked back after deliveries
- Consequences:
  - Upper tube no longer tight.
  - Gas will leak into spill buckets during delivery. (VERY Common)
  - Can allow DT to spin / move in riser.
- The fix:
  - Swivel type tight fill adapters.
  - Tight fill adapters with set screws.
  - Routine Inspection.

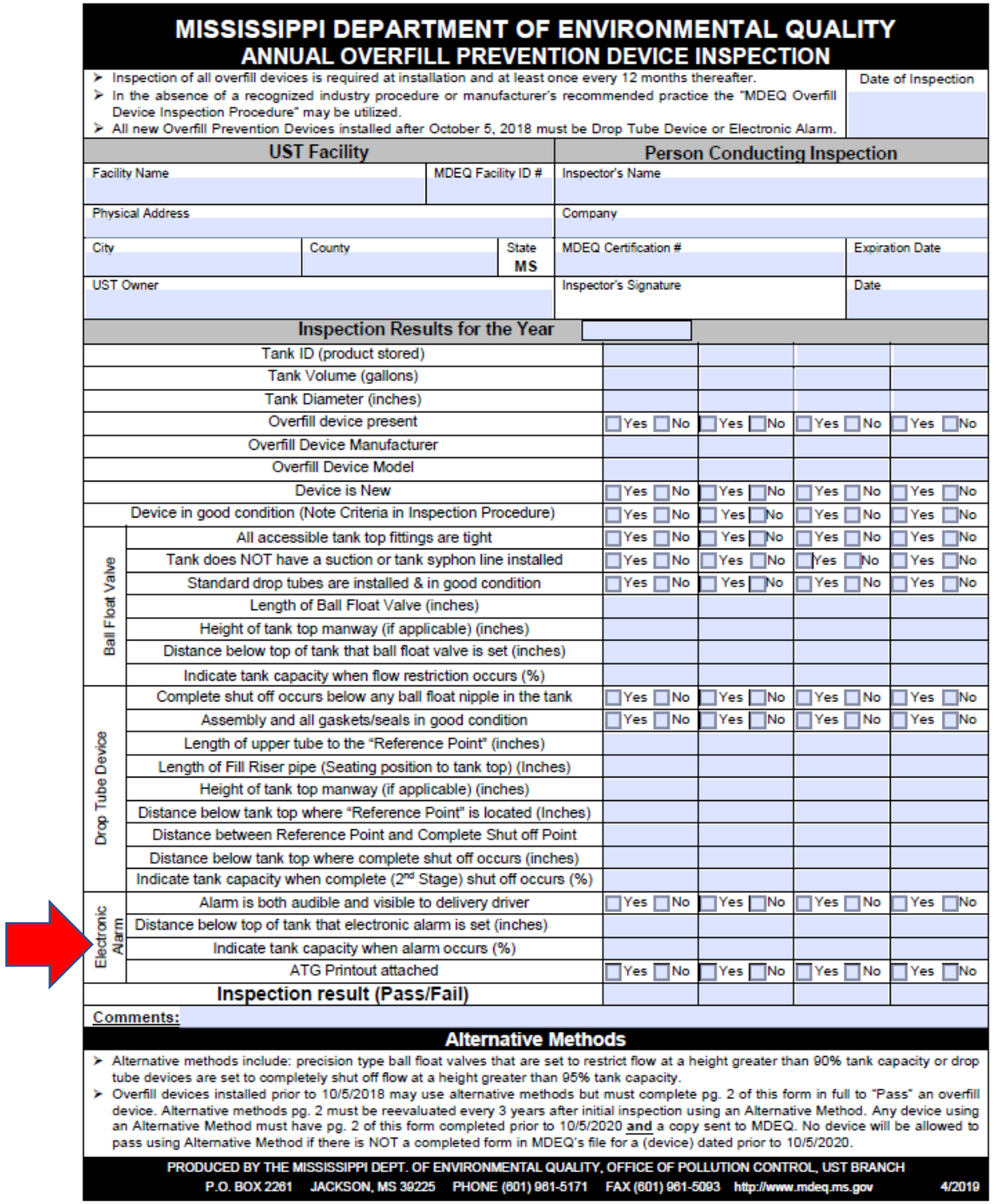
**Note: These are simply recommendations.

Not requirement by MDEQ.

Annual Overfill Prevention Device Inspection

Electronic Alarm pg. 1

- Must be set to Alarm at 90% capacity
  - Remember: FRP tanks you have to use manufacturer's tank chart.
- You should confirm ATG is programmed properly (# points, capacity)
- You MUST:
  - pull the ATG probe.
  - Raise the float until audible & visual alarm activates
  - Measure from bottom of probe to bottom of fuel float (when alarm activates)
  - Is this measurement at 90% tank capacity?



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL OVERFILL PREVENTION DEVICE INSPECTION

- Inspection of all overfill devices is required at installation and at least once every 12 months thereafter.
- In the absence of a recognized industry procedure or manufacturer's recommended practice the "MDEQ Overfill Device Inspection Procedure" may be utilized.
- All new Overfill Prevention Devices installed after October 5, 2018 must be Drop Tube Device or Electronic Alarm.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Inspection Results for the Year ____

	Tank ID (product stored)				
	Tank Volume (gallons)				
	Tank Diameter (inches)				
	Overfill device present	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Overfill Device Manufacturer				
	Overfill Device Model				
	Device is New	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Device in good condition (Note Criteria in Inspection Procedure)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	All accessible tank top fittings are tight	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Tank does NOT have a suction or tank syphon line installed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Standard drop tubes are installed & in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Ball Float Valve	Length of Ball Float Valve (inches)				
Ball Float Valve	Height of tank top manway (if applicable) (inches)				
Ball Float Valve	Distance below top of tank that ball float valve is set (inches)				
Ball Float Valve	Indicate tank capacity when flow restriction occurs (%)				
Drop Tube Device	Complete shut off occurs below any ball float nipple in the tank	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Assembly and all gaskets/seals in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Drop Tube Device	Length of upper tube to the "Reference Point" (inches)				
Drop Tube Device	Length of Fill Riser pipe (Seating position to tank top) (Inches)				
Drop Tube Device	Height of tank top manway (if applicable) (inches)				
Drop Tube Device	Distance below tank top where "Reference Point" is located (Inches)				
Drop Tube Device	Distance between Reference Point and Complete Shut off Point				
Drop Tube Device	Distance below tank top where complete shut off occurs (inches)				
Drop Tube Device	Indicate tank capacity when complete (2nd Stage) shut off occurs (%)				
Electronic Alarm	Alarm is both audible and visible to delivery driver	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Electronic Alarm	Distance below top of tank that electronic alarm is set (inches)				
Electronic Alarm	Indicate tank capacity when alarm occurs (%)				
Electronic Alarm	ATG Printout attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
	Inspection result (Pass/Fail)				

Comments:

Alternative Methods

- Alternative methods include: precision type ball float valves that are set to restrict flow at a height greater than 90% tank capacity or drop tube devices are set to completely shut off flow at a height greater than 95% tank capacity.
- Overfill devices installed prior to 10/5/2018 may use alternative methods but must complete pg. 2 of this form in full to "Pass" an overfill device. Alternative methods pg. 2 must be reevaluated every 3 years after initial inspection using an Alternative Method. Any device using an Alternative Method must have pg. 2 of this form completed prior to 10/5/2020 **and** a copy sent to MDEQ. No device will be allowed to pass using Alternative Method if there is NOT a completed form in MDEQ's file for a (device) dated prior to 10/5/2020.

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual Overfill Prevention Device Inspection

Electronic Alarm pg. 1

- You should at a minimum keep:
  - ATG in-tank setup print out
  - Overfill Alarm reports generated during test.
- That is your proof you did a good test

- MDEQ prohibits use of “Alternative Method” for Electronic OF alarms.
  - You can’t use pg. 2 to pass them.
  - Just reprogram the ATG.

```
IN-TANK SETUP
- - - - - - - - - - - -

T 1:REGULAR ULD
PRODUCT CODE      :      1
THERMAL COEFF     :.000070
TANK DIAMETER     :  96.00
TANK PROFILE      :   1 PT
        FULL VOL  :  12032

FLOAT SIZE:   4.0 INCHES

WATER WARNING     :    5.0
HIGH WATER LIMIT:      5.0

MAX OR LABEL VOL:  12032
OVERFILL LIMIT    :   96%
                  :  11550
HIGH PRODUCT      :   95%
                  :  11430
DELIVERY LIMIT    :   10%
                  :   1203

LOW PRODUCT       :   1500
LEAK ALARM LIMIT:     99
SUDDEN LOSS LIMIT:150000
TANK TILT         :   0.00

MANIFOLDED TANKS
T#: NONE

LEAK MIN ANNUAL : 10828

PERIODIC TEST TYPE
                    QUICK

ANNUAL TEST FAIL
          ALARM DISABLED

PERIODIC TEST FAIL
          ALARM DISABLED

GROSS TEST FAIL
          ALARM DISABLED

ANN TEST AVERAGING:  OFF
PER TEST AVERAGING:  OFF

TANK TEST NOTIFY:    OFF

TNK TST SIPHON BREAK:OFF

DELIVERY DELAY  :  2 MIN
```

```
ALARM HISTORY REPORT

---- IN-TANK ALARM ----

T 1:REGULAR 20K

HIGH WATER ALARM
APR  2, 2012 11:03 AM
NOV 22, 2011 11:39 AM
APR 20, 2010  5:29 AM

OVERFILL ALARM
JUN 25, 2014 12:07 PM
APR 21, 2014 10:48 PM
NOV 10, 2013  4:38 PM

LOW PRODUCT ALARM
JUN  1, 2014  9:01 PM
FEB  9, 2014  9:47 PM
FEB  8, 2014  6:34 PM

HIGH PRODUCT ALARM
JUN  5, 2012  9:38 AM
APR  2, 2012 10:52 AM
NOV 22, 2011 11:30 AM

INVALID FUEL LEVEL
JUN  1, 2014 11:04 PM
FEB  8, 2014  7:02 PM
NOV 27, 2013  5:12 PM

PROBE OUT
APR  2, 2012 11:53 AM
APR  2, 2012 10:50 AM
NOV 22, 2011 12:47 PM

HIGH WATER WARNING
APR  2, 2012 11:03 AM
NOV 22, 2011 11:39 AM
APR 20, 2010  5:29 AM

DELIVERY NEEDED
AUG 30, 2014  4:32 PM
AUG 29, 2014  7:12 PM
AUG  5, 2014  6:02 PM

MAX PRODUCT ALARM
APR  2, 2012 10:53 AM
NOV 22, 2011 11:30 AM
APR 20, 2010  5:20 AM

LOW TEMP WARNING
NOV 22, 2011 12:48 PM
APR 20, 2010  5:48 AM
APR  7, 2009  5:05 AM
```

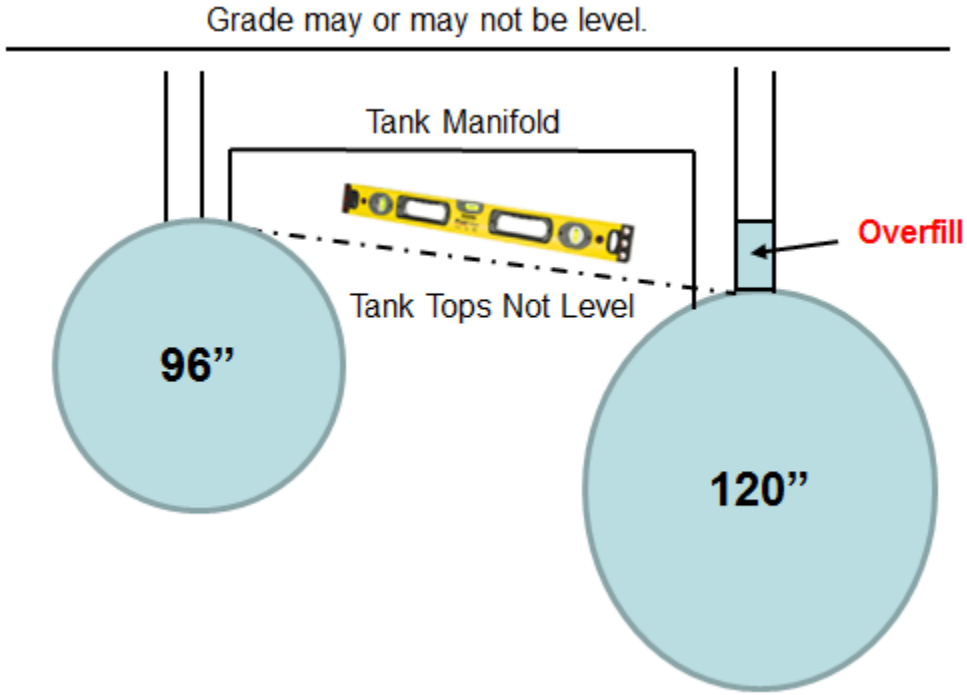
Should correspond to annual Testing date

```
---- IN-TANK ALARM ------
T 2:PREMIUM
OVERFILL ALARM
APR  3, 2019  3:14 PM
```

Annual Overfill Prevention Device Inspection

Manifold / Syphon tanks….

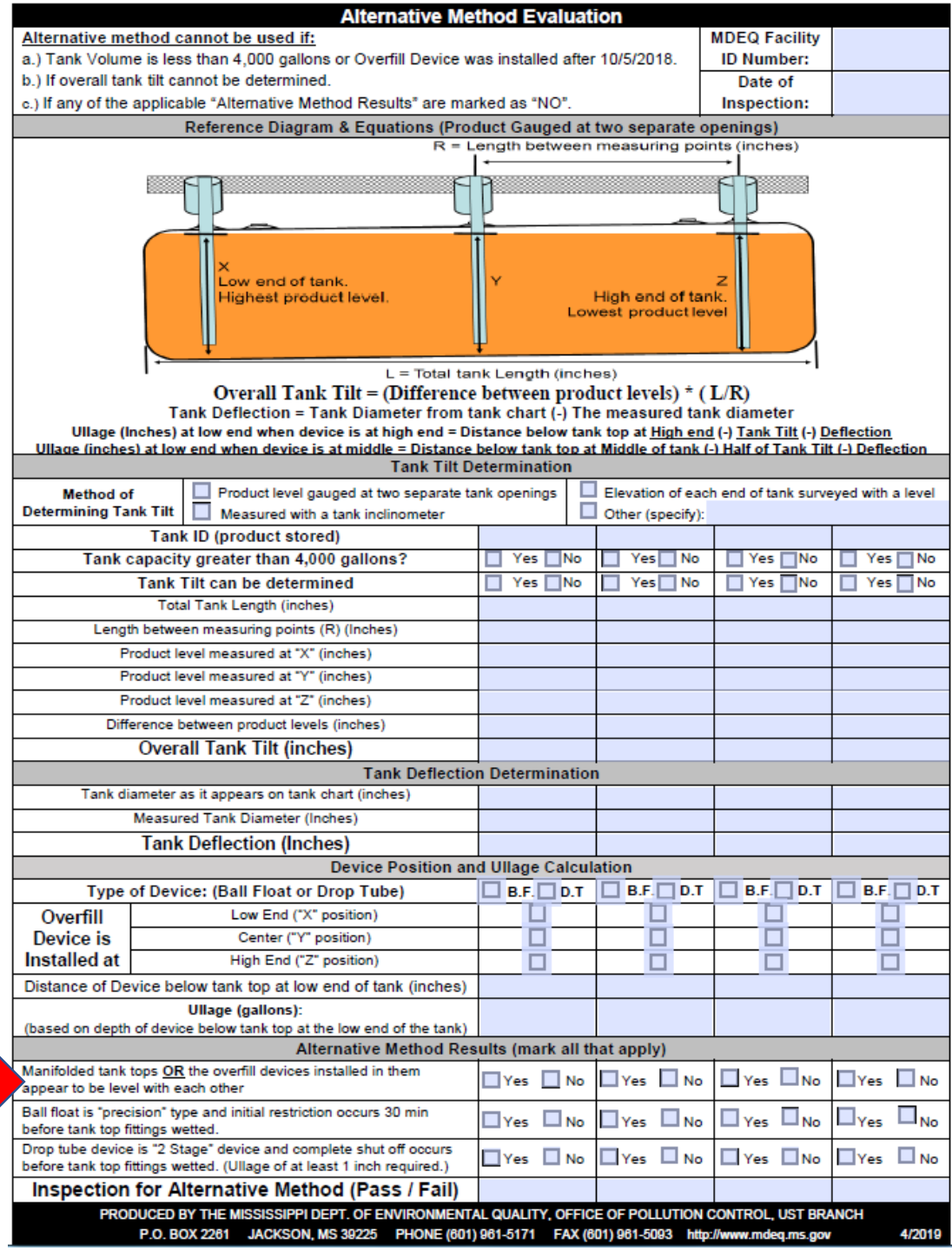
- Manifold lines, if not accounted for with OF devices will cause an overfill.
- Proceed with caution if you have manifold lines.
  - Measure tank diameters.
  - Do your best to determine burial depth.
  - Do tank tops <u>appear</u> level? <u>Or</u>
  - Are the devices installed in them level?



Annual Overfill Prevention Device Inspection

Manifold / Syphon tanks….

- Manifolded tank tops or the OF devices installed in them appear to be level with each other???
- Doesn’t apply to BFs.(Syphon lines can’t use BF)
- Required for “Alternative Method” pg. 2 if used to pass DT
- MDEQ doesn’t require documentation of your measurements to prove this.
- Is it important for DTs set at 95% on pg. 1?
  - Yes, it can be.



Alternative Method Evaluation

Alternative method cannot be used if:
a.) Tank Volume is less than 4,000 gallons or Overfill Device was installed after 10/5/2018.
b.) If overall tank tilt cannot be determined.
c.) If any of the applicable “Alternative Method Results” are marked as “NO”.

MDEQ Facility ID Number:
Date of Inspection:

Reference Diagram & Equations (Product Gauged at two separate openings)

R = Length between measuring points (inches)

X Low end of tank. Highest product level. Y Z High end of tank. Lowest product level

L = Total tank Length (inches)

Overall Tank Tilt = (Difference between product levels) * (L/R)

Tank Deflection = Tank Diameter from tank chart (-) The measured tank diameter

Ullage (Inches) at low end when device is at high end = Distance below tank top at High end (-) Tank Tilt (-) Deflection

Ullage (inches) at low end when device is at middle = Distance below tank top at Middle of tank (-) Half of Tank Tilt (-) Deflection

Tank Tilt Determination

Method of Determining Tank Tilt: ☐ Product level gauged at two separate tank openings ☐ Measured with a tank inclinometer ☐ Elevation of each end of tank surveyed with a level ☐ Other (specify):

Tank ID (product stored)				
Tank capacity greater than 4,000 gallons?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank Tilt can be determined	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Tank Length (inches)				
Length between measuring points (R) (Inches)				
Product level measured at “X” (inches)				
Product level measured at “Y” (inches)				
Product level measured at “Z” (inches)				
Difference between product levels (inches)				
Overall Tank Tilt (inches)				

Tank Deflection Determination

Tank diameter as it appears on tank chart (inches)				
Measured Tank Diameter (Inches)				
Tank Deflection (Inches)				

Device Position and Ullage Calculation

Type of Device: (Ball Float or Drop Tube)		☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T	☐ B.F. ☐ D.T
Overfill Device is Installed at	Low End (“X” position)	☐	☐	☐	☐
	Center (“Y” position)	☐	☐	☐	☐
	High End (“Z” position)	☐	☐	☐	☐
Distance of Device below tank top at low end of tank (inches)					
Ullage (gallons): (based on depth of device below tank top at the low end of the tank)					

Alternative Method Results (mark all that apply)

Manifolded tank tops OR the overfill devices installed in them appear to be level with each other	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Ball float is “precision” type and initial restriction occurs 30 min before tank top fittings wetted.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Drop tube device is “2 Stage” device and complete shut off occurs before tank top fittings wetted. (Ullage of at least 1 inch required.)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inspection for Alternative Method (Pass / Fail)				

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
P.O. BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http://www.mdeq.ms.gov 4/2019

Annual SV Testing

- Fuel more acidic = expect more frequent failures
- Easy to pass over and say its okay.
- Don’t do it. Test properly.
- Would you want to be next to this when it happens?

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL SHEAR VALVE TESTING

- This form may be utilized to document testing of shear valves (a.k.a. impact, crash, safety or fire valves).
- Testing of all shear valves is required at least once every 12 months.
- In the absence of an approved 3rd party test procedure or manufacturer's recommended practice, the procedure outlined below in the "MDEQ Shear Valve Test Procedure" section may be utilized.

Date of Test

UST Facility			Person Conducting Test	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State: MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	

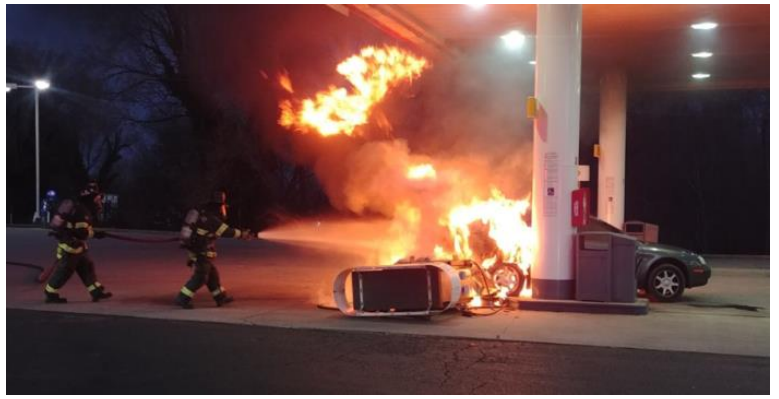
MDEQ Shear Valve Test Procedure

1. Visually inspect the shear valve for proper installation and anchoring. The portion of the shear valve located below the shear section must be rigidly anchored to the dispenser box frame or the concrete dispenser island.
2. Manually trip the shear valve lever arm. The lever arm must move freely into the tripped position without the use of force to do so. Lever arm must quickly snap shut the poppet valve.
3. Energize the pump and attempt to dispense fuel from the corresponding nozzle into a suitable container.
4. The shear valve must effectively interrupt the flow of fuel so that no fuel is dispensed from the nozzle.
5. Return the nozzle to the hanging position. Return the lever arm to its proper open position.

Test Data

Shear Valve ID	Dispenser # / Product										
Anchored Properly?		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Lever arm moves freely?		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Lever arm quickly snaps shut the poppet valve?		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Can product be dispensed when valve is closed?		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Pass or Fail		P/F	P/F	P/F	P/F	P/F	P/F	P/F	P/F	P/F	P/F

Electrical Issues

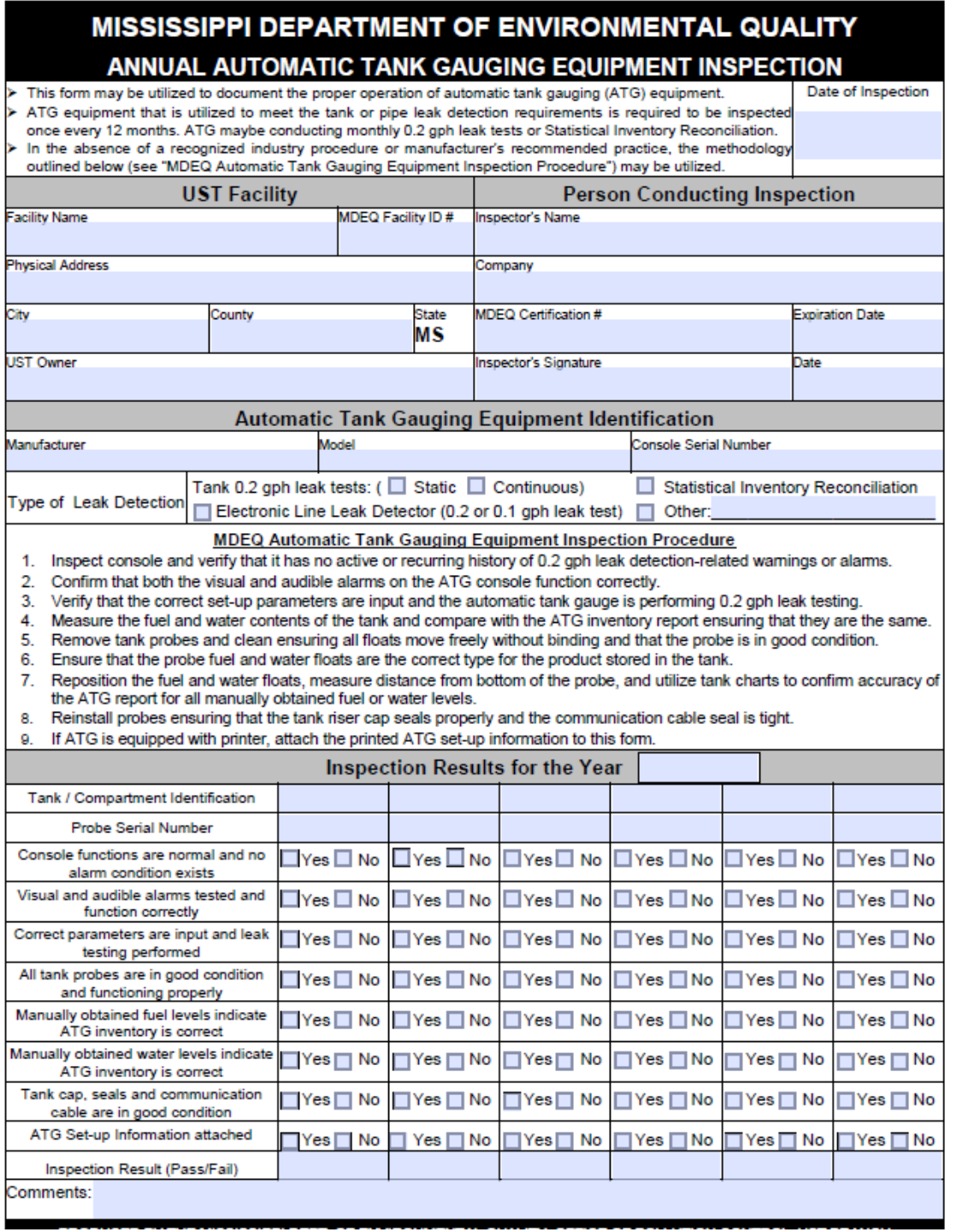


- Just because the Fire Marshall doesn't see it doesn't mean it's not an issue.
- DEQ inspectors see it
  - We can and may report it to Fire Marshalls.
- You wouldn't need a vehicle to ignite these. Would your SV work?

ATG Annual Inspections

- Do you have to do the inspection?
- Yes, if:
  - Using it for tank leak detection
    - 0.2 gph leak test. (Static / CSLDs)
    - SIR vendor who pulls data from ATG
  - Electronic LLDs (0.2 or 0.1 gph leak tests)
  - Client asks you to do it.

**Otherwise it is not necessary.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC TANK GAUGING EQUIPMENT INSPECTION

- This form may be utilized to document the proper operation of automatic tank gauging (ATG) equipment.
- ATG equipment that is utilized to meet the tank or pipe leak detection requirements is required to be inspected once every 12 months. ATG maybe conducting monthly 0.2 gph leak tests or Statistical Inventory Reconciliation.
- In the absence of a recognized industry procedure or manufacturer's recommended practice, the methodology outlined below (see "MDEQ Automatic Tank Gauging Equipment Inspection Procedure") may be utilized.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Automatic Tank Gauging Equipment Identification

Manufacturer	Model	Console Serial Number

Type of Leak Detection: Tank 0.2 gph leak tests: (☐ Static ☐ Continuous) ☐ Statistical Inventory Reconciliation ☐ Electronic Line Leak Detector (0.2 or 0.1 gph leak test) ☐ Other:

MDEQ Automatic Tank Gauging Equipment Inspection Procedure

1. Inspect console and verify that it has no active or recurring history of 0.2 gph leak detection-related warnings or alarms.
2. Confirm that both the visual and audible alarms on the ATG console function correctly.
3. Verify that the correct set-up parameters are input and the automatic tank gauge is performing 0.2 gph leak testing.
4. Measure the fuel and water contents of the tank and compare with the ATG inventory report ensuring that they are the same.
5. Remove tank probes and clean ensuring all floats move freely without binding and that the probe is in good condition.
6. Ensure that the probe fuel and water floats are the correct type for the product stored in the tank.
7. Reposition the fuel and water floats, measure distance from bottom of the probe, and utilize tank charts to confirm accuracy of the ATG report for all manually obtained fuel or water levels.
8. Reinstall probes ensuring that the tank riser cap seals properly and the communication cable seal is tight.
9. If ATG is equipped with printer, attach the printed ATG set-up information to this form.

Inspection Results for the Year

Tank / Compartment Identification						
Probe Serial Number						
Console functions are normal and no alarm condition exists	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Visual and audible alarms tested and function correctly	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Correct parameters are input and leak testing performed	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
All tank probes are in good condition and functioning properly	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Manually obtained fuel levels indicate ATG inventory is correct	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Manually obtained water levels indicate ATG inventory is correct	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Tank cap, seals and communication cable are in good condition	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
ATG Set-up Information attached	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Inspection Result (Pass/Fail)						

Comments:

ATG Annual Inspections

- Do you have to pull the probe?
- With the probe above ground reconnect it.
  - Slowly raise the water float until it triggers “Water Warning” / “High water limit” on ATG.
  - Measure from the bottom of the probe to the bottom of the water float.
    - Does it match what’s programed in the ATG?
  - Do the same procedure for fuel float for near the middle of tank & at top of tank when it triggers “Overfill Alarm”.
    - Does it match what’s programed in the ATG?

---- IN-TANK ALARM -----
T 1:UNLEADED
MAX PRODUCT ALARM
APR 3, 2019 3:14 PM

---- IN-TANK ALARM -----
T 3:DIESEL
HIGH PRODUCT ALARM
APR 3, 2019 3:14 PM

---- IN-TANK ALARM -----
T 2:PREMIUM
OVERFILL ALARM
APR 3, 2019 3:14 PM

- MDEQ inspectors do look for these alarms.
  - If we don’t see them what are we to think?

ATG Annual Inspections

What about that programing?

```
IN-TANK SETUP
- - - - - - - - - - - -

T 1:REGULAR ULD
PRODUCT CODE     :      1
THERMAL COEFF    :.000070
TANK DIAMETER    :  96.00
TANK PROFILE     :   1 PT
       FULL VOL  :  12032

FLOAT SIZE:   4.0 INCHES

WATER WARNING    :    5.0
HIGH WATER LIMIT:    5.0

MAX OR LABEL VOL:  12032
OVERFILL LIMIT   :    96%
                 :  11550
HIGH PRODUCT     :    95%
                 :  11430
DELIVERY LIMIT   :    10%
                 :   1203

LOW PRODUCT      :   1500
LEAK ALARM LIMIT:     99
SUDDEN LOSS LIMIT:150000
TANK TILT        :   0.00

MANIFOLDED TANKS
T#: NONE

LEAK MIN ANNUAL : 10828

PERIODIC TEST TYPE
                      QUICK

ANNUAL TEST FAIL
            ALARM DISABLED

PERIODIC TEST FAIL
            ALARM DISABLED

GROSS TEST FAIL
            ALARM DISABLED

ANN TEST AVERAGING:  OFF
PER TEST AVERAGING:  OFF

TANK TEST NOTIFY:    OFF

TNK TST SIPHON BREAK:OFF

DELIVERY DELAY  :  2 MIN
```

- Tank profile:
  - 1 point is fine for cylinder tank.
  - 4 is Required for “Fiberglass Tank”. (Use Tank Chart)
- Water Warning & High Water Limit:
  - Should match what you simulate with probe pulled.
- Max or Label Vol: 100%
  - Tank capacity as it appears on tank chart.
- Overfill Limit & High Product:
  - Should match what you simulate with probe pulled.
- Tank Tilt
- Manifolded Tanks:
  - Are the tanks manifolded / Siphoned? It should show it.

Tank tilt & ATG programing

Should you be checking tank tilt already?

- Yes.
- Tank tilt can be entered as + / – tilt.
- Follow manufacturers instructions
- Accuchart?
  - If dispensers out of calibration:
    - Tank Chart in ATG out of Calibration.
    - Monthly 0.2 gph Static or CSLD potentially impacted
- Tilt should be verified when inspecting ATG programing.
- ATG requires accurate chart to produce accurate 0.2 gph leak test.

Calculating Tank Tilt

Use the worksheet in Table 5 to record measurements and perform Tank Tilt calculations for up to six tanks.

1. Stick the tank at the fill riser opening at least three times. Enter the average reading in column A of the worksheet.
2. Stick the tank at the probe riser at least three times. Enter the average reading in column B of the worksheet.
3. Subtract the fuel height at the probe riser from the height at the fill riser (A-B = C). Enter the result in column C of the worksheet.
4. Measure the distance between the probe and fill risers. Enter the measurement in column D of the worksheet.
5. Divide the value in column C by that in column D to determine the pitch. Enter the quotient in column E of the worksheet.
6. Measure the distance from the probe riser to the center of the tank. Enter the distance in column F of the worksheet.
7. Multiply column E by column F to determine Tank Tilt. Enter the product in column G of the worksheet.
8. Enter the tank tilt (column G) from the worksheet for the selected tank.

Table 5.- Tank Tilt Calculation Worksheet

Tank	A Fuel Height @ Fill Riser	B Fuel Height @ Probe Riser	C (A-B=C)	D Distance Fill to Probe Risers	E Pitch (C÷D = E)	F Distance Probe Riser to Center of Tank	G Tank Tilt (E x F)
1							
2							
3							
4							
5							
6							

ATG Annual Inspections

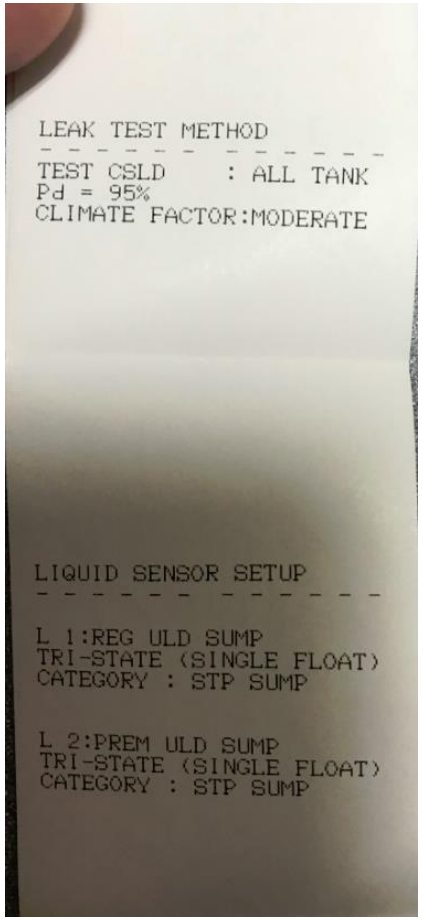
What about that programing?

- Thermal Coefficent: (Veeder-root)
  - 0.0007 for Regular Unleaded
  - 0.00045 for Diesel
  - 0.00044 for 100% Biodiesel
  - 0.0005 for Kerosene
- What about ethanol blends?
  - Gasohol (~10% ethanol) = 0.00069
- Would it make much of a difference?
  - Possibly if tank is on verge of 0.2 failure.
  - Likely impacts CSLDs more than Static tests
- Check with ATG manufacturer to verify

Product	Thermal Coefficient (U.S. Units)	Thermal Coefficient (Metric Units)
AdBlue or DEF	0.00040	0.00022
Alcohol	0.00063	0.00114
Aviation Gas	0.00075	0.00135
Diesel (fuel oil #2) [DERV]	0.00045	0.00081
<Derv> Biodiesel (B20)	0.00045	0.00081
<Derv> Biodiesel (B100)	0.00044	0.00079
Ethylene Glycol	0.00037	0.00067
Fuel Oil #4	0.00047	0.00085
Gasohol	0.00069	0.00125
Gear Oil, 90W	0.00047	0.00085
Hydraulic Oil	0.00047	0.00085
Jet Fuel	0.00047	0.00085
Kerosene (fuel oil #1) [Paraffin]	0.00050	0.00090
Liquefied Petroleum Gas (LPG)	0.00160	0.00288
Leaded	0.00070	0.00126
Motor Oil	0.00047	0.00085
Premium [4 Star]	0.00070	0.00126
Regular Unleaded	0.00070	0.00126
Super Unleaded	0.00070	0.00126
Low benzene unleaded petrol	0.00070	0.00126
Transmission Fluid	0.00047	0.00085
Turbine Oil	0.00047	0.00085

ATG Annual Inspections

Leak Test Method

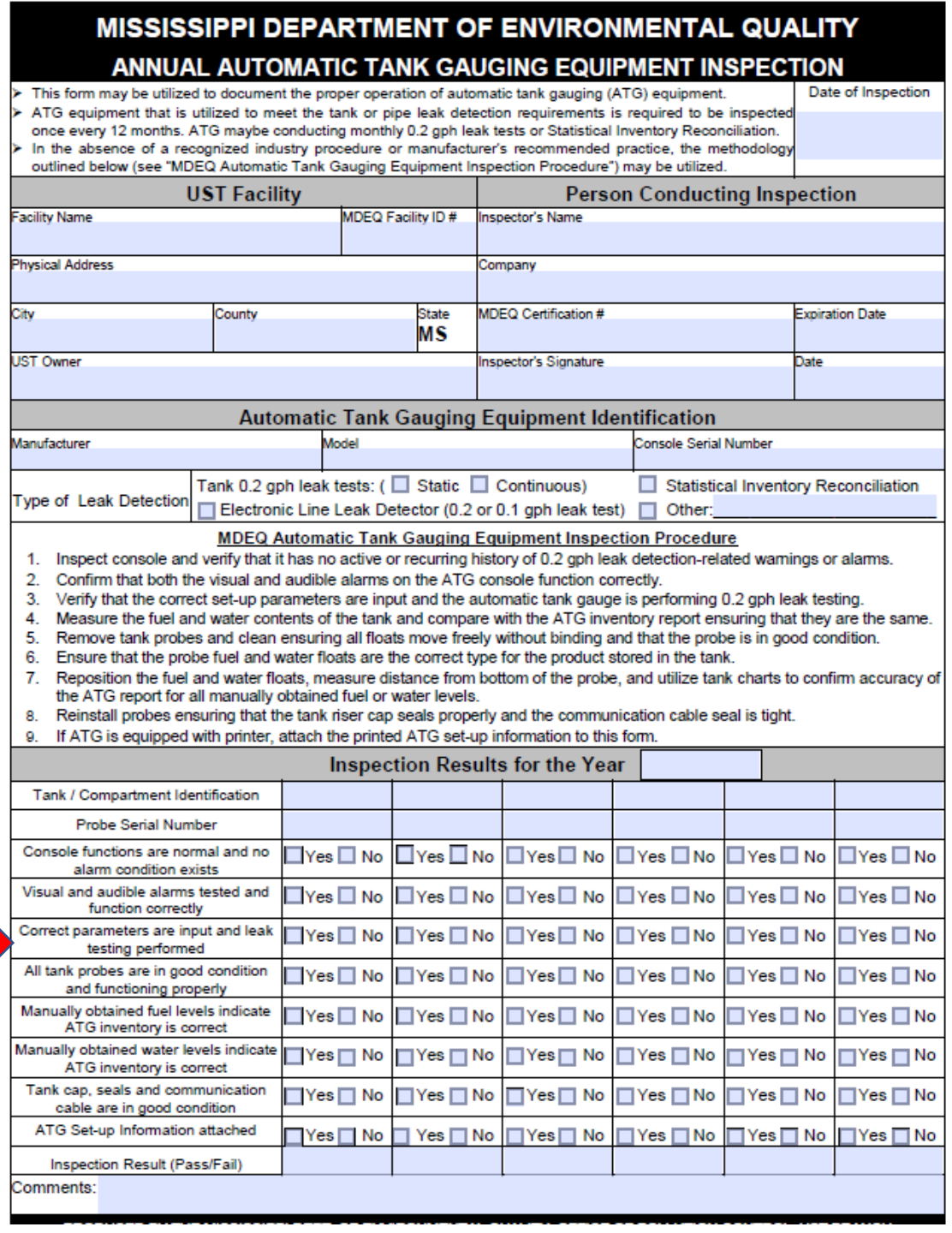


- Pd = 95% is typical. 99% is more stringent test.
- Climate Factor:
  - Should be set for Moderate. (Were not in a desert)
  - Extreme is other option. (Care should be used before you select it. All other ATG programing / tilt should be checked.)
- “Static” test is preferred. (if facility closes at night time)
- “CSLD” is necessary if site is open 24/7
- High throughput facilities may have trouble passing “CSLDs”
  - Owner should switch to CITLDs – (Warren Rogers for ex.)

ATG Annual Inspection

Electronic LLDs

- If pipe leak detection is annual LTT then they do not have to do this.
  - Check Registration for facility.
- Correct parameters are input?
  - Question is on ATG & LLD test form
    - If general, if PLLD passes 3 gph LLD test you simulate pass it on LLD test form.
    - Programed parameters are more critical for 0.2 & 0.1 gph leak tests



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC TANK GAUGING EQUIPMENT INSPECTION

- This form may be utilized to document the proper operation of automatic tank gauging (ATG) equipment.
- ATG equipment that is utilized to meet the tank or pipe leak detection requirements is required to be inspected once every 12 months. ATG maybe conducting monthly 0.2 gph leak tests or Statistical Inventory Reconciliation.
- In the absence of a recognized industry procedure or manufacturer's recommended practice, the methodology outlined below (see "MDEQ Automatic Tank Gauging Equipment Inspection Procedure") may be utilized.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Automatic Tank Gauging Equipment Identification

Manufacturer	Model	Console Serial Number

Type of Leak Detection: Tank 0.2 gph leak tests: (☐ Static ☐ Continuous) ☐ Statistical Inventory Reconciliation; ☐ Electronic Line Leak Detector (0.2 or 0.1 gph leak test) ☐ Other:

MDEQ Automatic Tank Gauging Equipment Inspection Procedure

1. Inspect console and verify that it has no active or recurring history of 0.2 gph leak detection-related warnings or alarms.
2. Confirm that both the visual and audible alarms on the ATG console function correctly.
3. Verify that the correct set-up parameters are input and the automatic tank gauge is performing 0.2 gph leak testing.
4. Measure the fuel and water contents of the tank and compare with the ATG inventory report ensuring that they are the same.
5. Remove tank probes and clean ensuring all floats move freely without binding and that the probe is in good condition.
6. Ensure that the probe fuel and water floats are the correct type for the product stored in the tank.
7. Reposition the fuel and water floats, measure distance from bottom of the probe, and utilize tank charts to confirm accuracy of the ATG report for all manually obtained fuel or water levels.
8. Reinstall probes ensuring that the tank riser cap seals properly and the communication cable seal is tight.
9. If ATG is equipped with printer, attach the printed ATG set-up information to this form.

Inspection Results for the Year

Tank / Compartment Identification						
Probe Serial Number						
Console functions are normal and no alarm condition exists	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Visual and audible alarms tested and function correctly	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Correct parameters are input and leak testing performed	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
All tank probes are in good condition and functioning properly	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Manually obtained fuel levels indicate ATG inventory is correct	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Manually obtained water levels indicate ATG inventory is correct	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Tank cap, seals and communication cable are in good condition	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
ATG Set-up Information attached	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No	☐Yes ☐ No
Inspection Result (Pass/Fail)						

Comments:

ATG Annual Inspections

Electronic LLDs

- Correct Parameters?
  - Type of pipe – select most appropriate option.

    Check with ATG manufacturer
  - Pipe Diameter & Length
  - Dispenser Mode:
    - Standard – 1 STP
    - Other options multiple STPs / pipe man folded / cycling.
  - Non-Vented:
    - Newer PLLDs serial #'s > 100,000 (veederoot)
    - Pressure Offset (based on altitude, sea level – 2000 ft)
      - Typically 0 psi (Range 0-25 psi)
      - Can have significant impact on 0.2 & 0.1 test
  - Vented: Older PLLDs

ATG Annual Inspections

Electronic LLDs – Installation Issues

Red Jacket

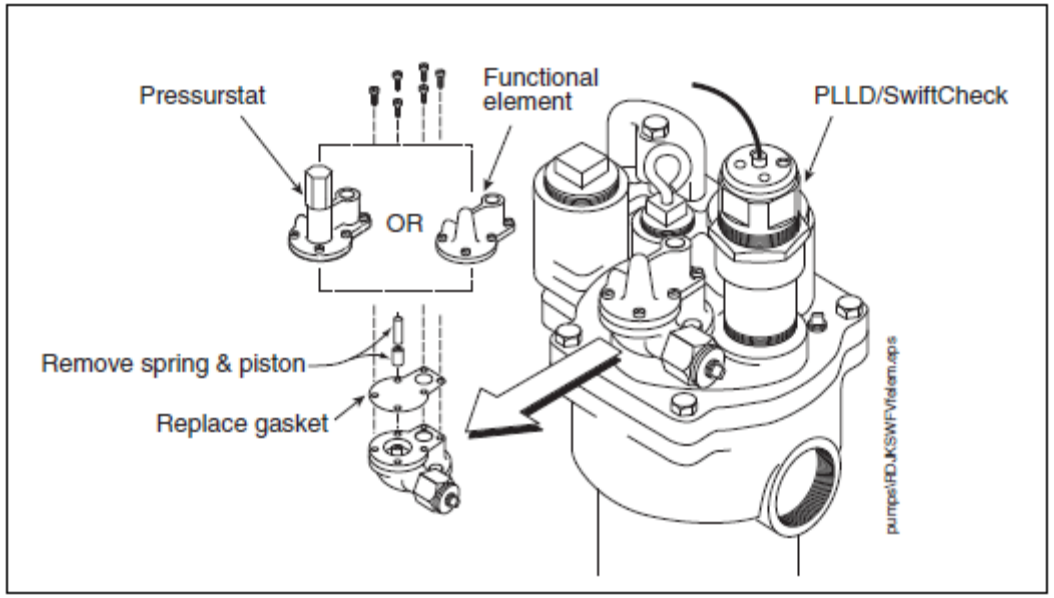


Figure 6. Modifying The Pressurstat/Functional Element In Red Jacket Pumps

9. The PLLD SwiftCheck valve eliminates the need for the pump's Pressurstat or functional element relief valve so it must be modified as part of the PLLD system installation. Remove the six 1/4-28 slot-head screws from the Pressurstat or functional element [Figure 6].
10. Remove the spring, piston and diaphragm.
11. Carefully reassemble the Pressurstat or functional element using a new diaphragm suitable for the fuel involved. Be sure that all mating surfaces are free from debris when reinstalling.

FE Petro – Model R precision check valve

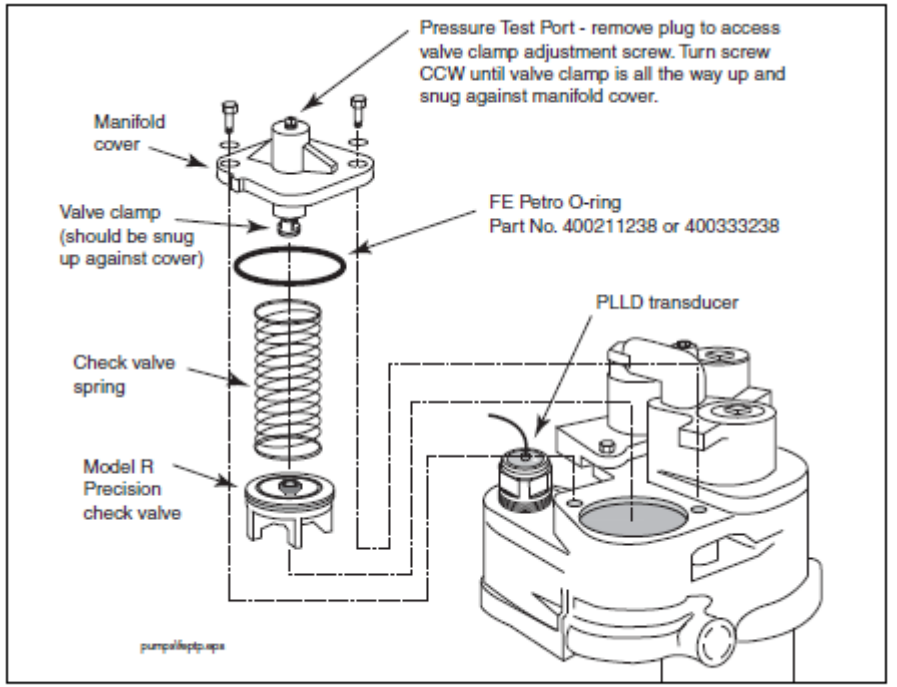


Figure 12. Location Of PLLD Transducer And Model R Precision Check Valve In FE Petro Pump

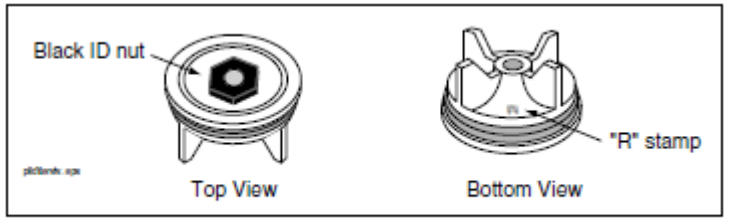


Figure 13. Identifying A FE Petro "R" Style Precision Check Valve

ATG Annual Inspections

Documentation

- You should at a minimum keep:
  - ATG Setup information printed off
  - In-tank probe alarm reports generated
    - Overfill Alarm
    - High Water Alarm
    - Etc.
- That is your proof that:
  - you did a good test.
  - ATG was programmed properly

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC TANK GAUGING EQUIPMENT INSPECTION

- This form may be utilized to document the proper operation of automatic tank gauging (ATG) equipment.
- ATG equipment that is utilized to meet the tank or pipe leak detection requirements is required to be inspected once every 12 months. ATG maybe conducting monthly 0.2 gph leak tests or Statistical Inventory Reconciliation.
- In the absence of a recognized industry procedure or manufacturer's recommended practice, the methodology outlined below (see "MDEQ Automatic Tank Gauging Equipment Inspection Procedure") may be utilized.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State: MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	Date

Automatic Tank Gauging Equipment Identification

Manufacturer	Model	Console Serial Number

Type of Leak Detection: Tank 0.2 gph leak tests: (☐ Static ☐ Continuous) ☐ Statistical Inventory Reconciliation; ☐ Electronic Line Leak Detector (0.2 or 0.1 gph leak test) ☐ Other:

MDEQ Automatic Tank Gauging Equipment Inspection Procedure

1. Inspect console and verify that it has no active or recurring history of 0.2 gph leak detection-related warnings or alarms.
2. Confirm that both the visual and audible alarms on the ATG console function correctly.
3. Verify that the correct set-up parameters are input and the automatic tank gauge is performing 0.2 gph leak testing.
4. Measure the fuel and water contents of the tank and compare with the ATG inventory report ensuring that they are the same.
5. Remove tank probes and clean ensuring all floats move freely without binding and that the probe is in good condition.
6. Ensure that the probe fuel and water floats are the correct type for the product stored in the tank.
7. Reposition the fuel and water floats, measure distance from bottom of the probe, and utilize tank charts to confirm accuracy of the ATG report for all manually obtained fuel or water levels.
8. Reinstall probes ensuring that the tank riser cap seals properly and the communication cable seal is tight.
9. If ATG is equipped with printer, attach the printed ATG set-up information to this form.

Inspection Results for the Year ____

Tank / Compartment Identification						
Probe Serial Number						
Console functions are normal and no alarm condition exists	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Visual and audible alarms tested and function correctly	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Correct parameters are input and leak testing performed	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
All tank probes are in good condition and functioning properly	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Manually obtained fuel levels indicate ATG inventory is correct	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Manually obtained water levels indicate ATG inventory is correct	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Tank cap, seals and communication cable are in good condition	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
ATG Set-up Information attached	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Inspection Result (Pass/Fail)						

Comments:

Annual Electronic Interstitial Device Test (sensors)

- You should confirm that each sensor is registered properly in ATG.
  - For Ex. STP sump sensor should NOT alarm as Disp ½ sensor
- You should at a minimum keep:
  - sensor alarm reports generated.
- That is your proof you tested the sensor.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL ELECTRONIC INTERSTITIAL MONITORING DEVICE TESTING

- This form may be utilized to document functionality testing of electronic interstitial monitoring devices.
- Testing of electronic interstitial monitoring devices is required at least once every 12 months.
- In the absence of an approved 3rd party test procedure or manufacturer's recommended practice, the "MDEQ Electronic Monitoring Device Test Procedure" outlined below may be utilized.

Date of Test

UST Facility			Person Conducting Test	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City / County / State (MS)			MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

Electronic Interstitial Monitoring Device Testing

Reason for Test	☐ New Installation ☐ Existing Installation (annual test)
Type of Sensor	☐ Float Switch (☐ discriminating ☐ non-discriminating)
	☐ Optical Sensor ☐ Electrical Resistance Sensor
	☐ Pressure / Vacuum Monitoring Device ☐ Other (specfy)_____

MDEQ Electronic Monitoring Device Test Procedure

1. Confirm that the electronic monitoring device is properly installed and labeled properly.
2. Visually examine the device to ensure that it is not damaged or corroded and any moving parts are free.
3. Cause a condition that should trigger the sensor to alarm (submerge sensor in appropriate fluid).
4. Ensure that the alarm condition causes the appropriate response (e.g. visual and audible alarms, STP shutdown, etc)
5. Note in the facility alarm history records that this alarm was the result of an annual functionality test.
6. Ensure that the electronic interstitial monitoring device is reinstalled properly.
7. If ATG is equipped with printer, attach the printed alarm reports that resulted from sensor testing to this form.

Test Data for the Year _____

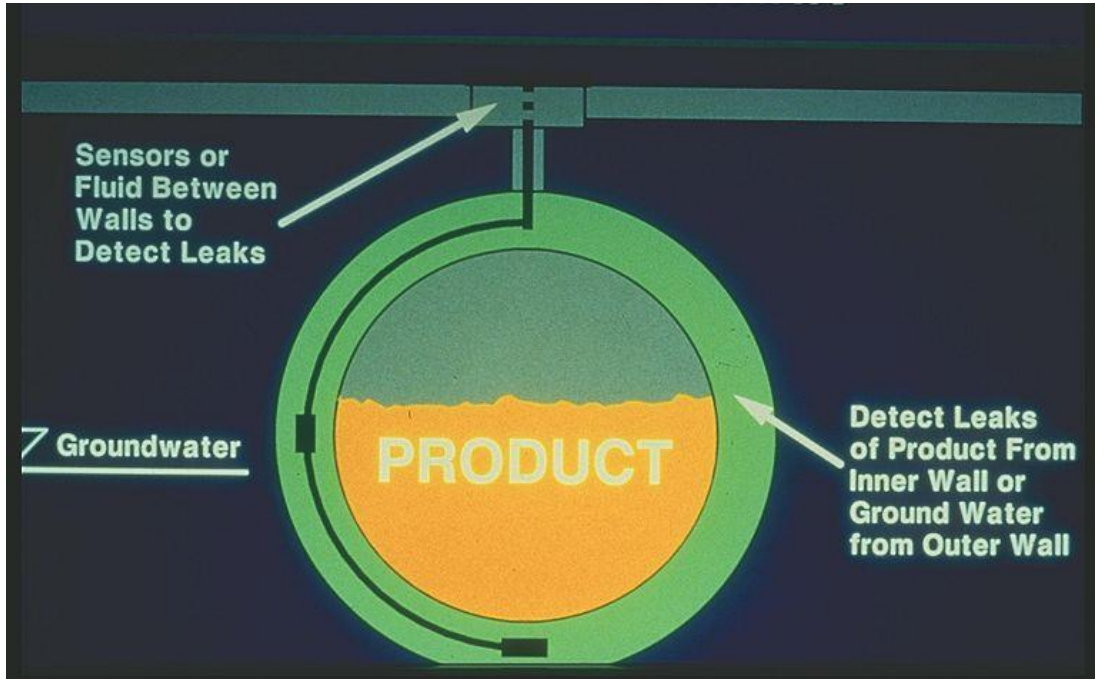
Sensor ID (Location)								
Sensor Installed Correctly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Sensor in Good Condition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
When placed in test fluid, does the sensor trigger a Visual and Audible Alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
When placed in test fluid, does the sensor trigger STP or Dispenser Shutdown	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Sensor labeled properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Alarm reports printed and attached (Yes / No / NA)								
Test Result (Pass/Fail)								

Comments:

PRODUCED BY THE MISSISSIPPI DEPT. OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE (601) 961-5171 FAX (601) 961-5093 http:// www.deq.state.ms.us 1/18

Sensor Positioning

- What good will it do if it’s not at the bottom?
- You should confirm that sensor is reinstalled at bottom of tank Interstices.
- Within 1” of bottom of sumps.



Annual Spill Bucket Testing

- Why should you test 1.5” below top?
  - Tight fill loosens commonly.
  - Fuel will leak around tight fill
  - Fills spill buckets during deliveries
  - Bucket may fill with fuel above the fill port.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL SPILL BUCKET INTEGRITY TESTING

- This form may be utilized to document integrity testing of spill containment buckets.
- Testing of all spill buckets is required at installation and at least once every 12 months thereafter.
- In the absence of an approved 3rd party test procedure or manufacturer's recommended practice, the test method outlined below in the “MDEQ Hydrostatic Test Procedure” section may be utilized.

Date of Test

UST Facility		Person Conducting Test	
Facility Name	MDEQ Facility ID #	Tester's Name	
Physical Address		Company	
City / County / State (MS)		MDEQ Certification #	Expiration Date
UST Owner		Tester's Signature	Date

Spill Bucket Testing

Reason for Test	☐ New Installation ☐ Existing Installation (annual test) ☐ Release Investigation
Construction	☐ Single-Walled ☐ Double-Walled ☐ Spill Bucket Liner ☐ Unknown
Type of Test	☐ Hydrostatic (Complete “Test Data” table below)
	☐ Vacuum (Attach test equipment manufacturer's data sheet/test protocol to this form)
	☐ Other (Specify)

MDEQ Hydrostatic Test Procedure

1. Clean out and properly dispose of all debris, soil and/or fluids from the spill bucket.
2. Visually examine to ensure there are no cracks, holes, or broken seals and the fill cap seals properly.
   Note: If the fill cap does not seal – Remove adapter and drop tube and seal tank fill riser with a plumbers plug.
3. Fill with water to within 1 ½ inches of top and let stand 5 minutes to allow water to reach ambient temperature.
4. After 5 minutes has elapsed, document the initial water level measurement as measured from the bottom of the spill bucket to the nearest 1/16th inch.
5. Leave the spill bucket undisturbed for at least one hour then compare the starting fluid level to the ending level.
   Note: For accuracy, the location where both the initial and final fluid levels are measured should be the same.
6. If the fluid level is the same or it has changed by 1/8th inch or less the spill bucket passes the test.
7. If the fluid level is different by more than 1/8th inch, the spill bucket fails the test.
   Note: A leak less than 1/8th of an inch is still critical if the tank is using vapor monitoring as their method of leak detection For tests performed as part of a release investigation, fluid level readings should be taken very carefully.
8. Properly dispose of all test fluids at the conclusion of testing.

Note: MDEQ certification as a UST installer is required to install spill containment devices.

Test Data for the Year

Tank ID (product stored)					
Area of Spill Bucket Tested	☐ Single-Walled ☐ Double-Walled	☐ Single-Walled ☐ Double-Walled	☐ Single-Walled ☐ Double-Walled	☐ Single-Walled ☐ Double-Walled	☐ Single-Walled ☐ Double-Walled
Test Start Time					
Test End Time					
Test Beginning Level					
Test Ending Level					
Test Result (Pass/Fail)					

Vacuum Test – Gauge Range _____ **Gauge Units** ☐ in WC ☐ Other: _____

Comments:

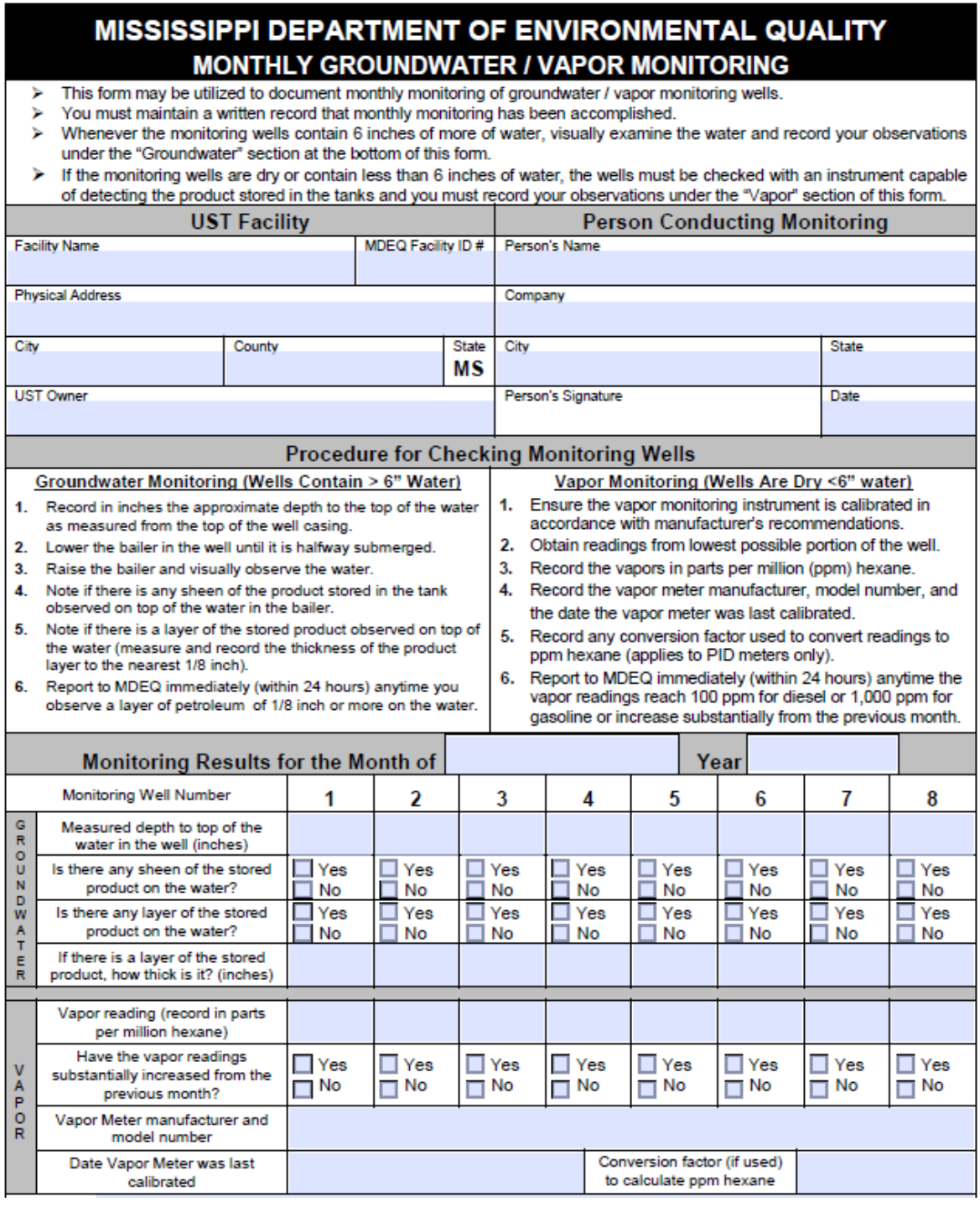
Monthly Monitoring

- Remember: What we once knew to work and work well for leak detection has changed.
- Every method has certain scenarios where:
  - It can be out smarted.
  - A leak may take a long time to catch
  - Or may not be caught
- Goal for this section is to:
  - Provide training & share ideas
  - To know what to teach the tank owners doing their own monthly monitoring
  - Help spread the word on issues / newer requirements.

Ground Water Vapor monitoring

- Remember Reportable Amounts
- Groundwater: 1/8 inch or more
- Vapors:
  - 100 ppm for diesel
  - 1000 ppm for gas
  - OR substantial increase from previous month (Not so significant for diesel)

- Can leaks be masked?
- What does it depend on?



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
MONTHLY GROUNDWATER / VAPOR MONITORING

- This form may be utilized to document monthly monitoring of groundwater / vapor monitoring wells.
- You must maintain a written record that monthly monitoring has been accomplished.
- Whenever the monitoring wells contain 6 inches of more of water, visually examine the water and record your observations under the "Groundwater" section at the bottom of this form.
- If the monitoring wells are dry or contain less than 6 inches of water, the wells must be checked with an instrument capable of detecting the product stored in the tanks and you must record your observations under the "Vapor" section of this form.

UST Facility			Person Conducting Monitoring	
Facility Name	MDEQ Facility ID #		Person's Name	
Physical Address			Company	
City	County	State MS	City	State
UST Owner			Person's Signature	Date

Procedure for Checking Monitoring Wells

Groundwater Monitoring (Wells Contain > 6" Water)

1. Record in inches the approximate depth to the top of the water as measured from the top of the well casing.
2. Lower the bailer in the well until it is halfway submerged.
3. Raise the bailer and visually observe the water.
4. Note if there is any sheen of the product stored in the tank observed on top of the water in the bailer.
5. Note if there is a layer of the stored product observed on top of the water (measure and record the thickness of the product layer to the nearest 1/8 inch).
6. Report to MDEQ immediately (within 24 hours) anytime you observe a layer of petroleum of 1/8 inch or more on the water.

Vapor Monitoring (Wells Are Dry <6" water)

1. Ensure the vapor monitoring instrument is calibrated in accordance with manufacturer's recommendations.
2. Obtain readings from lowest possible portion of the well.
3. Record the vapors in parts per million (ppm) hexane.
4. Record the vapor meter manufacturer, model number, and the date the vapor meter was last calibrated.
5. Record any conversion factor used to convert readings to ppm hexane (applies to PID meters only).
6. Report to MDEQ immediately (within 24 hours) anytime the vapor readings reach 100 ppm for diesel or 1,000 ppm for gasoline or increase substantially from the previous month.

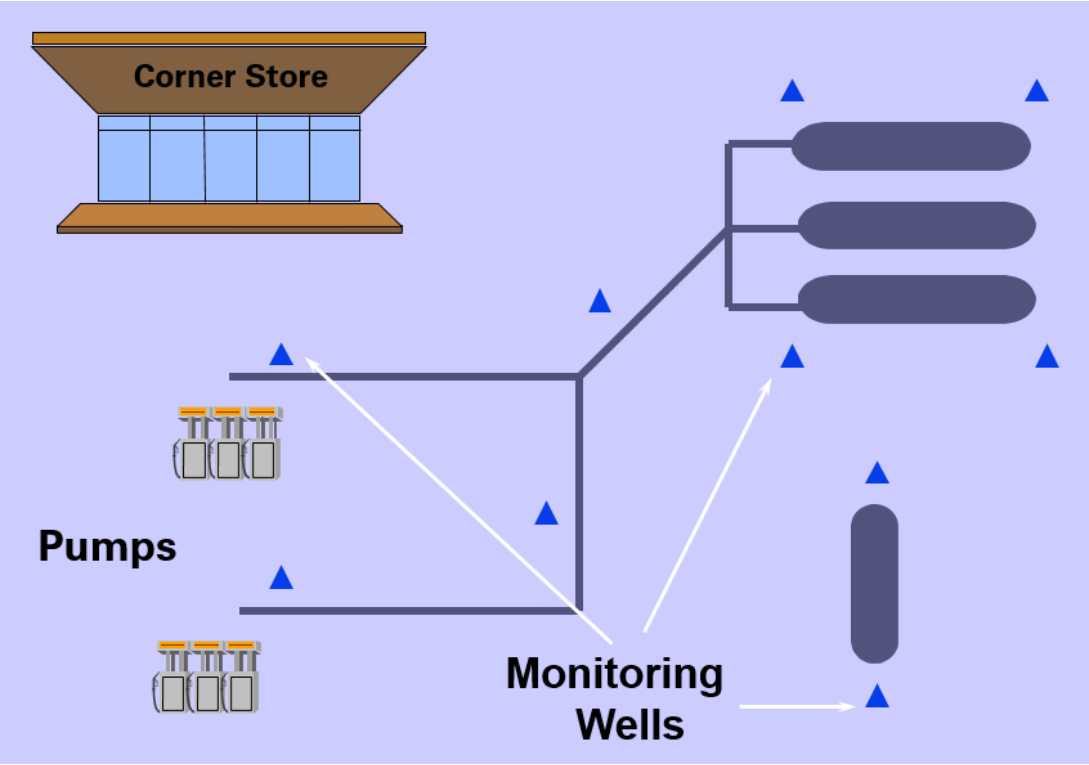
Monitoring Results for the Month of _____ **Year** _____

	Monitoring Well Number	1	2	3	4	5	6	7	8
GROUNDWATER	Measured depth to top of the water in the well (inches)								
	Is there any sheen of the stored product on the water?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Is there any layer of the stored product on the water?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	If there is a layer of the stored product, how thick is it? (inches)								
VAPOR	Vapor reading (record in parts per million hexane)								
	Have the vapor readings substantially increased from the previous month?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Vapor Meter manufacturer and model number								
	Date Vapor Meter was last calibrated					Conversion factor (if used) to calculate ppm hexane			

Ground Water / Vapor monitoring

(potential issues)

- What is the back fill material?
  - Has to be porous enough for fuel or vapors to travel through quickly
  - There is a way to tell. – Plug test
- Is native soil different?
  - Does it matter?
- Location of the wells?
  - In tank bed? Near tanks?
    - Does it matter?
- Are there blind spots?
- Expect guidance to come soon from DEQ



Ground Water / Vapor monitoring

(potential issues)

- Can the groundwater be to high?
  - Well casings may prevent detection.
- If groundwater high enough leak is more likely to show up in:
  - STP manways on top of water
  - Under dispensers on top of water
- Perhaps, before it ever shows up in a well.

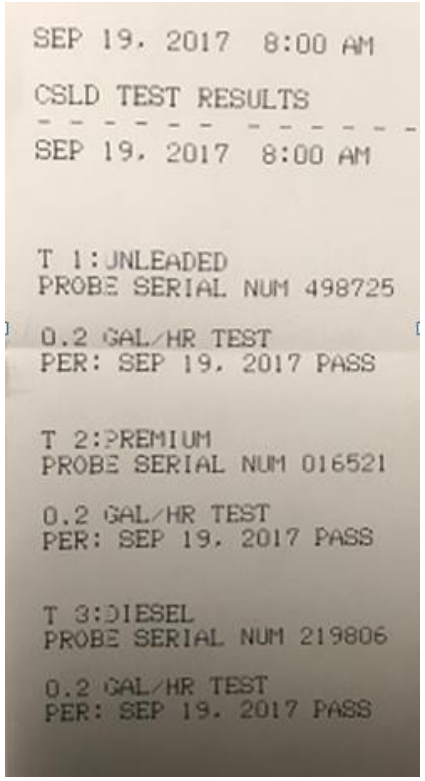
- Monthly walk throughs (recommended section) encourage looking at all locations for fuel.

ATG Monthly Leak detection

Static or CSLDs 0.2 gph tank leak detection

Once a month:

Print Off recent test ***OR*** **Leak History for the year**



SEP 19. 2017 8:00 AM

CSLD TEST RESULTS

SEP 19. 2017 8:00 AM

T 1:UNLEADED
PROBE SERIAL NUM 498725

0.2 GAL/HR TEST
PER: SEP 19. 2017 PASS

T 2:PREMIUM
PROBE SERIAL NUM 016521

0.2 GAL/HR TEST
PER: SEP 19. 2017 PASS

T 3:DIESEL
PROBE SERIAL NUM 219806

0.2 GAL/HR TEST
PER: SEP 19. 2017 PASS

CROSSROADS
2796 SOUTH HARPER RD
CORINTH MS
38834

DEC 12. 2014 1:41 PM

TANK LEAK TEST HISTORY

T 1:UNLD

LAST GROSS TEST PASSED:
APR 5. 2011 6:00 PM
STARTING VOLUME= 13785
PERCENT VOLUME = 90.2
TEST TYPE = STANDARD

LAST ANNUAL TEST PASSED:
APR 5. 2011 6:00 PM
TEST LENGTH 4 HOURS
STARTING VOLUME= 13785
PERCENT VOLUME = 90.2
TEST TYPE = STANDARD

FULLEST ANNUAL TEST PASS
APR 5. 2011 6:00 PM
TEST LENGTH 4 HOURS
STARTING VOLUME= 13785
PERCENT VOLUME = 90.2
TEST TYPE = STANDARD

LAST PERIODIC TEST PASS:
DEC 12. 2014 4:35 AM
TEST LENGTH 30 HOURS
STARTING VOLUME= 7007
PERCENT VOLUME = 45.9
TEST TYPE = CSLD

FULLEST PERIODIC TEST
PASSED EACH MONTH:

JAN 14. 2014 3:29 AM
TEST LENGTH 30 HOURS
STARTING VOLUME= 8446
PERCENT VOLUME = 55.3
TEST TYPE = CSLD

FEB 11. 2014 5:27 AM
TEST LENGTH 34 HOURS
STARTING VOLUME= 6931
PERCENT VOLUME = 45.4
TEST TYPE = CSLD

MAR 30. 2014 6:34 AM
TEST LENGTH 31 HOURS
STARTING VOLUME= 6363
PERCENT VOLUME = 41.7
TEST TYPE = CSLD

APR 22. 2014 1:22 AM
TEST LENGTH 30 HOURS
STARTING VOLUME= 7310
PERCENT VOLUME = 47.9
TEST TYPE = CSLD

ATG Monthly Leak detection

Static or CSLDs 0.2 gph tank leak detection

- What else should be done?
- DEQ recommends printing off: *<u>In-tank alarm history</u>*
  - Look for:
    - Periodic Test fails
      - Routine fails may indicate a slow leak / bad programing
    - Overfill alarms
      - Indicate OF device may not be set / functioning right
    - High water warning / alarm
      - Routine alarms will indicate water intrusion issues early on.
- DEQ inspectors should check for these. By you watching it gives tank owner advantage to correct issues early.

ALARM HISTORY REPORT

---- IN-TANK ALARM -----

T 1:REGULAR ULD

SETUP DATA WARNING
APR 12. 1995 2:48 PM

LEAK ALARM
SEP 11. 1932 0:04 PM

HIGH WATER ALARM
AUG 22. 2011 2:45 PM
MAR 7. 1995 2:33 PM
MAY 6. 1995 7:51 PM

OVERFILL ALARM
OCT 8. 2014 1:24 AM
JUN 4. 2012 11:10 AM
APR 19. 2006 3:47 PM

LOW PRODUCT ALARM
MAY 3. 2018 5:33 AM
APR 30. 2018 1:28 PM
APR 20. 2018 12:32 PM

SUDDEN LOSS ALARM
DEC 26. 1995 7:55 AM

HIGH PRODUCT ALARM
DEC 16. 2014 4:00 PM
OCT 8. 2014 1:13 AM
JUN 4. 2012 11:03 AM

INVALID FUEL LEVEL
MAY 3. 2018 5:05 PM
MAY 1. 2018 1:28 PM
APR 16. 2018 5:49 PM

PROBE OUT
AUG 22. 2011 2:48 PM
AUG 22. 2011 2:29 PM
AUG 22. 2011 2:31 AM

HIGH WATER WARNING
AUG 22. 2011 2:45 PM
MAY 12. 1995 2:33 PM
MAY 6. 1995 7:51 PM

DELIVERY NEEDED
MAY 3. 2018 9:22 AM
APR 30. 2018 4:27 PM
APR 20. 2018 2:40 PM

PERIODIC TEST FAIL
JUL 22. 2017 5:02 AM
JUL 5. 2017 2:49 AM
JUN 29. 2016 12:49 AM

PERIODIC TEST WARN
JUN 9. 0 0:00 AM

PERIODIC TEST ALARM
SEP 11. 1996 1:04 PM
AUG 10. 0 0:00 AM

ANNUAL TEST ALARM
SEP 7. 1996 12:00 AM

CSLD INCR RATE WARN
APR 11. 2018 4:59 AM
APR 9. 2018 11:45 PM
MAR 29. 2018 7:33 AM

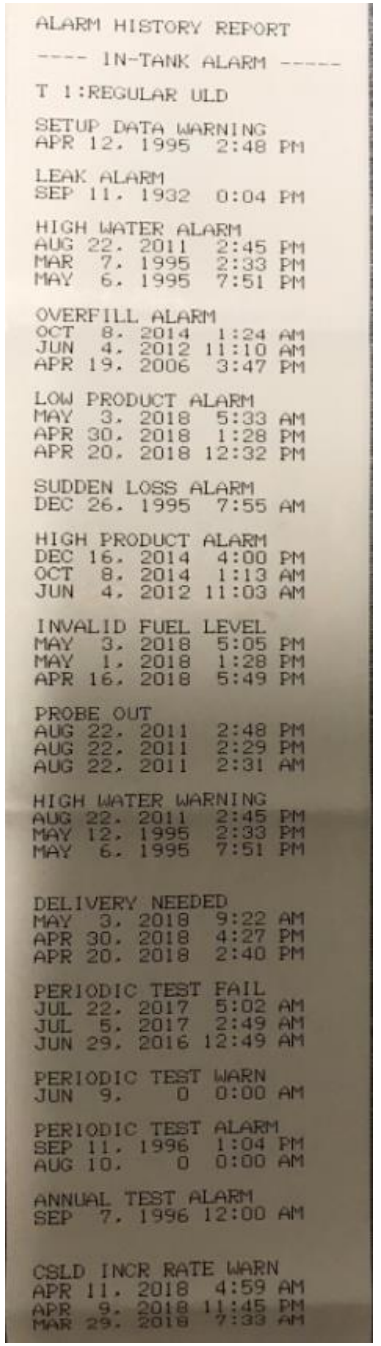
ATG Monthly Leak detection

In-Tank Alarm history

- What else can in-tank alarm history help you catch?
  - Max Product Alarm – Tank was overfilled to 100%. Faulty OF device?
  - High product Alarm – Typically set at 95%. If site is using a BF, is BF bad?
  - CSLD INCR Rate Warning – Leaky check valve in STP? Water Intrusion? Issue with tank syphon line?
  - NO CSLD Idle Time –Is the STP contact relay stuck? STP not cycling On / off? Is facility very high through-put? ATG probe damaged / corroded? Fast leak > 0.4 gph.

***Printing off the Alarm History is a very EASY way to check for these issues without opening everything up.

- Check with ATG manufacturer instructions.



ALARM HISTORY REPORT

---- IN-TANK ALARM -----

T 1:REGULAR ULD

SETUP DATA WARNING
APR 12. 1995 2:48 PM

LEAK ALARM
SEP 11. 1932 0:04 PM

HIGH WATER ALARM
AUG 22. 2011 2:45 PM
MAR 7. 1995 2:33 PM
MAY 6. 1995 7:51 PM

OVERFILL ALARM
OCT 8. 2014 1:24 AM
JUN 4. 2012 11:10 AM
APR 19. 2006 3:47 PM

LOW PRODUCT ALARM
MAY 3. 2018 5:33 AM
APR 30. 2018 1:28 PM
APR 20. 2018 12:32 PM

SUDDEN LOSS ALARM
DEC 26. 1995 7:55 AM

HIGH PRODUCT ALARM
DEC 16. 2014 4:00 PM
OCT 8. 2014 1:13 AM
JUN 4. 2012 11:03 AM

INVALID FUEL LEVEL
MAY 3. 2018 5:05 PM
MAY 1. 2018 1:28 PM
APR 16. 2018 5:49 PM

PROBE OUT
AUG 22. 2011 2:48 PM
AUG 22. 2011 2:29 PM
AUG 22. 2011 2:31 AM

HIGH WATER WARNING
AUG 22. 2011 2:45 PM
MAY 12. 1995 2:33 PM
MAY 6. 1995 7:51 PM

DELIVERY NEEDED
MAY 3. 2018 9:22 AM
APR 30. 2018 4:27 PM
APR 20. 2018 2:40 PM

PERIODIC TEST FAIL
JUL 22. 2017 5:02 AM
JUL 5. 2017 2:49 AM
JUN 29. 2016 12:49 AM

PERIODIC TEST WARN
JUN 9. 0 0:00 AM

PERIODIC TEST ALARM
SEP 11. 1996 1:04 PM
AUG 10. 0 0:00 AM

ANNUAL TEST ALARM
SEP 7. 1996 12:00 AM

CSLD INCR RATE WARN
APR 11. 2018 4:59 AM
APR 9. 2018 11:45 PM
MAR 29. 2018 7:33 AM

ATG Alarms

Trends

- It is important to pay attention to trends.
- 1 periodic 0.2 gph test fail or inconclusive does not mean tank is leaking.
  - However, you should verify programing.
  - Check GW levels / phase separation. What caused it to fail?
- Frequent periodic test fails is an issue.
- Just because you get 1 pass a month does NOT make it OK.

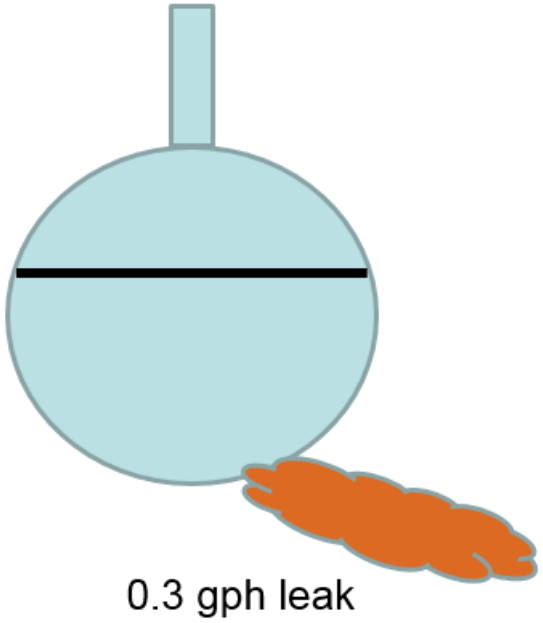
- Whether using Static or Continuous method

  Low Level testing can easily mask a leak.

Low Level Testing

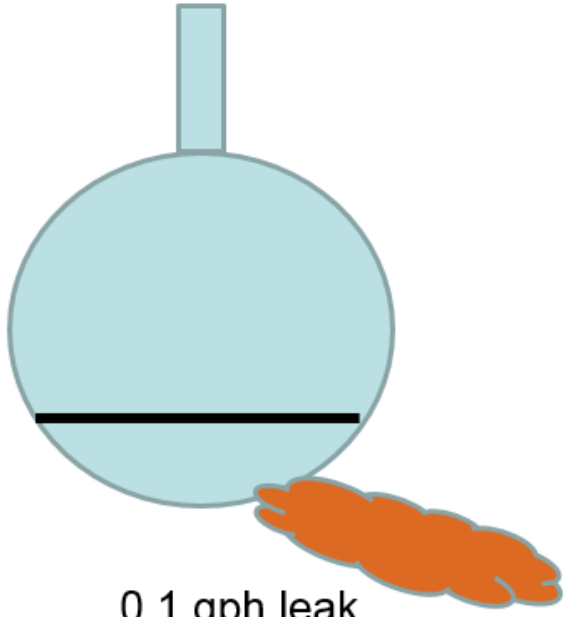
No Groundwater

Higher Fuel Level – Faster Leak Rate



0.3 gph leak

Lower Fuel Level – Slower Leak Rate

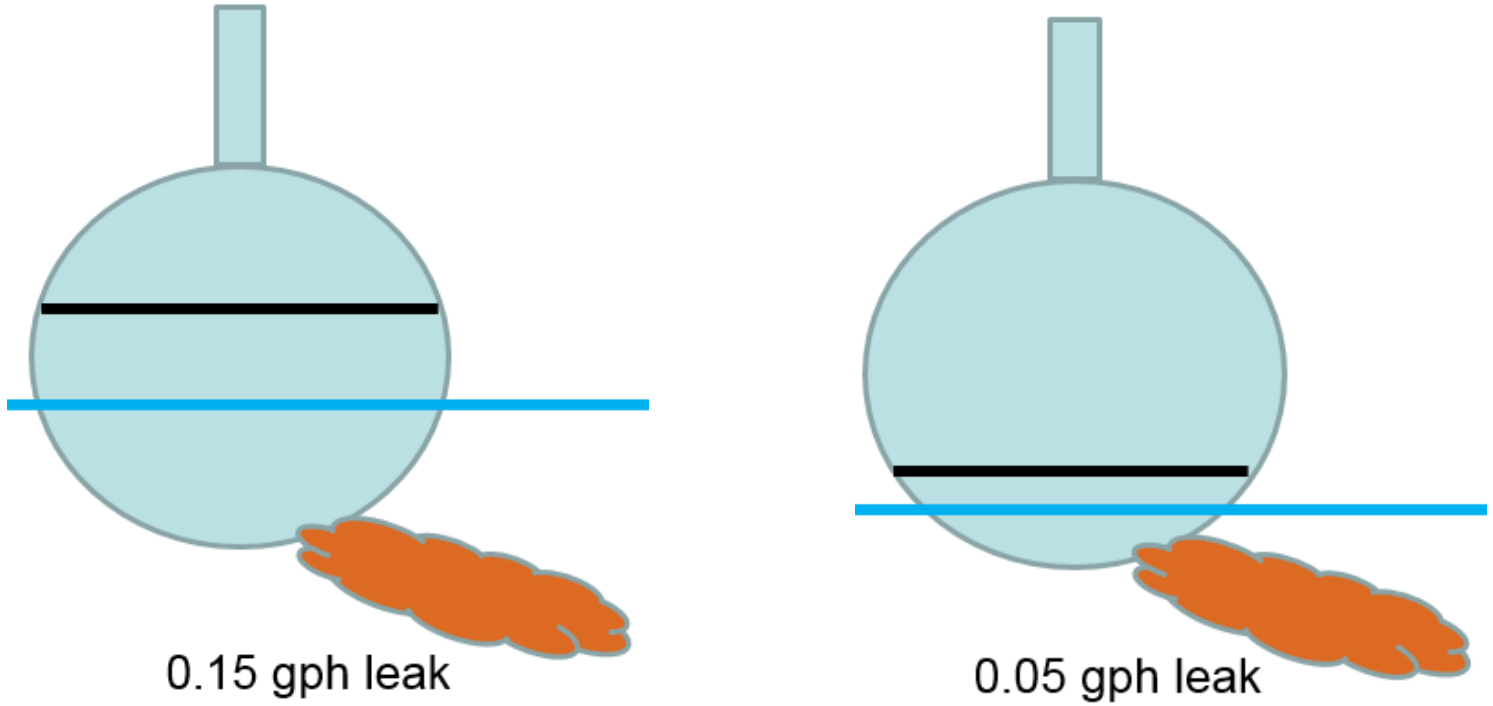


0.1 gph leak

- Same Size Hole. Different head pressures from fuel. Fuel levels fluctuate.
- That is why:
  - The Trends Matter
  - Where the fluid levels are when it fails matters.

Low Level Testing

With Groundwater

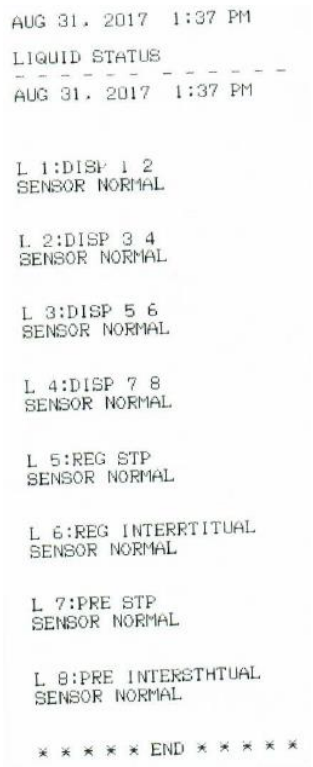


- With groundwater now you have pressure pushing back on the leak. Even slower leak rates.
- Fuel levels will fluctuate. Groundwater may or may not.
- That is why:
  - Trends matter. If you routinely have water show up at low fuel levels, you likely have an issue.
  - Routinely checking for water or phase separation matters.

Monthly Electronic Interstitial Monitoring

Sensors

Status Report



AUG 31. 2017 1:37 PM

LIQUID STATUS

AUG 31. 2017 1:37 PM

L 1:DISP 1 2
SENSOR NORMAL

L 2:DISP 3 4
SENSOR NORMAL

L 3:DISP 5 6
SENSOR NORMAL

L 4:DISP 7 8
SENSOR NORMAL

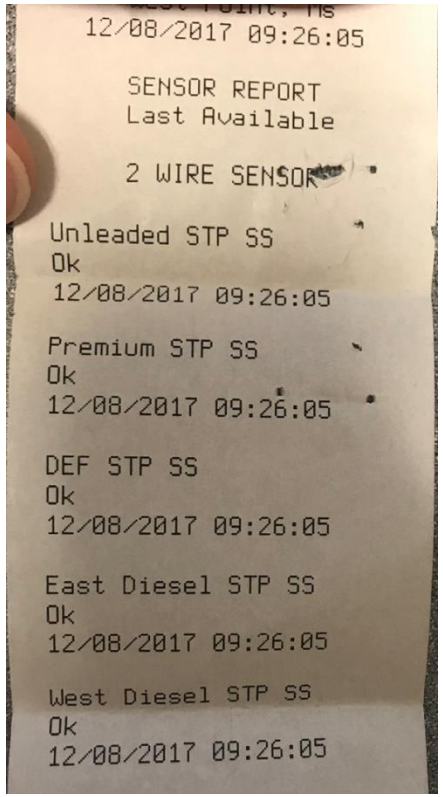
L 5:REG STP
SENSOR NORMAL

L 6:REG INTERRTITUAL
SENSOR NORMAL

L 7:PRE STP
SENSOR NORMAL

L 8:PRE INTERSTHTUAL
SENSOR NORMAL

* * * * * END * * * * *



12/08/2017 09:26:05

SENSOR REPORT
Last Available

2 WIRE SENSOR

Unleaded STP SS
Ok
12/08/2017 09:26:05

Premium STP SS
Ok
12/08/2017 09:26:05

DEF STP SS
Ok
12/08/2017 09:26:05

East Diesel STP SS
Ok
12/08/2017 09:26:05

West Diesel STP SS
Ok
12/08/2017 09:26:05

Alarm History

ALARM HISTORY REPORT

----- SENSOR ALARM -----
L 1:REG ULD SUMP
STP SUMP
FUEL ALARM
JAN 29. 2018 8:53 AM

FUEL ALARM
JAN 11. 2018 1:05 PM

FUEL ALARM
MAY 25. 2004 10:10 AM

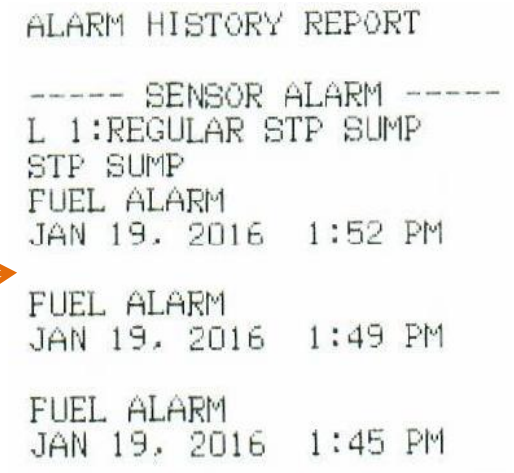
***Tank Owner is required to print off / monitor both monthly if used for leak detection.

Monthly Electronic Interstitial Monitoring

Sensors – Alarm History Report

- The reason MDEQ now requires alarm history report monthly….
- Someone had a bright idea.

  Should be no need in this.



- MDEQ wants to know history / what happened.

- Monthly alarm history print out ensures NO Alarms slip by.

ATG Remote monitoring systems

- Veeder Root Insite 360?
- In-house software?

- Report printed monthly from remote computer had better match history reports printed on site from ATG.

- IF they don’t, remote monitoring should NOT be used.

- We are aware that some tank owner in-house software has the ability to:
  - Modify reports printed.
  - Pick and choose alarms shown.
  - Delete reports.

- This isn’t acceptable.

Monthly Visual Interstitial Monitoring

- Visually inspect all sumps or stick tank interstice
- Cannot be used on Fiberglass tanks without DEQ approval
- Typically atmospheric:
  - Document fluid type and amount.
  - All fluids must be removed to < 1 inch monthly.
  - If you don't remove it don't say you did
  - Tank owner will be required to provide proof of removal of fluid

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
MONTHLY VISUAL INTERSTITIAL MONITORING

- This form may be utilized to document visual interstitial monitoring of secondarily contained UST systems.
- Interstitial monitoring is required on all secondarily contained UST systems installed after October 1, 2008.
- You must maintain a written record that monthly interstitial monitoring has been accomplished.
- If the interstice is monitored electronically, complete the form for "Electronic Interstitial Monitoring."

UST Facility			Person Conducting Monitoring	
Facility Name	MDEQ Facility ID #		Person's Name	
Physical Address			Company	
City	County	State MS	City	State
UST Owner			Person's Signature	Date

Visual Interstitial Monitoring

UST System Components Visually Monitored (check all that apply)

☐ Double-walled Tank ☐ Double-walled Pipe ☐ STP Sump ☐ Dispenser Sump ☐ Transition Sump

Interstitial Space:

☐ Atmospheric ☐ Hydrostatically Monitored (Brine Filled) ☐ Vacuum Monitored ☐ Pressure Monitored

MDEQ Visual Interstitial Monitoring Procedure

Atmospheric *(Dry Interstice)*	Hydrostatic *(Brine Filled)*	Vacuum / Pressure
1. Record whether interstice is dry or wet.	1. Record fluid level in inches.	1. Record vacuum / pressure gauge reading.
2. If wet, note whether fluid is water or fuel or both.	2. Note whether or not present fluid level is within acceptable range.	2. Note whether or not present gauge reading is within acceptable range.
3. Note amount of water / fuel in inches.	3. Specify acceptable brine range.	3. Specify acceptable range.
4. Remove all fluids from interstice.		

Monitoring Results for the Month of _____ **Year** _____

	Interstitial Space ID (product stored or dispenser number)								
	Component Monitored: Tank / Sump								
Atmospheric	Condition of interstice (Dry / Wet)	D / W	D / W	D / W	D / W	D / W	D / W	D / W	D / W
Atmospheric	If wet – Is fluid Water, Fuel or Both?	W / F	W / F	W / F	W / F	W / F	W / F	W / F	W / F
Atmospheric	If wet - Amount of fluid in inches								
Atmospheric	All fluids Removed during inspection?	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Atmospheric	Active Fuel Leaks Observed?	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Hydro	Fluid level in inches								
Hydro	Is fluid level within allowed range?	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Hydro	Specify Brine Range:								
Vacuum	Gauge reading								
Vacuum	Is gauge reading within allowed range?	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Vacuum	Specify Range:								

Comments:

Double Walled Tanks

(Interstitial Monitoring)

- DW tanks installed prior to 10/1/08
  - Are a risk if interstice is not monitored. (Approx. 670 tanks in MS)
- Hole at tank bottom.
- Tank interstice WILL build up pressure or vacuum.
  - (From fluctuating GW levels and fuel levels)
  - Higher risk with GW / fuel levels routinely in bottom quadrant of tank (Lower pressures)
- Pressure / Vac can aide the ATG in passing a 0.2 gph leak test

  (when it would normally fail on a SW tank)
- Interstice should be checked routinely for fuel / water. (even if not used for Leak detection.)
- Water will cause further corrosion on primary tank. (NO CP installed)

Double Walled Tank

New Installations

- If possible:

  Tanks should be sloped very slightly towards Interstice riser.

- Why?
  - Faster detection of leak.
  - Easier removal of water.
  - To ensure interstice is dry.
    - Water NOT removed will cause corrosion. (No CP installed) (Not applicable to FRP tanks)
    - Can cause some issues with detecting leak using some Tank Tightness Test methods

Evaluation of Cathodic Protection Systems

- You are required to be licensed as MDEQ CP tester by 8/23/2020 if you:
  - Plan on testing CP in MS
  - Are not a corrosion expert.
  - STI, NACE, Petcon, ALPEC, GTEC approved courses

- Review: MDEQ guidelines for evaluation of UST CP systems link below:

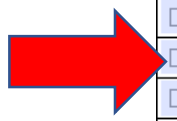
https://www.mdeq.ms.gov/wp-content/uploads/2017/06/cppolicy7-1-02.pdf

Galvanic (Sacrificial anode) CP form

3 ways to pass

- If anodes can / can not be disconnected:
  1. 850 mV ON
     - Both local and Remote must be > 850 mV
- If all anodes can be disconnected:
  2. 850 mV OFF
     - Local only. (Similar to IC system)
  3. 100 mV polarization below 850 mV OFF Local reading

- Repair Needed:
  - Means the CP survey does pass but other issues exist, such as:
    - Water in sumps in contact with flex connector
    - Boots around flex connectors cracked
    - Flex connector continuous with electrical conduit



STATE OF MISSISSIPPI
GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM EVALUATION

- This form must be utilized to evaluate underground storage tank (UST) cathodic protection systems in the State of Mississippi.
- Access to the soil directly over the cathodically protected structure that is being evaluated must be provided.
- A site drawing depicting the UST cathodic protection system and all reference electrode placements must be completed.

I. UST OWNER

NAME:
ADDRESS:
CITY: STATE:

II. UST FACILITY

NAME: ID #:
ADDRESS:
CITY: COUNTY:

III. CP TESTER

TESTER'S NAME:
COMPANY NAME:
ADDRESS:
CITY: STATE:

IV. CP TESTER'S QUALIFICATIONS

NACE INTERNATIONAL CERTIFICATION NUMBER:
MDEQ CERTIFICATION NUMBER:
OTHER (EXPLAIN):

V. REASON SURVEY WAS CONDUCTED (mark only one)

☐ Routine - 3 year ☐ Within 6 months of installation ☐ Re-survey after repair/modification ☐ Other (specify):

VI. CATHODIC PROTECTION TESTER'S EVALUATION (mark only one)

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (complete Section IX).
☐ INCONSLUSIVE	If the remote and the local do not both indicate the same test result on all protected structures (both pass or both fail), inconclusive is indicated and the survey must be evaluated and/or conducted by a corrosion expert (complete Section VII).

CP TESTER'S SIGNATURE: DATE CP SURVEY PERFORMED:

VII. CORROSION EXPERT'S EVALUATION (mark only one)

The survey must be conducted and/or evaluated by a corrosion expert when: a) an inconclusive is indicated for any protected structure since both the local and the remote structure-to-soil potentials do not result in the same outcome (both pass or both fail); b) repairs to galvanized or uncoated steel piping are conducted or c) supplemental anodes are added to the tanks and/or piping without following an accepted industry code.

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (indicate what action is necessary by completion of Section IX).

CORROSION EXPERT'S NAME: COMPANY NAME:
NACE INTERNATIONAL CERTIFICATION: NACE INTERNATIONAL CERTIFICATION NUMBER:
CORROSION EXPERT'S SIGNATURE: DATE:

VIII. CRITERIA APPLICABLE TO EVALUATION (mark all that apply)

☐ 850 ON	Structure-to-soil potential more negative than -850 mV with respect to a $Cu/CuSO_4$ reference electrode with the protective current applied (This criterion is applicable to any galvanically protected structure).
☐ 850 OFF	Structure-to-soil potential more negative than -850 mV with respect to a $Cu/CuSO_4$ reference electrode with protective current temporarily interrupted (This criterion is applicable only to those galvanic systems where the anodes can be disconnected).
☐ 100 mV POLARIZATION	Structure tested exhibits at least 100 mV of cathodic polarization (This criterion is applicable to galvanic systems where the anodes can be temporarily disconnected).

IX. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (mark only one)

☐ REPAIR & RETEST	Cathodic protection is not adequate. Repair as soon as practical but within the next 90 days and retest.
☐ Repair Needed	Cathodic protection is adequate and passes, however there are boots or sumps present that do NOT adequately protect the piping termination from corrosion. Repair as soon as practical but within the next 90 days.
☐ NONE	Cathodic protection is adequate. No further action is necessary at this time.

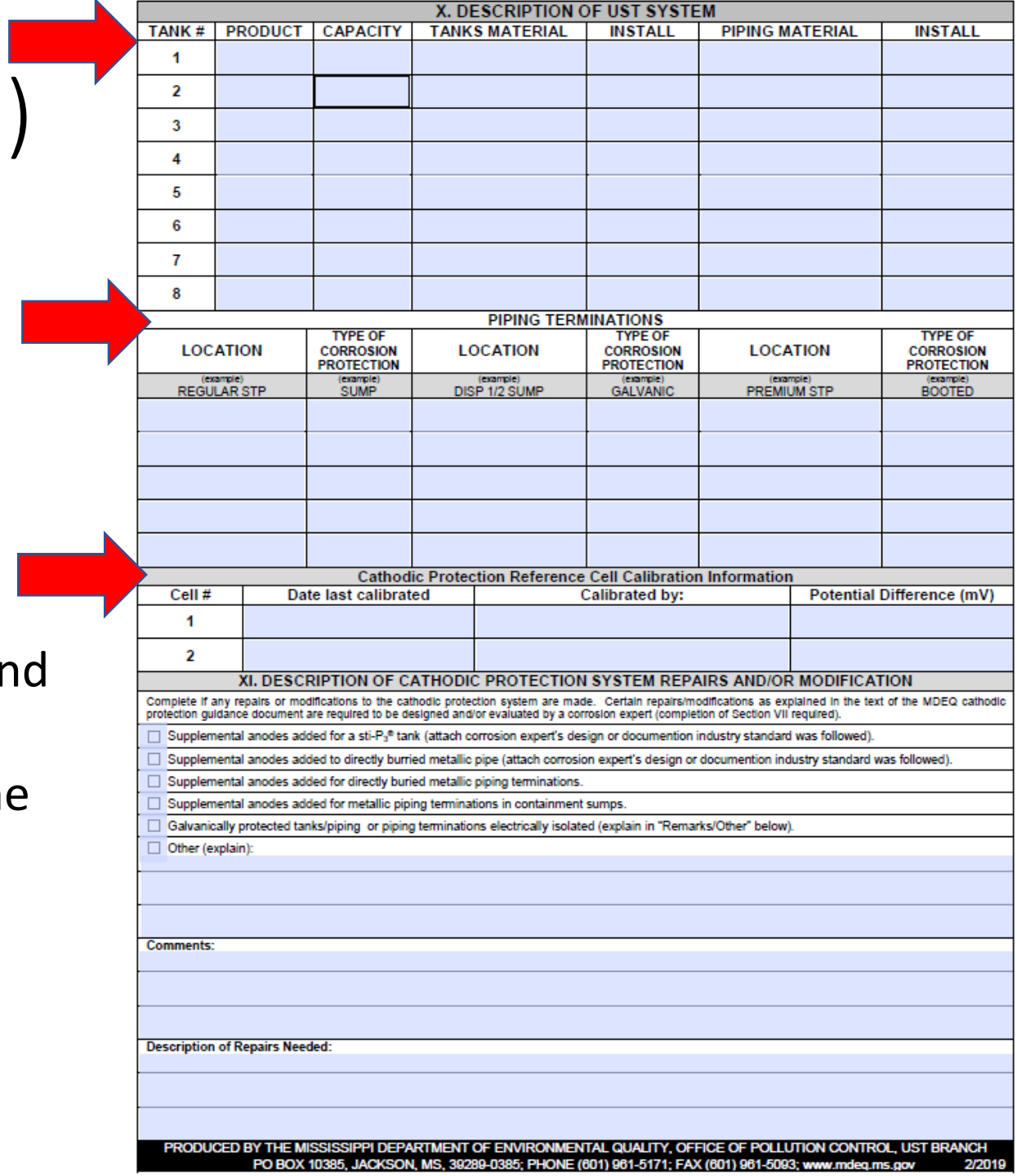
The next "routine" cathodic protection survey must be conducted by _____ (every 3 years thereafter).

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 10385, JACKSON, MS, 39289-0385; PHONE (601) 961-5171; FAX (601) 961-5093; www.mdeq.ms.gov 2/2019

Galvanic (Sacrificial anode) CP form

- Description of UST system
  - Get info from DEQ database

    (slides at end of class)
- Pipe terminations
  - You should inspect each pipe termination and list what it's using
  - You can group pipe terminations at the same location. (Ex. Disp ½ all booted or sump)



X. DESCRIPTION OF UST SYSTEM

TANK #	PRODUCT	CAPACITY	TANKS MATERIAL	INSTALL	PIPING MATERIAL	INSTALL
1						
2						
3						
4						
5						
6						
7						
8						

PIPING TERMINATIONS

LOCATION	TYPE OF CORROSION PROTECTION	LOCATION	TYPE OF CORROSION PROTECTION	LOCATION	TYPE OF CORROSION PROTECTION
(example) REGULAR STP	(example) SUMP	(example) DISP 1/2 SUMP	(example) GALVANIC	(example) PREMIUM STP	(example) BOOTED

Cathodic Protection Reference Cell Calibration Information

Cell #	Date last calibrated	Calibrated by:	Potential Difference (mV)
1			
2			

XI. DESCRIPTION OF CATHODIC PROTECTION SYSTEM REPAIRS AND/OR MODIFICATION

Complete if any repairs or modifications to the cathodic protection system are made. Certain repairs/modifications as explained in the text of the MDEQ cathodic protection guidance document are required to be designed and/or evaluated by a corrosion expert (completion of Section VII required).

- ☐ Supplemental anodes added for a sti-P$_3$® tank (attach corrosion expert's design or documention industry standard was followed).
- ☐ Supplemental anodes added to directly burried metallic pipe (attach corrosion expert's design or documention industry standard was followed).
- ☐ Supplemental anodes added for directly buried metallic piping terminations.
- ☐ Supplemental anodes added for metallic piping terminations in containment sumps.
- ☐ Galvanically protected tanks/piping or piping terminations electrically isolated (explain in "Remarks/Other" below).
- ☐ Other (explain):

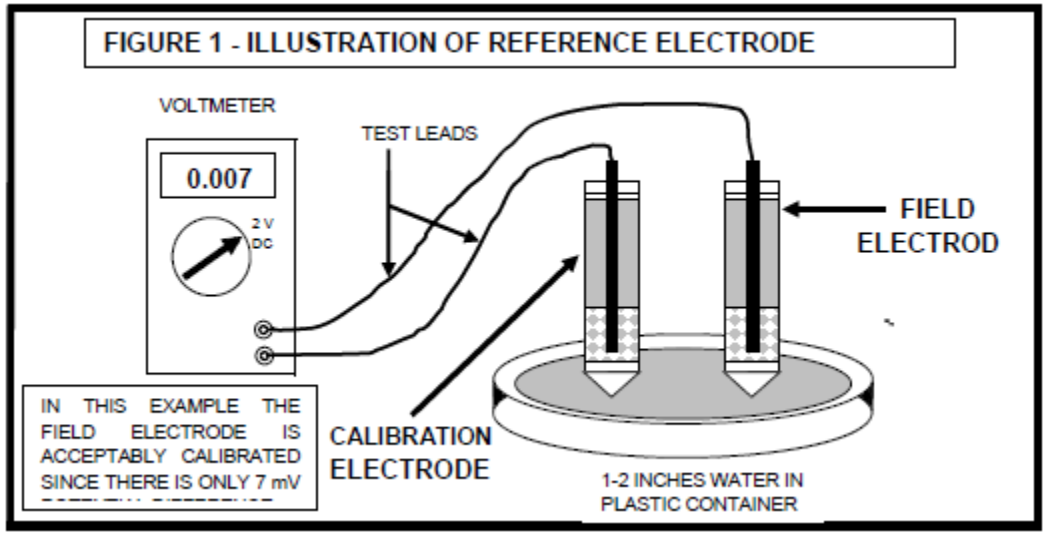
Comments:

Description of Repairs Needed:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 10385, JACKSON, MS, 39289-0385; PHONE (601) 961-5171; FAX (601) 961-5093; www.mdeq.ms.gov 2/2019

Reference cell calibration

- Reference cell calibration:
  - You should have a virgin cell
    (not used for testing or recently remixed)
  - Place tips of both test cell and virgin cell in tap water. Connect volt meter. Record difference.
  - < 10 mV difference your test cell is good.
  - Recalibration depends on how often you test CP.



Galvanic (Sacrificial anode) CP form

- All structures tested should be isolated.
- Structure may fail Continuity survey but may pass CP survey
  - Repair needed. Pg. 1
  - Structure still passes CP survey

XIII. GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM CONTINUITY SURVEY

- This section may be utilized to conduct measurements of continuity on underground storage tank systems that are protected by cathodic protection systems.
- When conducting a fixed cell - moving ground survey, the reference electrode must be placed in the soil at a remote location and left undisturbed.
- Conduct point-to-point test between any two structures for which the fixed cell-moving ground survey is inconclusive or indicates possible continuity.
- For galvanic systems, the structure that is to be protected must be isolated from any other metallic structure in order to pass the continuity survey.

FACILITY ID NUMBER:

NOTE: The survey is not complete unless all applicable parts of Sections I - XIV are also completed

DESCRIBE LOCATION OF "FIXED REMOTE" REFERENCE ELECTRODE PLACEMENT:

STRUCTURES TESTED		POINT – TO – POINT TEST METHOD	FIXED CELL – MOVING GROUND TEST METHOD			TEST RESULTS	
STRUCTURE "A"[1]	STRUCTURE "B"[2]	POINT-TO-POINT VOLTAGE DIFFERENCE[3]	STRUCTURE "A" FIXED REMOTE VOLTAGE[4]	STRUCTURE "B" FIXED REMOTE VOLTAGE[5]	STRUCTURE "A" / STRUCTURE "B" VOLTAGE DIFFERENCE[6]	ISOLATED / CONTINUOUS / INCONCLUSIVE[7]	PASS / FAIL[8]
(example) PREMIUM TANK BOTTOM	(example) PREMIUM FILL RISER		(example) -921 mV	(example) -915 mV	(example) 6 mV	(example) CONTINUOUS	FAIL
(example) PREMIUM TANK BOTTOM	(example) PREMIUM FILL RISER	(example) 17 mV				(example) ISOLATED	PASS

Galvanic (Sacrificial anode) CP form

Establishing Remote earth – New to galvanic form

Where your remote cell is located matters.

This should be done prior to testing continuity if using fixed cell – moving ground method.

- Use same structure (Ex. Reg tank bottom)
- Take remote reading (Ex. 850 mV)
- Move remote minimum 10 ft away.
- Take 2nd remote reading (Ex. 856 mV)
- Difference should be 6 mV or less
  - If it is NOT your remote location is influenced by stray current / raised earth. Try again.
  - If it is 6 mV or less,
    - Pick which remote location you want to use.
    - Move cell back to that spot and begin CP test.

XIV. GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM SURVEY

- This section may be utilized to conduct a survey of a galvanic cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly over the tested structure (local) and 25-100 feet away from the structure (remote).
- The local and remote voltage (s) must be -850 mV or more negative; OR meet the 100 mV polarization criterion in order to pass.
- Inconclusive is indicated when both the local and the remote structure-to-soil potentials do not result in the same outcome (both pass or both fail).

FACILITY ID NUMBER:	NOTE: The survey is not complete unless all applicable parts of Sections I - XIV are also completed		
Establishment of Remote Earth	**Test Location**	**Remote Voltage**	**Remote used for CP Survey**
DESCRIBE LOCATION OF REMOTE REFERENCE ELECTRODE PLACEMENT #1 (R1):	(Ex. Regular Tank Bottom)	(Ex. -850 mV)	☐ Yes ☐ No
DESCRIBE LOCATION OF REMOTE REFERENCE ELECTRODE PLACEMENT #2 (R2):	(Ex. Regular Tank Bottom)	(Ex. -856 mV)	☐ Yes ☐ No
* Remote Earth must be established to ensure an accurate remote reading. See MDEQ CP policy for more information.	Difference =	(Ex. 6 mV)	Note: All measurements recorded in mV unless noted.

STRUCTURE OR CONTACT POINT[2]	LOCAL REFERENCE CELL PLACEMENT[3]	LOCAL / ON VOLTAGE[4]	REMOTE VOLTAGE[4]	100 mV POLARIZATION				PASS/ FAIL/ INCONCLUSIVE[8]
				INSTANT OFF VOLTAGE[5]	ENDING VOLTAGE[5]	VOLTAGE SHIFT[5]	ELAPSED TIME[5]	
(example) PLUS TANK BOTTOM	(example) PLUS TANK STP MANWAY	(example) -928	(example) -810					(example) INCONCLUSIVE
(example) DIESEL STP PIPE TERM	(example) WATER STP SUMP	(example) -879		(example) -725	(example) -428	(example) 297	(example) 10 min	(example) PASS

Galvanic (Sacrificial anode) CP form

100 mV Polarization– New to galvanic form

If local & remote not 850 mV or greater you can use this section to pass structure.

Only applies to structures where all anodes can be disconnected at the same time.

- Local “On voltage” has to be 850 or greater.
- Quickly disconnect and reconnect wire.
  - If “Instant Off voltage” is:
    - 850 mV or higher it passes.
    - less than 850 mV you can use 100 mV polarization.
      - Disconnect wire again.
      - Reading should drop 100 mV below “Instant Off voltage”
      - Record time it took to depolarize 100 mV
- This primarily should be used for anodes in sumps but the theory applies to all galvanic CP.

XIV. GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM SURVEY

- This section may be utilized to conduct a survey of a galvanic cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly over the tested structure (local) and 25-100 feet away from the structure (remote).
- The local and remote voltage (s) must be -850 mV or more negative; OR meet the 100 mV polarization criterion in order to pass.
- Inconclusive is indicated when both the local and the remote structure-to-soil potentials do not result in the same outcome (both pass or both fail).

FACILITY ID NUMBER:

NOTE: The survey is not complete unless all applicable parts of Sections I - XIV are also completed

Establishment of Remote Earth	Test Location	mote Voltage	Remote used for CP Survey
DESCRIBE LOCATION OF REMOTE REFERENCE ELECTRODE PLACEMENT #1 (R1):	(Ex. Regular Tank Bottom)	50 mV)	☐ Yes ☐ No
DESCRIBE LOCATION OF REMOTE REFERENCE ELECTRODE PLACEMENT #2 (R2):	(Ex. Regular Tank Bottom)	56 mV)	☐ Yes ☐ No
* Remote Earth must be established to ensure an accurate remote reading. See MDEQ CP policy for more information.	Difference =	V)	Note: All measurements recorded in mV unless noted.

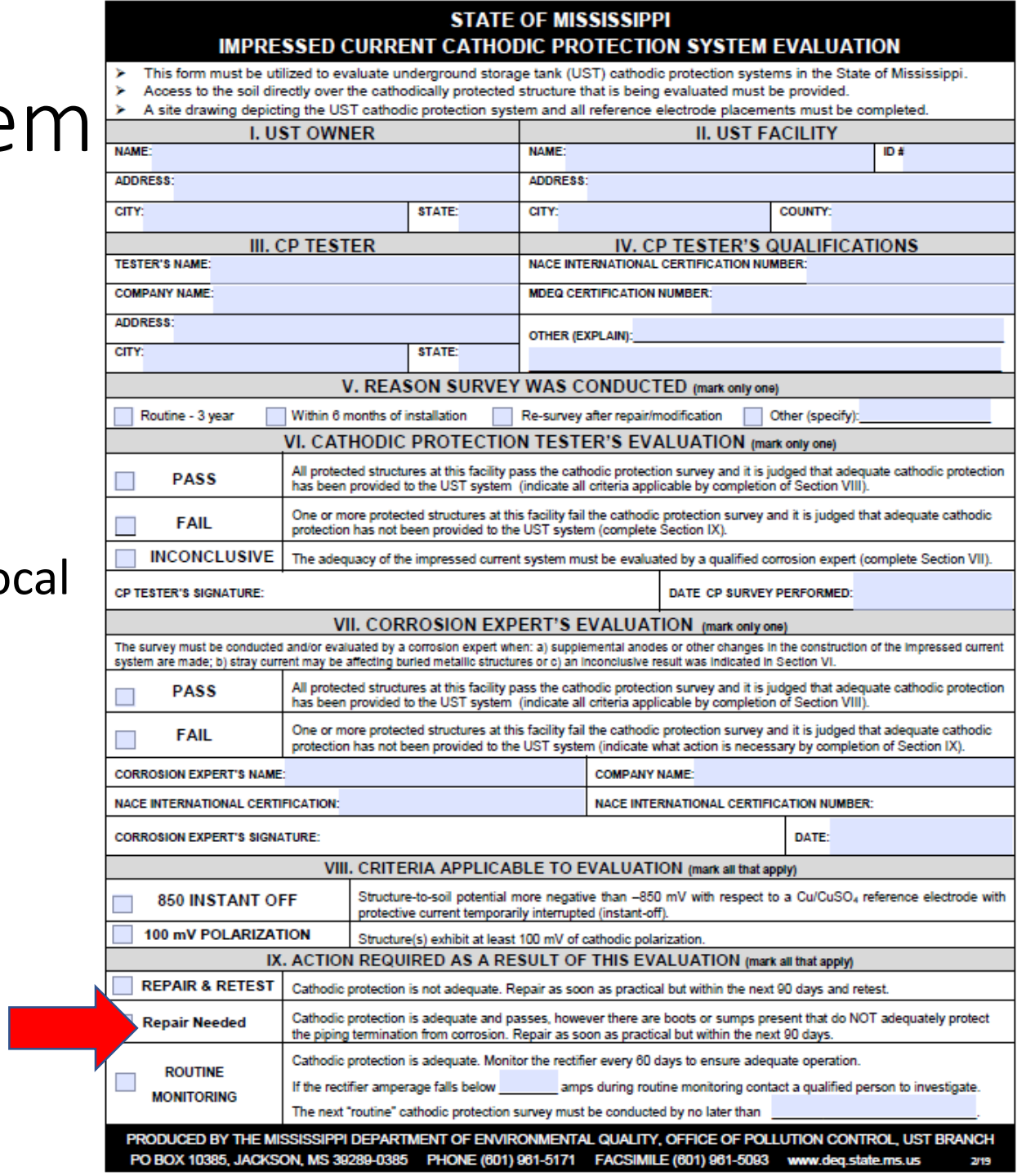
STRUCTURE OR CONTACT POINT[2]	LOCAL REFERENCE CELL PLACEMENT[3]	LOCAL / ON VOLTAGE[4]	REMOTE VOLTAGE[4]	100 mV POLARIZATION				PASS/ FAIL/ INCONCLUSIVE[8]
				INSTANT OFF VOLTAGE[5]	ENDING VOLTAGE[5]	VOLTAGE SHIFT[5]	ELAPSED TIME[5]	
(example) PLUS TANK BOTTOM	(example) PLUS TANK STP MANWAY	(example) -928	(example) -810					(example) INCONCLUSIVE
(example) DIESEL STP PIPE TERM	(example) WATER STP SUMP	(example) -879		(example) -725	(example) -428	(example) 297	(example) 10 min	(example) PASS

Impressed Current System CP Form

2 ways to pass

- Instant OFF voltage:
  1. 850 mV OFF or greater
  2. 100 mV polarization below 850 mV OFF Local reading

- Repair Needed:
  - Means the CP survey does pass but other issues exist, such as:
    - Water in sumps in contact with flex connector
    - Boots around flex connectors cracked
    - Continuity issues.



STATE OF MISSISSIPPI
IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM EVALUATION

- This form must be utilized to evaluate underground storage tank (UST) cathodic protection systems in the State of Mississippi.
- Access to the soil directly over the cathodically protected structure that is being evaluated must be provided.
- A site drawing depicting the UST cathodic protection system and all reference electrode placements must be completed.

I. UST OWNER

NAME: | ADDRESS: | CITY: | STATE:

II. UST FACILITY

NAME: | ID # | ADDRESS: | CITY: | COUNTY:

III. CP TESTER

TESTER'S NAME: | COMPANY NAME: | ADDRESS: | CITY: | STATE:

IV. CP TESTER'S QUALIFICATIONS

NACE INTERNATIONAL CERTIFICATION NUMBER: | MDEQ CERTIFICATION NUMBER: | OTHER (EXPLAIN):

V. REASON SURVEY WAS CONDUCTED (mark only one)

☐ Routine - 3 year ☐ Within 6 months of installation ☐ Re-survey after repair/modification ☐ Other (specify):

VI. CATHODIC PROTECTION TESTER'S EVALUATION (mark only one)

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (complete Section IX).
☐ INCONCLUSIVE	The adequacy of the impressed current system must be evaluated by a qualified corrosion expert (complete Section VII).

CP TESTER'S SIGNATURE: | DATE CP SURVEY PERFORMED:

VII. CORROSION EXPERT'S EVALUATION (mark only one)

The survey must be conducted and/or evaluated by a corrosion expert when: a) supplemental anodes or other changes in the construction of the impressed current system are made; b) stray current may be affecting buried metallic structures or c) an inconclusive result was indicated in Section VI.

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (indicate what action is necessary by completion of Section IX).

CORROSION EXPERT'S NAME: | COMPANY NAME:

NACE INTERNATIONAL CERTIFICATION: | NACE INTERNATIONAL CERTIFICATION NUMBER:

CORROSION EXPERT'S SIGNATURE: | DATE:

VIII. CRITERIA APPLICABLE TO EVALUATION (mark all that apply)

☐ 850 INSTANT OFF	Structure-to-soil potential more negative than –850 mV with respect to a $Cu/CuSO_4$ reference electrode with protective current temporarily interrupted (instant-off).
☐ 100 mV POLARIZATION	Structure(s) exhibit at least 100 mV of cathodic polarization.

IX. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (mark all that apply)

☐ REPAIR & RETEST	Cathodic protection is not adequate. Repair as soon as practical but within the next 90 days and retest.
☐ Repair Needed	Cathodic protection is adequate and passes, however there are boots or sumps present that do NOT adequately protect the piping termination from corrosion. Repair as soon as practical but within the next 90 days.
☐ ROUTINE MONITORING	Cathodic protection is adequate. Monitor the rectifier every 60 days to ensure adequate operation. If the rectifier amperage falls below _____ amps during routine monitoring contact a qualified person to investigate. The next "routine" cathodic protection survey must be conducted by no later than _____.

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 10385, JACKSON, MS 39289-0385 PHONE (601) 961-5171 FACSIMILE (601) 961-5093 www.deq.state.ms.us 2/19

Impressed Current System CP Form

- Pg. 2 same as galvanic form:
  - Description of system
  - Piping terminations
  - Reference cell calibration

The difference: For pipe terminations using IC system you should complete “Continuity survey” before answering this.

This is critical step.

X. DESCRIPTION OF UST SYSTEM

TANK #	PRODUCT	CAPACITY	TANKS MATERIAL	INSTALL	PIPING MATERIAL	INSTALL
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

PIPING TERMINATIONS

LOCATION	TYPE OF CORROSION PROTECTION	LOCATION	TYPE OF CORROSION PROTECTION	LOCATION	TYPE OF CORROSION PROTECTION
(example) REGULAR STP SUMP	(example) GALVANIC	(example) DISP 1/2	(example) BOOTED	(example) PREMIUM STP	(example) I.C. SYSTEM

Cathodic Protection Reference Cell Calibration Information

Cell #	Date last calibrated	Calibrated by	Potential Difference (mV)
1			
2			
3			

Additional Description of UST System

Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 10385, JACKSON, MS 39289-0385 PHONE (601) 961-5171 FACSIMILE (601) 961-5093 www.deq.state.ms.us 2/19

Impressed Current System CP Form

- Rectifier Data:
  - Measured – means what your volt meter says when connected.
  - Indicated – means what gauge on rectifier says.
    - If not what you “measured” you should adjust and or replace the gauge on rectifier.
- Shunt Calculation:

$$\frac{0.2 \text{ Amps}}{1 \text{ mV}} = \frac{0.2 \text{ Amps}}{\text{mV}}$$

- Measured Amps:

You measure 14 mV across (-) shunt

$$14 \text{ mV} \times \frac{0.2 \text{ Amps}}{\text{mV}} = 2.8 \text{ Amps}$$

XI. IMPRESSED CURRENT RECTIFIER DATA (complete all applicable)

In order to conduct an effective evaluation of the cathodic protection system, a complete evaluation of rectifier operation is necessary.

RECTIFIER MANUFACTURER: | RATED DC OUTPUT: ____ VOLTS ____ AMPS

RECTIFIER MODEL: | RECTIFIER SERIAL NUMBER:

RECTIVIER SHUNT: 1 mV = 0.2 Amps | SHUNT FACTOR = 0.2 Amps / mV

	TAP SETTINGS OR RHEOSTAT %			DC OUTPUT				HOUR METER
	COARSE	FINE	RHEOSTAT	INDICATED VOLTS	INDICATED AMPS	MEASURED VOLTS	MEASURED AMPS	
"AS FOUND"							____ (Shunt Voltage = ____)	

"AS FOUND"	POSITIVE AND NEGATIVE CIRCUIT MEASUREMENTS (Amps)										Anode Shunt Size =			0.01 Ω
	CIRCUIT	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	ANODE (+)													Amps
	STRUCTURE (-)													Amps

☐ Mark this box if rectifier was not changed from the “AS FOUND” settings.

	TAP SETTINGS OR RHEOSTAT %			DC OUTPUT				HOUR METER
	COARSE	FINE	RHEOSTAT	INDICATED VOLTS	INDICATED AMPS	MEASURED VOLTS	MEASURED AMPS	
"AS LEFT"							2.8 amps (Shunt Voltage = 14 mV)	

"AS LEFT"	POSITIVE AND NEGATIVE CIRCUIT MEASUREMENTS (Amps)										Anode Shunt Size =			0.01 Ω
	CIRCUIT	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	ANODE (+)													Amps
	STRUCTURE (-)													Amps

XII. DESCRIPTION OF CATHODIC PROTECTION SYSTEM REPAIRS AND/OR MODIFICATION

Impressed Current System CP Form

- If you have a Junction box:
- Record mV across the shunts:

  Ex. Measured 2.4 mV across shunt
  move decimal place
  0.24 amps

- Your total amps should equal your measured amps at rectifier shunt.

XI. IMPRESSED CURRENT RECTIFIER DATA (complete all applicable)

In order to conduct an effective evaluation of the cathodic protection system, a complete evaluation of rectifier operation is necessary.

RECTIFIER MANUFACTURER: | RATED DC OUTPUT: ____ VOLTS ____ AMPS

RECTIFIER MODEL: | RECTIFIER SERIAL NUMBER:

RECTIVIER SHUNT: 1 mV = 0.2 Amps | SHUNT FACTOR = 0.2 Amps / mV

"AS FOUND"

TAP SETTINGS OR RHEOSTAT %			DC OUTPUT				HOUR METER
COARSE	FINE	RHEOSTAT	INDICATED VOLTS	INDICATED AMPS	MEASURED VOLTS	MEASURED AMPS	
						2.8 amps (Shunt Voltage = 14 mV)	

POSITIVE AND NEGATIVE CIRCUIT MEASUREMENTS (Amps)										Anode Shunt Size =			0.01 Ω
CIRCUIT	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
ANODE (+)													Amps
STRUCTURE (-)	0.24	1.13	1.00	0.27	0.23								2.87 Amps

☐ Mark this box if rectifier was not changed from the "AS FOUND" settings.

"AS LEFT"

TAP SETTINGS OR RHEOSTAT %			DC OUTPUT				HOUR METER
COARSE	FINE	RHEOSTAT	INDICATED VOLTS	INDICATED AMPS	MEASURED VOLTS	MEASURED AMPS	
						(Shunt Voltage =)	

POSITIVE AND NEGATIVE CIRCUIT MEASUREMENTS (Amps)										Anode Shunt Size =			0.01 Ω
CIRCUIT	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
ANODE (+)													Amps
STRUCTURE (-)													Amps

Impressed Current System CP Form

- All structures protected by IC system must be:
  - continuous to rectifier (-) terminal. (6 mV or less)
  - Documented in this section
- IC system readings can fool you.
  - Structures can have good CP readings on it, and not be tied into the rectifier
  - Continuity reading may be 48 mV and still be continuous.
    - Run temporary ground wire between rectifier (-) and structure. Recheck continuity. Is it still reading 48 mV?
      - If so it is continuous.
      - Make a note of what you did to prove it.

XIV. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM CONTINUITY SURVEY

- This section may be utilized to conduct measurements of continuity on underground storage tank systems that are protected by cathodic protection systems.
- When conducting a fixed cell - moving ground survey, the reference electrode must be placed in the soil at a remote location and left undisturbed.
- Conduct point-to-point test between any two structures for which the fixed cell - moving ground survey is inconclusive or indicates possible isolation.
- For impressed current systems, the protected structure must be continuous with all other protected structures in order to pass the continuity survey.

FACILITY ID NUMBER:

NOTE: The survey is not complete unless all applicable parts of Sections I-XIV are also completed

DESCRIBE LOCATION OF "FIXED REMOTE" REFERENCE ELECTRODE PLACEMENT:

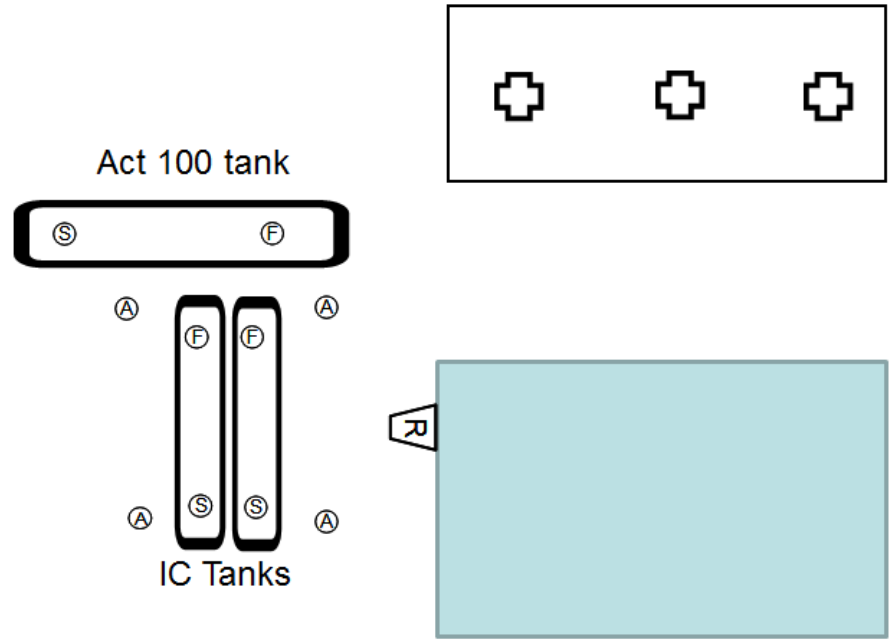
STRUCTURES TESTED		POINT – TO – POINT TEST METHOD	FIXED CELL – MOVING GROUND TEST METHOD			TEST RESULTS	
STRUCTURE "A" [1]	STRUCTURE "B" [2]	POINT-TO-POINT VOLTAGE DIFFERENCE [3]	STRUCTURE "A" FIXED REMOTE VOLTAGE [4]	STRUCTURE "B" FIXED REMOTE VOLTAGE [5]	STRUCTURE "A" / [6] STRUCTURE "B" VOLTAGE DIFFERENCE	ISOLATED / CONTINUOUS / INCONCLUSIVE [7]	PASS / FAIL [8]
(example) PLUS TANK BOTTOM	(example) PLUS PIPING AT STP		(example) -915 mV	(example) -908 mV	(example) 7 mV	(example) INCONCLUSIVE	FAIL
(example) RECTIFIER NEGATIVE	(example) PLUS TANK BOTTOM	(example) 1 mV				(example) CONTINUOUS	PASS

- What happens when any metal structure receives current but can't return it back to rectifier (-)?
  - Accelerated Corrosion

Impressed Current System CP Form

Stray Current

- Common Situations:
  - Coated tank installed near IC system
  - Dispenser pipe terminations near IC system
    May have galvanic CP, or boots installed?
    But, it may need to be IC system?
  - STIp3 tank, STP pipe termination NOT tied into IC system



- Use continuity 1st to tell what is what.
- For structures NOT tied into IC system.
  - With “Local” reference cell, volt meter setup, cycle the Rectifier ON / OFF. Do you notice a change in mV?
  - If so, that is stray current.
  - Can affect all examples above.
  - Not all Stray Current needs to be addressed. Talk to your corrosion expert.

Impressed Current System CP Form

2 ways to pass

- Instant OFF voltage:
  1. 850 mV OFF or greater
  2. 100 mV polarization below 850 mV OFF Local reading

NEW: You are required to use 3 test points over top of the tank.

- Why?

XV. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM SURVEY

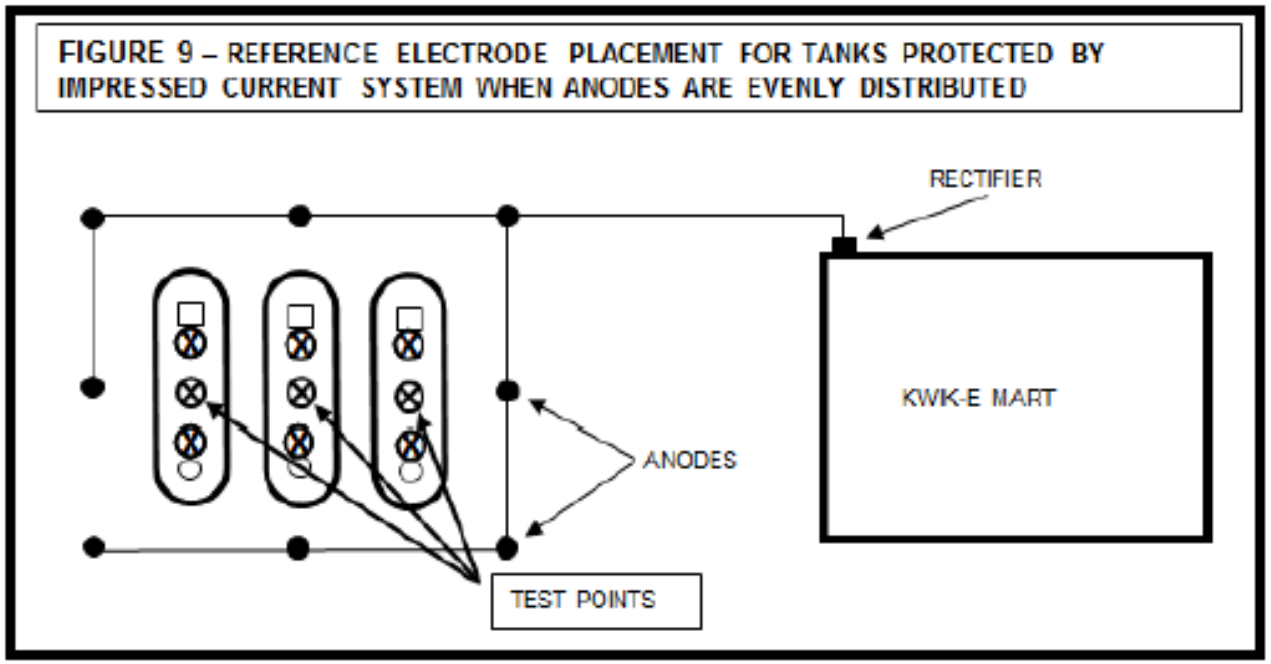
- This section may be utilized to conduct a survey of an impressed current cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly above the structure that is being tested and as far away from any active anode as practical to obtain a valid structure-to-soil potential (refer to the MDEQ cathodic protection evaluation guidance document for detailed discussion of electrode placement).
- Both on and instant off potentials must be measured for each structure that is intended to be under cathodic protection.
- Three on and instant off potentials must be measured for each tank that is intended to be under cathodic protection.
- The instant off potential must be -850 mV or more negative or the 100 mV polarization criterion must be satisfied in order to pass.

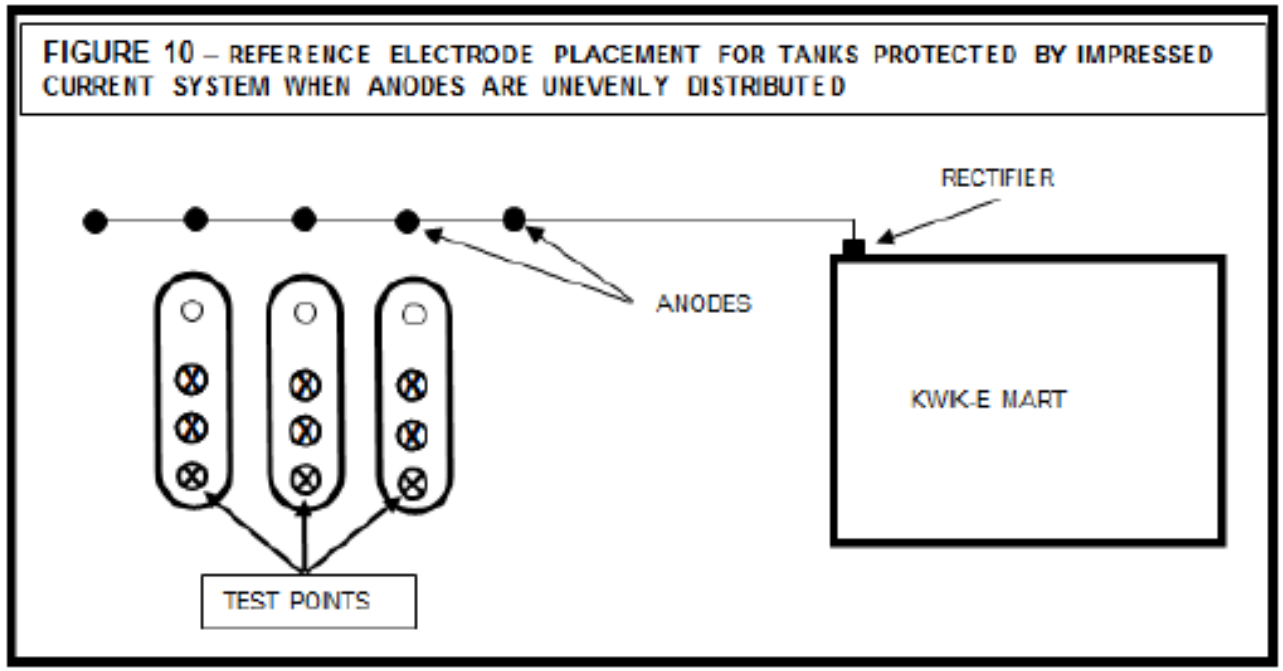
FACILITY ID NUMBER:

NOTE: This survey is not complete unless all applicable parts of sections I – XIV are also completed

STRUCTURE OR CONTACT POINT [2]	LOCATION OF LOCAL REFERENCE CELL PLACEMENT [3]	ON [4] VOLTAGE	INSTANT [5] OFF VOLTAGE	100 mV POLARIZATION			PASS / FAIL / INCONCLUSIVE [7]
				ENDING [6] VOLTAGE	VOLTAGE [6] SHIFT	ELAPSED [6] TIME	
(example) PLUS TANK BOTTOM	(example) SOIL @ REG. STP	(example) -1070mV	(example) -875 mV				(example) PASS
(example) DIESEL PIPE DISPENSER 7/8	(example) SOIL @ Dispenser 7/8	(example) -854 mV	(example) -680 mV	(example) -575 mV	(example) 105 mV	(example) 24 hours	(example) PASS

Not all IC systems are equal
Current not distributed evenly.
Multiple anodes may have already failed.





Impressed Current System CP Form

100 mV polarization

- Galvanic anodes should NEVER be mixed with IC system
- They can significantly alter your 100 mV depolarization readings.
- MDEQ inspectors do watch for this.

- When rectifier turned off:
  - Readings should not rise above “Instant Off voltage”
  - They should not level off prior to reaching 100 mV.

<u>Example 100 mV depolarization</u>

- On Voltage -2400 mV
- Instant OFF voltage -825 mV
- Rectifier turned off:
  - 10 minutes pass -815 mV
  - 20 minutes pass -810 mV
  - 30 minutes pass -805 mV
  - 24 hours pass -790 mV
  - 7 days pass - 789 mV
- This system FAILS. (Did not drop 100mV)

825-789 = 36 mV drop

- 100 mV depolarization also applies to galvanic anodes. Same method.

100 mV Polarization
Is the key to proving CP

- Whether galvanic or IC system
- If system exhibits 100 mV decay from instant OFF reading it has proven itself.

- All anodes protecting the structure, whether galvanic or IC system must be turned off at the same time.
- Using the Min/Max feature on your volt meter can fool you.

- Proving the system will depolarize by 100 mV is the key.

60 Day Rectifier Log

- Minimum Design Amperage
- Look at last passing CP test
- Find total amps (-)

"AS FOUND"

TAP SETTINGS OR RHEOSTAT %			DC OUTPUT				HOUR METER
COARSE	FINE	RHEOSTAT	INDICATED VOLTS	INDICATED AMPS	MEASURED VOLTS	MEASURED AMPS	
2	4		N.A.	2.75	10.08	2.72 (Shunt Voltage = 13.6)	

POSITIVE AND NEGATIVE CIRCUIT MEASUREMENTS (Amps)										Anode Shunt Size =			0.01 Ω
CIRCUIT	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
ANODE (+)	0.45	0.56	0.47	0.65	0.68								2.81 Amps
STRUCTURE (-)													Amps

☐ Mark this box if rectifier was not changed from the "AS FOUND" settings.

- 2.72 * 0.8 = 2.2 amps
- Purpose is so the tank owner / monthly guy knows when to call.

STATE OF MISSISSIPPI
IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM
60-DAY RECORD OF RECTIFER OPERATION

- This form may be utilized to document that the cathodic protection system rectifier is checked for operation at least once every 60 days.
- Checked for operation is taken to mean that it was confirmed the rectifier was receiving power and is "turned-on".
- If your rectifier is so equipped, you should also record the output voltage, amperage and the number of hours indicated on the meter.
- The design corrosion engineer should specify the minimum amperage required to provide adequate cathodic protection.

UST OWNER		UST FACILITY	
NAME:		NAME:	ID #
ADDRESS:		ADDRESS:	
CITY:	STATE:	CITY:	COUNTY:

MINIMUM DESIGN AMPERAGE

The minimum amperage needed to provide adequate cathodic protection is: ____ amps

Contact a qualified person to investigate if the observed amperage falls below this value

Note: Relatively small variations in the rectifier amperage are normal. If there is no minimum amperage specified, contact a qualified person to investigate if the observed amperage varies by 20% or more from the last passing test amperage.

The last passing test was performed on: _____ with the system operating at _____ amps

IMPRESSED CURRENT RECTIFIER DATA

Rectifier Manufacturer:		Rated DC Output: _____ VOLTS _____ AMPS
Rectifier Model:		Rectifier Serial Number:

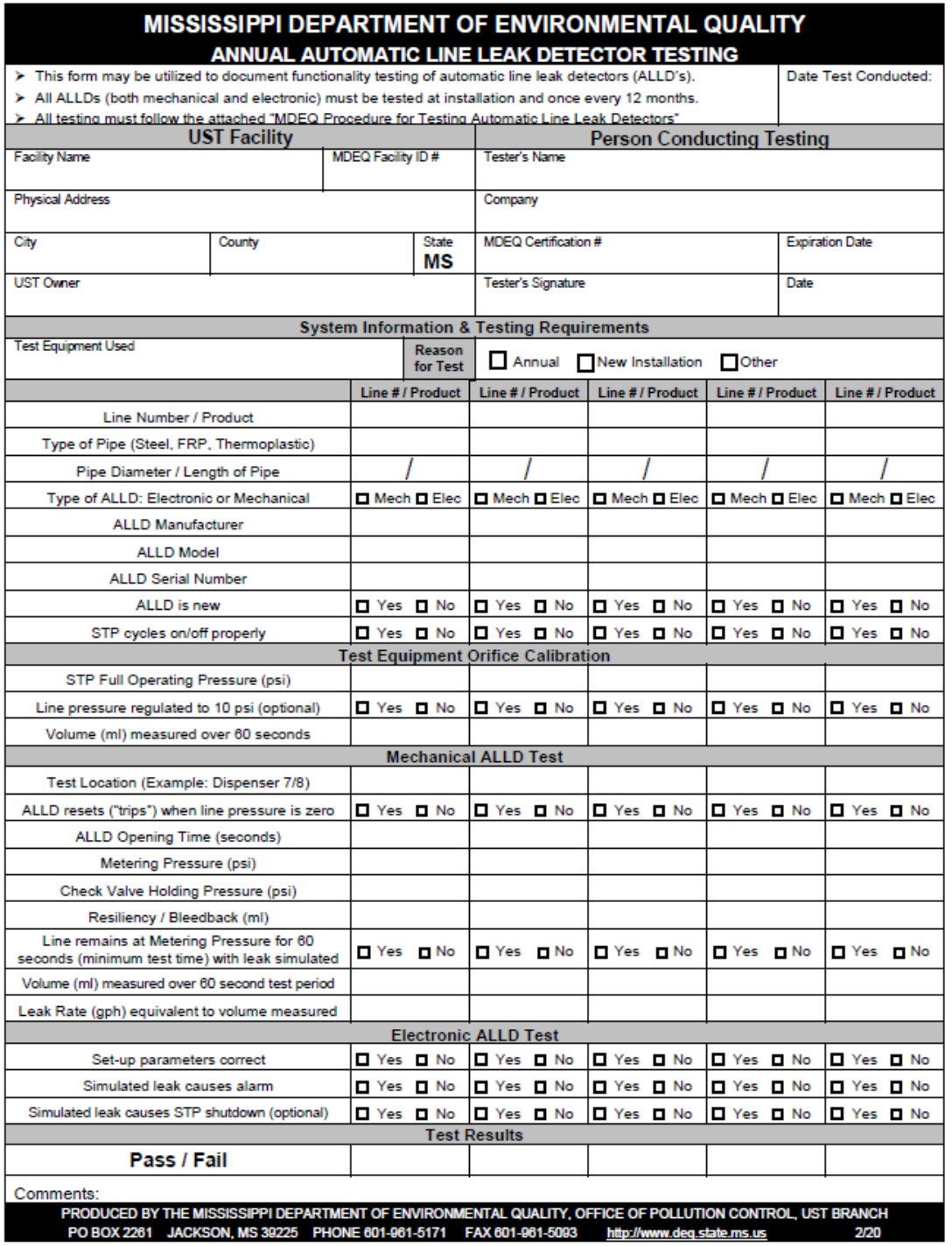
60-DAY LOG OF RECTIFIER OPERATION

DATE INSPECTED	RECTIFIER TURNED ON?	TAP SETTINGS		DC OUTPUT		HOUR METER	INSPECTOR INITIALS	COMMENTS
		COARSE	FINE	VOLTS	AMPS			

Annual LLD Test form

Proposed form

- We want your feedback… Think about it
- Why change?
  - Varying manufactures and test procedures
  - In general, what your trying to determine is the same.
  - Many misconceptions and misunderstandings about testing



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

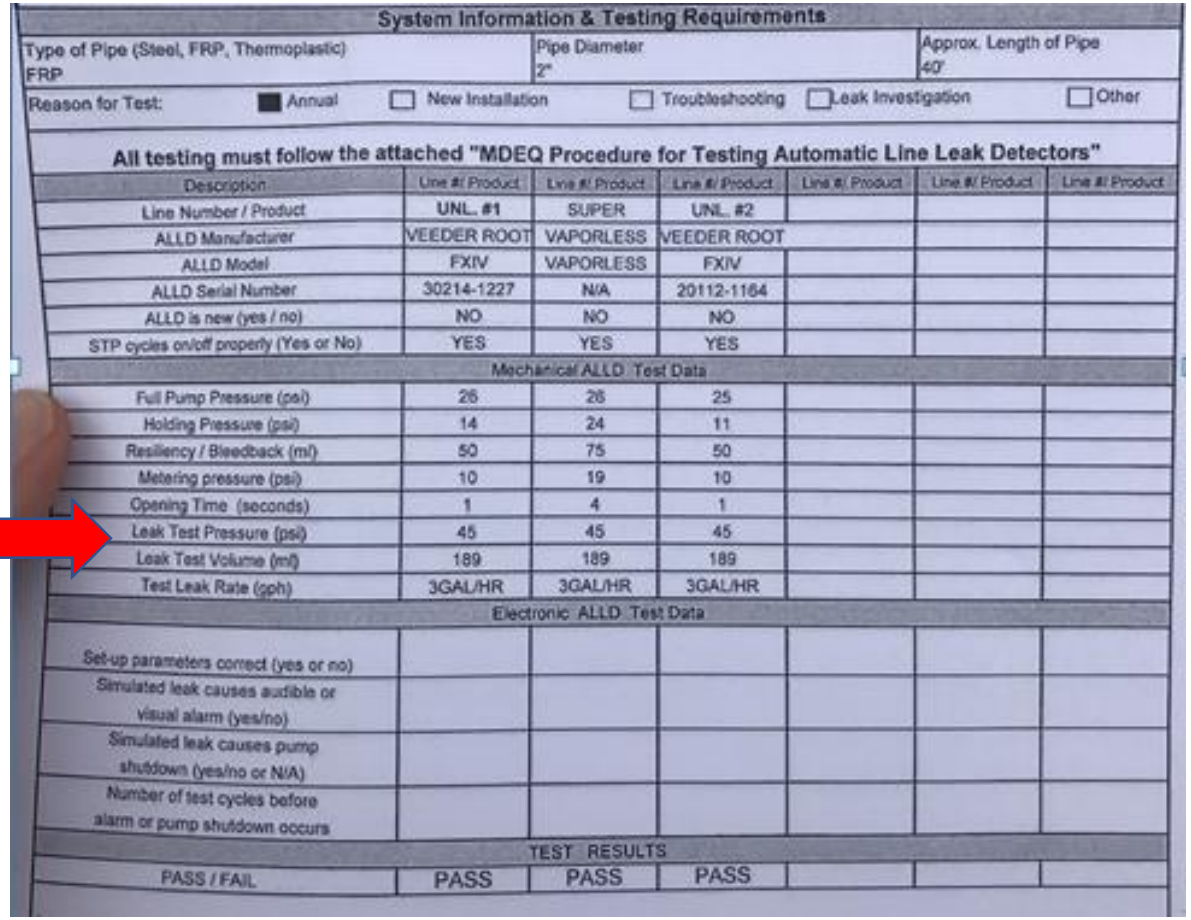
Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

Annual LLD Test form

Old MDEQ form

- Leak Test Pressure was meant to document “calibration”
- To confirm the hole size / leak rate used.
  - To confusing. Not clear.
- Need to hit the reset button.
- Clarify:
  - What matters for the test?
  - What do you have to do?
  - What is the goal?



System Information & Testing Requirements

Type of Pipe (Steel, FRP, Thermoplastic)	Pipe Diameter	Approx. Length of Pipe
FRP	2"	40'

Reason for Test: ■ Annual ☐ New Installation ☐ Troubleshooting ☐ Leak Investigation ☐ Other

All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Description	Line #/ Product	Line #/ Product	Line #/ Product	Line #/ Product	Line #/ Product	Line #/ Product
Line Number / Product	UNL. #1	SUPER	UNL. #2			
ALLD Manufacturer	VEEDER ROOT	VAPORLESS	VEEDER ROOT			
ALLD Model	FXIV	VAPORLESS	FXIV			
ALLD Serial Number	30214-1227	N/A	20112-1164			
ALLD is new (yes / no)	NO	NO	NO			
STP cycles on/off properly (Yes or No)	YES	YES	YES			
Mechanical ALLD Test Data						
Full Pump Pressure (psi)	26	26	25			
Holding Pressure (psi)	14	24	11			
Resiliency / Bleedback (ml)	50	75	50			
Metering pressure (psi)	10	19	10			
Opening Time (seconds)	1	4	1			
Leak Test Pressure (psi)	45	45	45			
Leak Test Volume (ml)	189	189	189			
Test Leak Rate (gph)	3GAL/HR	3GAL/HR	3GAL/HR			
Electronic ALLD Test Data						
Set-up parameters correct (yes or no)						
Simulated leak causes audible or visual alarm (yes/no)						
Simulated leak causes pump shutdown (yes/no or N/A)						
Number of test cycles before alarm or pump shutdown occurs						
TEST RESULTS						
PASS / FAIL	PASS	PASS	PASS			

Annual LLD Test form

Testing equipment

Petrotite

Vaporless

TSC 1000

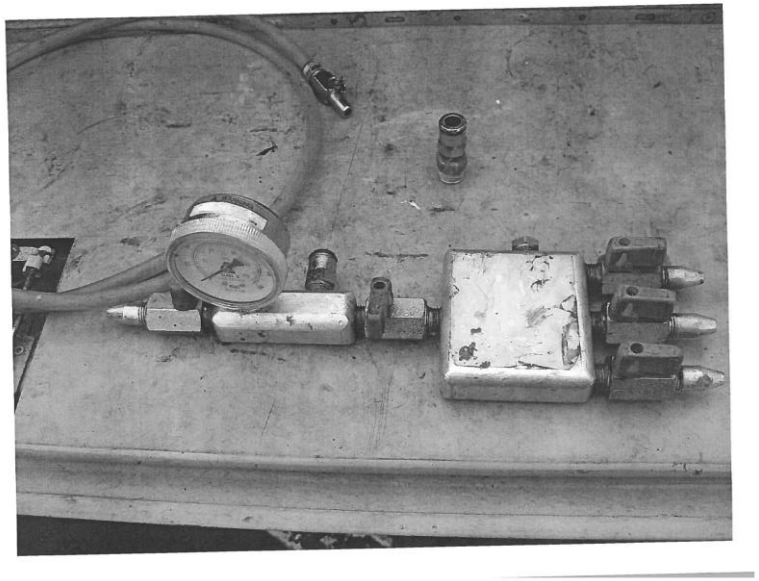
Annual LLD Test form

Testing equipment

Red Jacket

Red Jacket FX Tester

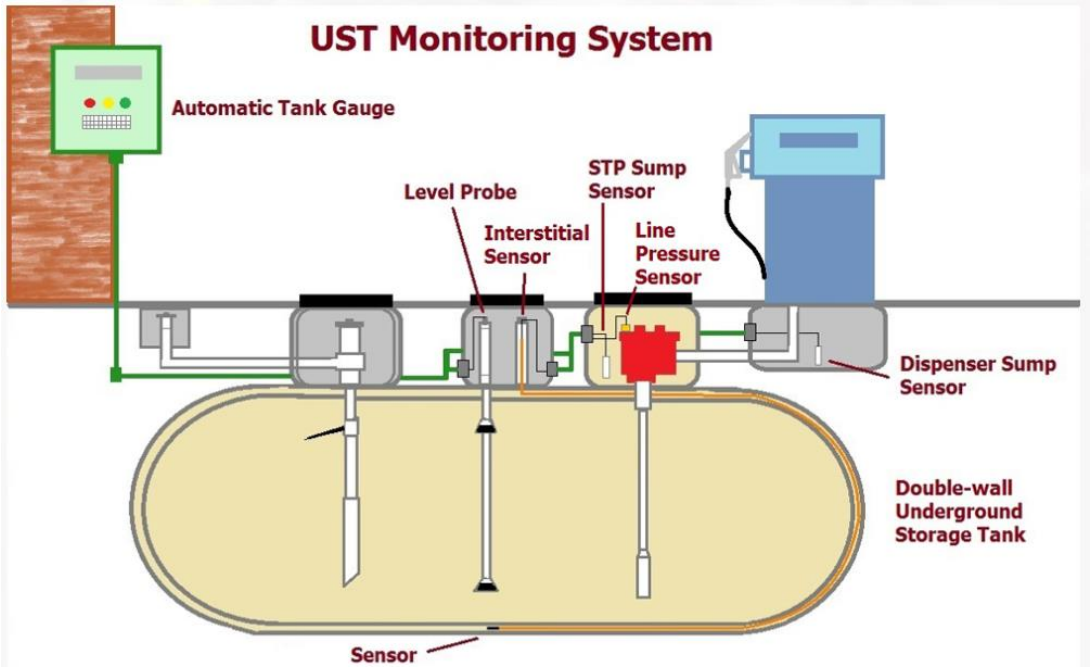
Estabrooks



Annual LLD Test form

Testing equipment

- Each have different procedures
- What is the same?
  - Test location
  - The hole used to simulate 3 gph @ 10 psi
  - Calibration step to ensure hole is right size
  - Metering pressure of MLLD
    (varies among LLD manufactures)

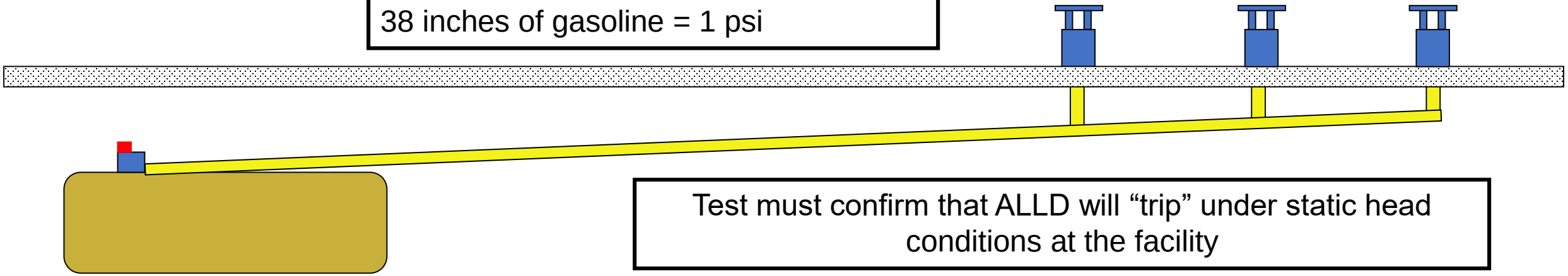


Why must test be conducted with ALLD installed in UST system and simulated leak created at the highest dispenser?

- Some mechanical ALLDs will not “trip” unless line pressure drops to 1-5 psi
- Not all piping is sloped back to the tank.
- Testing should be done at furthest dispenser. Furthest Diesel Satellite dispenser.

Head Pressure

38 inches of gasoline = 1 psi



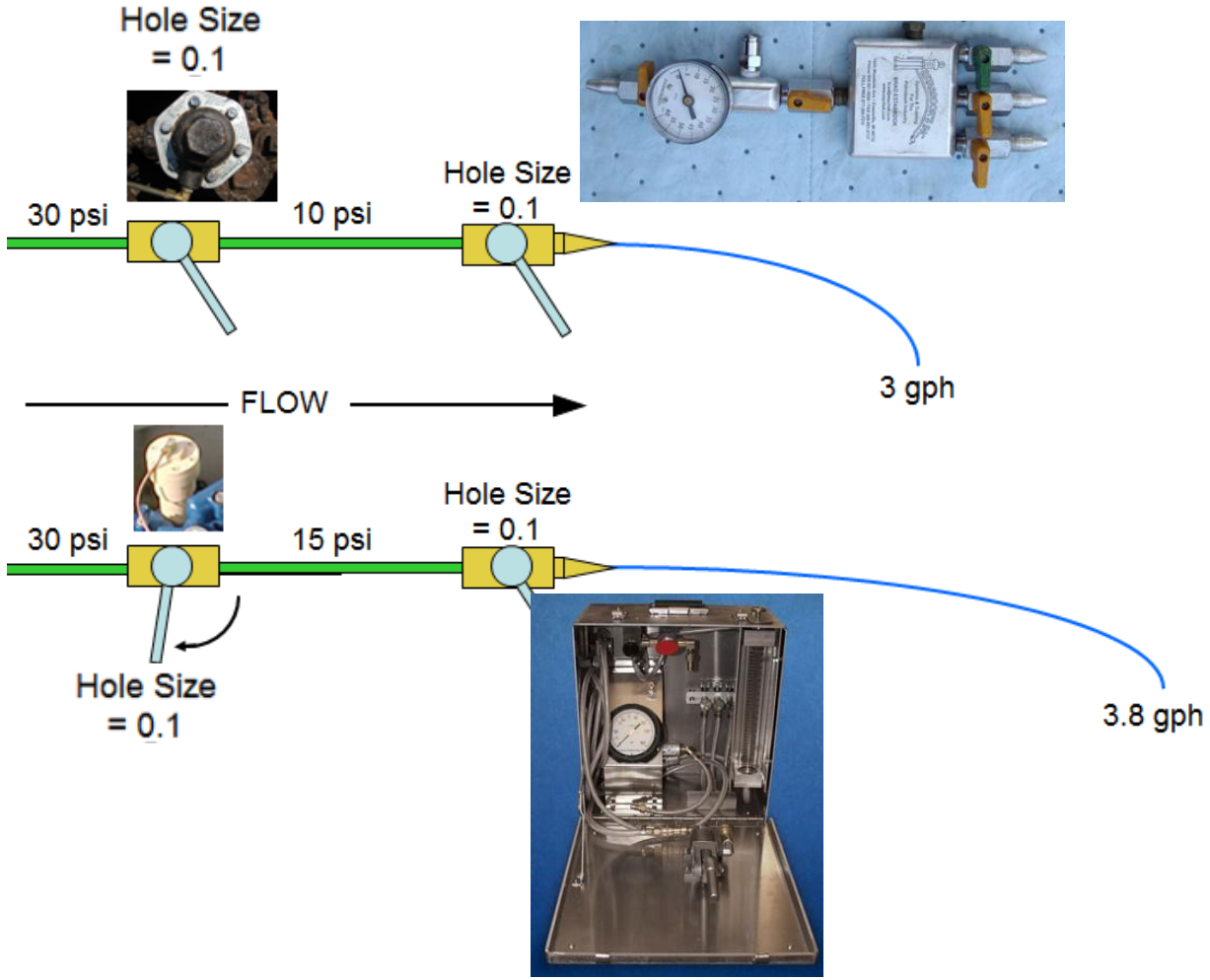
Test must confirm that ALLD will “trip” under static head conditions at the facility

Questions on form:

Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets (“trips”) when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Annual LLD Test

The Concept



- 10 psi @ 3 gph is nothing more than a hole size.
- The hole size in your test equipment models the hole size in the LLD.
- Hole in MLLD is < or = hole size in test equipment. (slow flow)
- Hole size is different depending on viscosity of fuel (diesel versus gas)
- Pressure behind the hole determines leak rate. (Leak rate may not be 3 gph)
- What your detecting is:
  - Will it detect this size hole?
    A 3 gph @ 10 psi sized hole?
- Main step is calibrating your hole size.

Annual LLD Test

The Hole Size – Mechanical LLDs

FE PETRO ALLD

BLUE = GASOLINE

FE PETRO ALLD

BEIGE = DIESEL

- Hole size is different for gas & diesel LLDs.
- Commonly you can't tell what you have. (Corrosion. Model #s unreadable.)
- Your test should show if it's an issue. That is why:
  - Calibration is important. Setting the right hole size.
  - Either it will see your leak & stay in slow flow, or it wont.

Annual LLD Test form

Calibration step

- Is the hole in your test equipment the right size?
- How do you tell?
- Do you need a regulator?
  - Not if your leak rate is correct.
  - Unless manufacturer requires you to.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

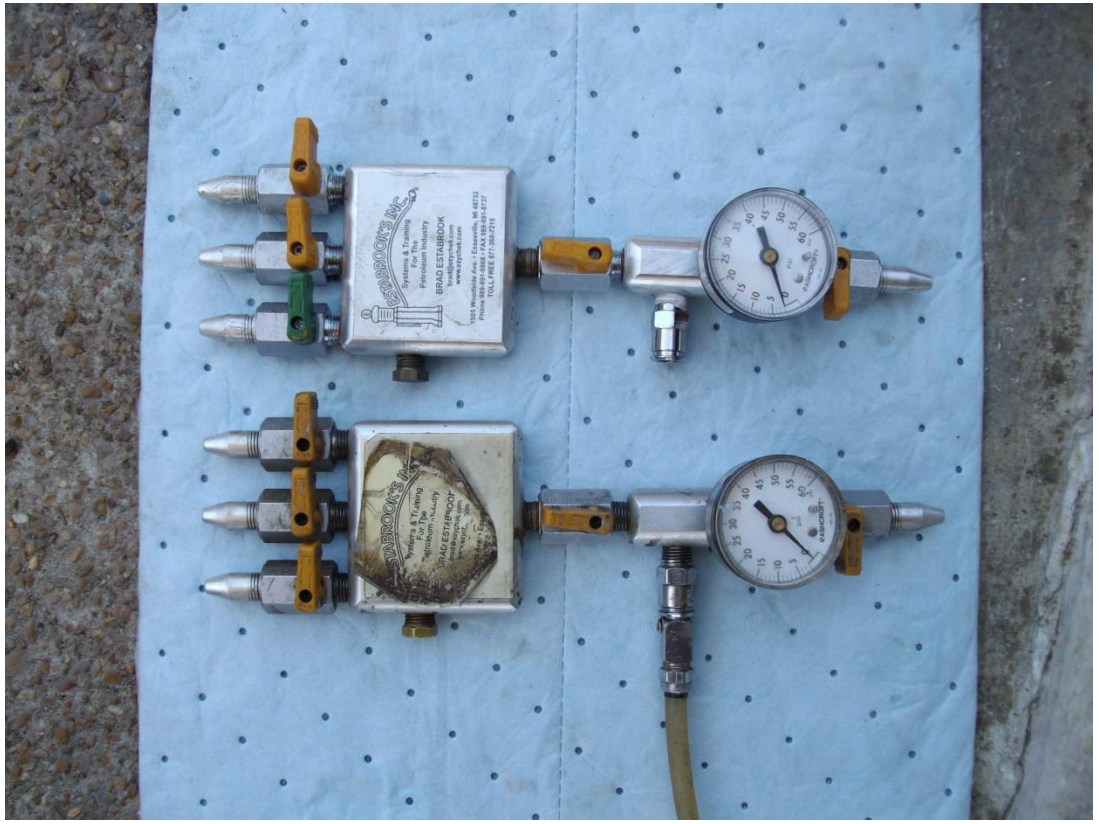
	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

Calibration step to ensure hole is right size

Hole size not adjustable



- For some test equipment you cannot change hole size.
- You still have to ensure the right size hole is used.
- Still have to calibrate the hole.
  - Ensure no trapped air.
  - Correct leak rate is simulated

Calibration step to ensure hole is right size

Hole size adjustable

- For some test equipment you have to manually set the hole size.
- Must calibrate the hole.
- Hole size is different for gas & diesel.
- You can’t just set the hole size on these and use them at every site

3 gph @ 10 psi is standard (hole size)
All of these are equivalent to it.

Your leak "Volume" verifies the hole is correct size.

Table 1 - Volume that must be discharged within indicated time frame to be equivalent to a leak rate of 3 gph @ 10 psi:						
Line Pressure	15 seconds	60 seconds		Line Pressure	15 seconds	60 seconds
5 psi	33 ml	134 ml		30 psi	82 ml	328 ml
6 psi	37 ml	147 ml		31 psi	83 ml	333 ml
7 psi	40 ml	158 ml		32 psi	85 ml	338 ml
8 psi	42 ml	169 ml		33 psi	86 ml	344 ml
9 psi	45 ml	179 ml		34 psi	87 ml	349 ml
10 psi	47 ml	189 ml		35 psi	89 ml	354 ml
11 psi	50 ml	198 ml		36 psi	90 ml	359 ml
12 psi	52 ml	207 ml		37 psi	91 ml	364 ml
13 psi	54 ml	216 ml		38 psi	92 ml	369 ml
14 psi	56 ml	224 ml		39 psi	94 ml	374 ml
15 psi	58 ml	232 ml		40 psi	95 ml	378 ml
16 psi	60 ml	239 ml		41 psi	96 ml	383 ml
17 psi	62 ml	247 ml		42 psi	97 ml	388 ml
18 psi	64 ml	254 ml		43 psi	98 ml	392 ml
19 psi	65 ml	261 ml		44 psi	99 ml	397 ml
20 psi	67 ml	268 ml		45 psi	100 ml	401 ml
21 psi	69 ml	274 ml		46 psi	102 ml	406 ml
22 psi	70 ml	281 ml		47 psi	103 ml	410 ml
23 psi	72 ml	287 ml		48 psi	104 ml	415 ml
24 psi	73 ml	293 ml		49 psi	105 ml	419 ml
25 psi	75 ml	299 ml		50 psi	106 ml	423 ml
26 psi	76 ml	305 ml		51 psi	107 ml	427 ml
27 psi	78 ml	311 ml		52 psi	108 ml	431 ml
28 psi	79 ml	317 ml		53 psi	109 ml	436 ml
29 psi	81 ml	322 ml		54 psi	110 ml	440 ml
Adjust size of test apparatus leak orifice until the indicated flow rate is achieved						

Leak Rate is Nothing but a number.

Table 2 – Conversion of leak rate from milliliters per minute (ml/min) to gallons per hour (gph)						
Leak Rate (ml/min)	Leak Rate (gph)		Leak Rate (ml/min)	Leak Rate (gph)		Leak Rate (ml/min)	Leak Rate (gph)
134	2.1		281	4.5		374	5.9
147	2.3		287	4.6		378	6.0
158	2.5		293	4.7		383	6.1
169	2.7		299	4.7		388	6.2
179	2.8		305	4.8		392	6.2
189	3.0		311	4.9		397	6.3
198	3.1		317	5.0		401	6.4
207	3.3		322	5.1		406	6.4
216	3.4		328	5.2		410	6.5
224	3.5		333	5.3		415	6.6
232	3.7		338	5.4		419	6.6
239	3.8		344	5.5		423	6.7
247	3.9		349	5.5		427	6.8
254	4.0		354	5.6		431	6.8
261	4.1		359	5.7		436	6.9
268	4.2		364	5.8		440	7.0
274	4.3		369	5.9		445	7.1
Note: 1 gallon per hour = 63.06 milliliters per minute							

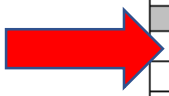
You can calibrate the orifice using:

- Full pump pressure or
- Regulated pressure (pressure you regulate down to)

Annual LLD Test form

Calibration step

- With equipment hooked up.
- STP “ON” what is full pump pressure?
  - 30 psi.
- Open your test equipment. Start leak. What is your leak volume in 60 sec?
  - At 30 psi it should be < or = 328 mL (previous slide / tables)
- If it is, then your hole is set.
- You matched what is on the chart.
- This applies to both MLLDs & PLLDs



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

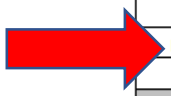
Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

Annual LLD Test form

Calibration step with regulator

- Some manufactures may require you to regulate down to 10 psi.
- STP “ON” what is full pump pressure?
  - 30 psi.
- Open your test equipment. Start leak. Regulate pressure down to 10 psi. What is your leak volume in 60 sec?
  - At 10 psi it should be < or = 189 mL (previous tables)
- If it is, then your hole is set.
- You matched what is on the chart.
- This applies to both MLLDs & PLLDs



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

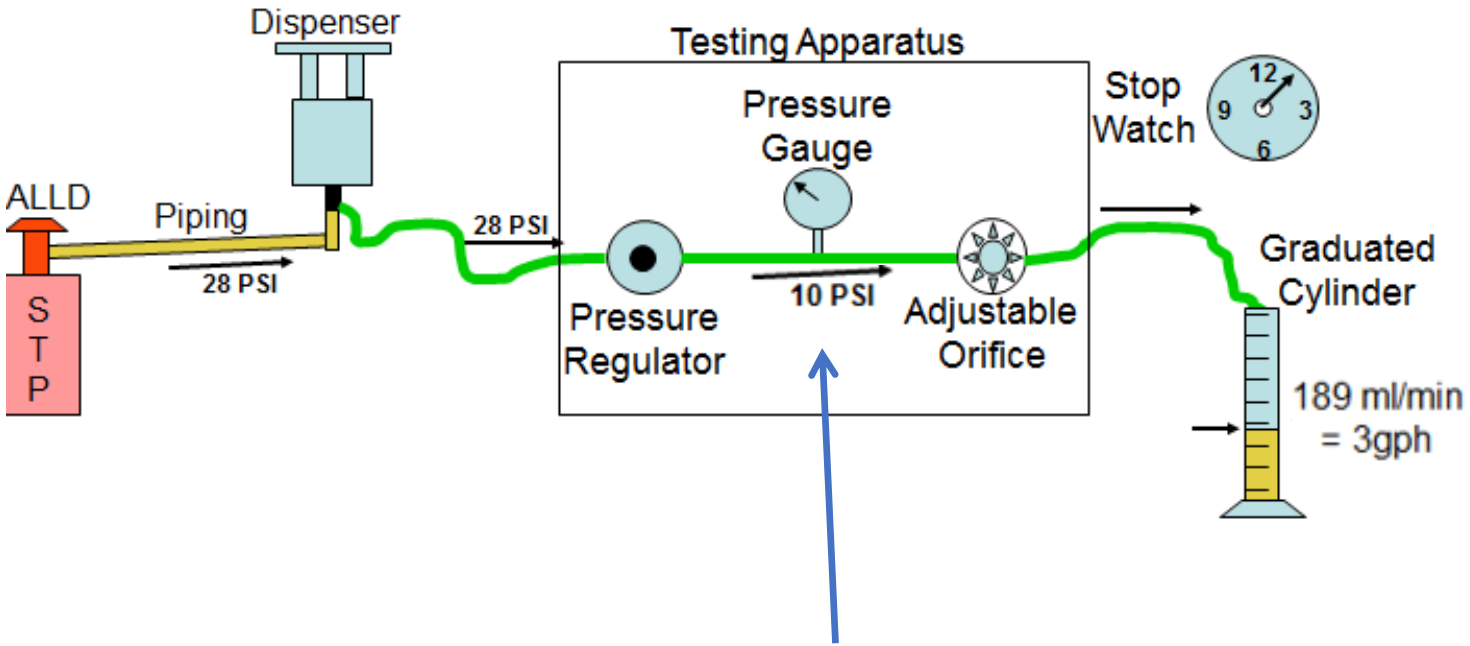
	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

Annual LLD Test form

Calibration step using pressure regulator



- Using inline pressure regulator adjust to 10 psi.
- Next adjust orifice (hole) until your getting ~189 mL/min.
- Your hole is now set. DO not adjust it anymore.
- Remove pressure regulator. Perform LLD test.

Annual LLD Test form

Calibration step

- Whether you calibrate at “Full Pump” or another pressure does NOT matter as long as:
  - Leak volume matches what's on chart for that pressure.
- It is much easier to calibrate using “Full Pump” pressure.

Table 1 - Volume that must be discharged within indicated time frame to be equivalent to a leak rate of 3 gph @ 10 psi:

Line Pressure	15 seconds	60 seconds		Line Pressure	15 seconds	60 seconds
5 psi	33 ml	134 ml		30 psi	82 ml	328 ml
6 psi	37 ml	147 ml		31 psi	83 ml	333 ml
7 psi	40 ml	158 ml		32 psi	85 ml	338 ml
8 psi	42 ml	169 ml		33 psi	86 ml	344 ml
9 psi	45 ml	179 ml		34 psi	87 ml	349 ml
10 psi	47 ml	189 ml		35 psi	89 ml	354 ml
11 psi	50 ml	198 ml		36 psi	90 ml	359 ml
12 psi	52 ml	207 ml		37 psi	91 ml	364 ml
13 psi	54 ml	216 ml		38 psi	92 ml	369 ml
14 psi	56 ml	224 ml		39 psi	94 ml	374 ml
15 psi	58 ml	232 ml		40 psi	95 ml	378 ml
16 psi	60 ml	239 ml		41 psi	96 ml	383 ml

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

Comments:

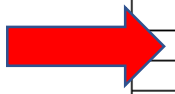
PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

Annual LLD Test form

MLLDs

- The order of questions was switched.
- This should model your typical test in the order that you record the #s.

- What is your metering pressure?
  - It is slow flow psi
  - Its not always 10 psi



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

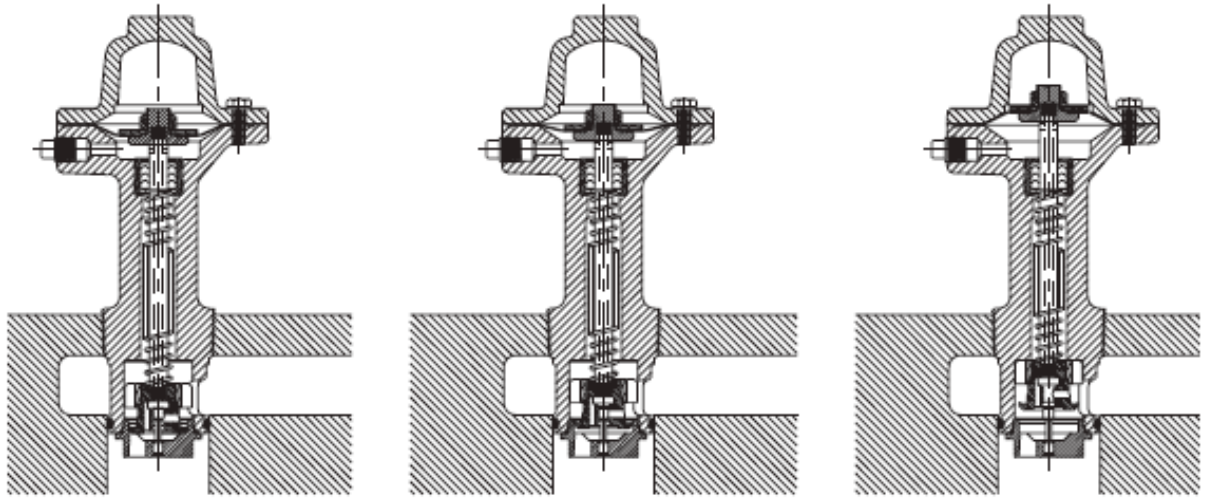
	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

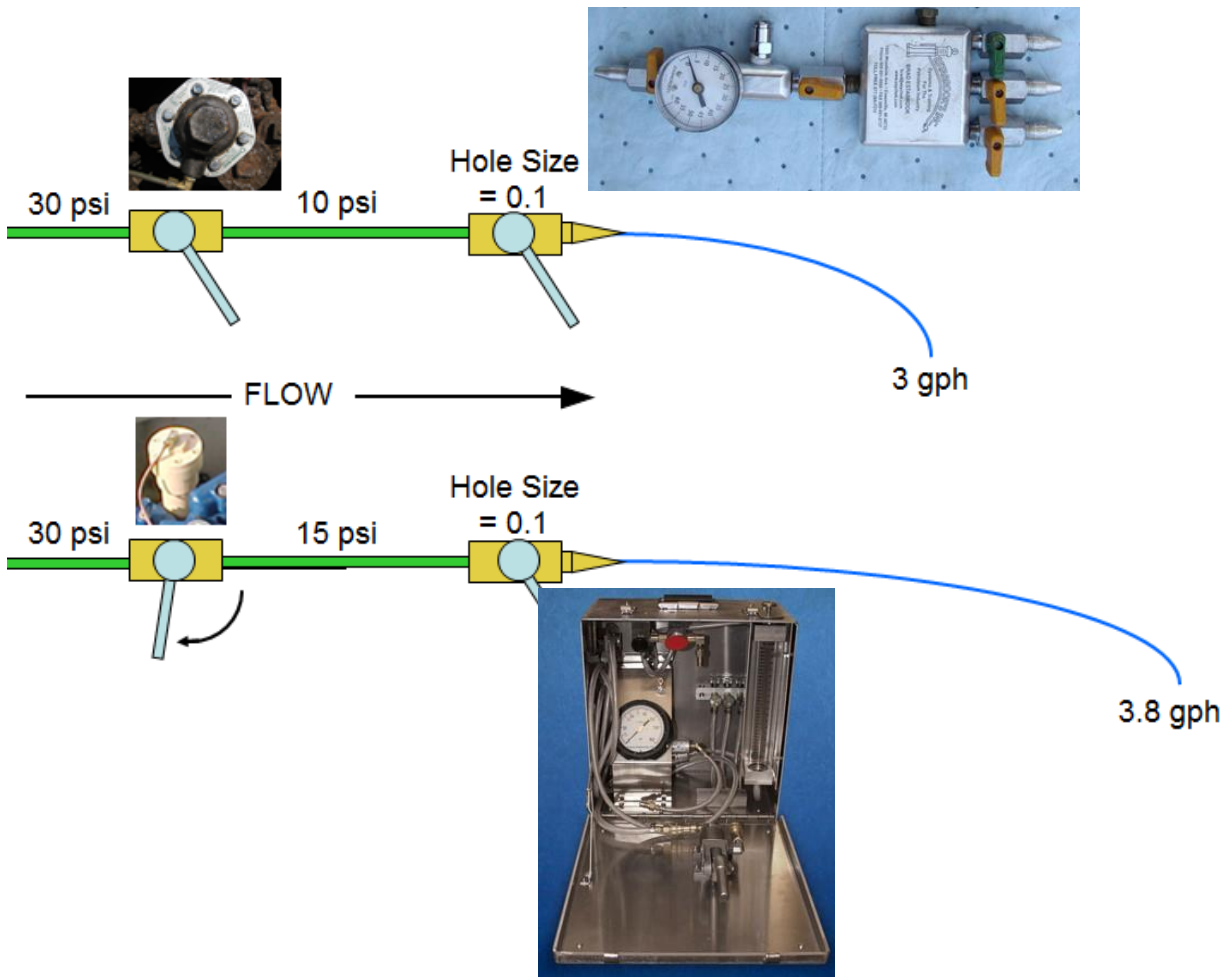
Metering pressure

(Depends mainly on MLLD manufacturer)



Mechanical Line Leak Detector		"Closed Position"	Metering Pressure
Manufacturer	Model	(PSI)	(PSI)
Red Jacket	FX1V or FX1DV	3 – 5	8-16
Red Jacket	XLP	1	20-22
FE Petro		1	12-17
Vaporless	LD2000 (No Vent)	4	12-15
Vaporless	LD2000	3	22-24
Vaporless	LD2200	2.5	22-24
Vaporless	LD3000	8	21

Metering pressure
(Depends mainly on MLLD manufacturer)



- With hole set & leak simulated:
  - Flow is restricted to Metering pressure by the mechanical LLD

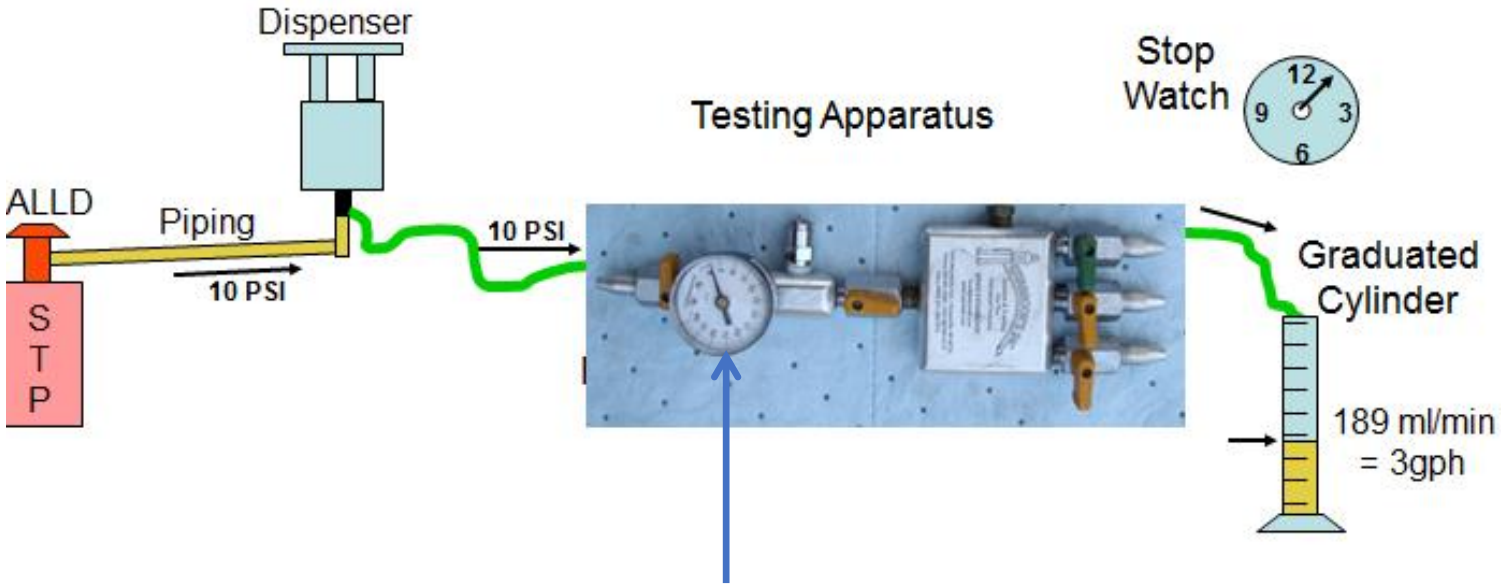
    (slow flow)
  - Metering pressure should register on your test equipment

- Metering pressure determines leak rate.

  (Higher pressure higher leak rate.)

Metering pressure

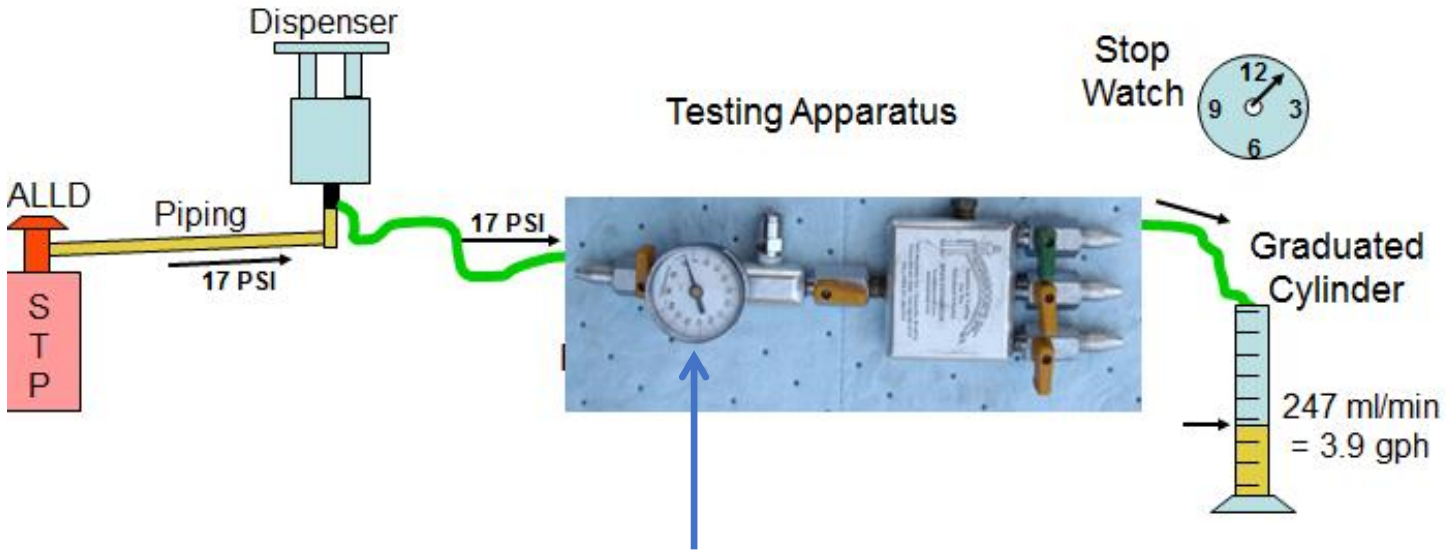
Test equipment – common issue



- Will metering pressure always be at 10 psi?
- NO. Depends on:
  - Type of Mechanical LLD
  - The size hole in mechanical LLD
  - Trapped air & other factors

Metering pressure

Test equipment – common issue

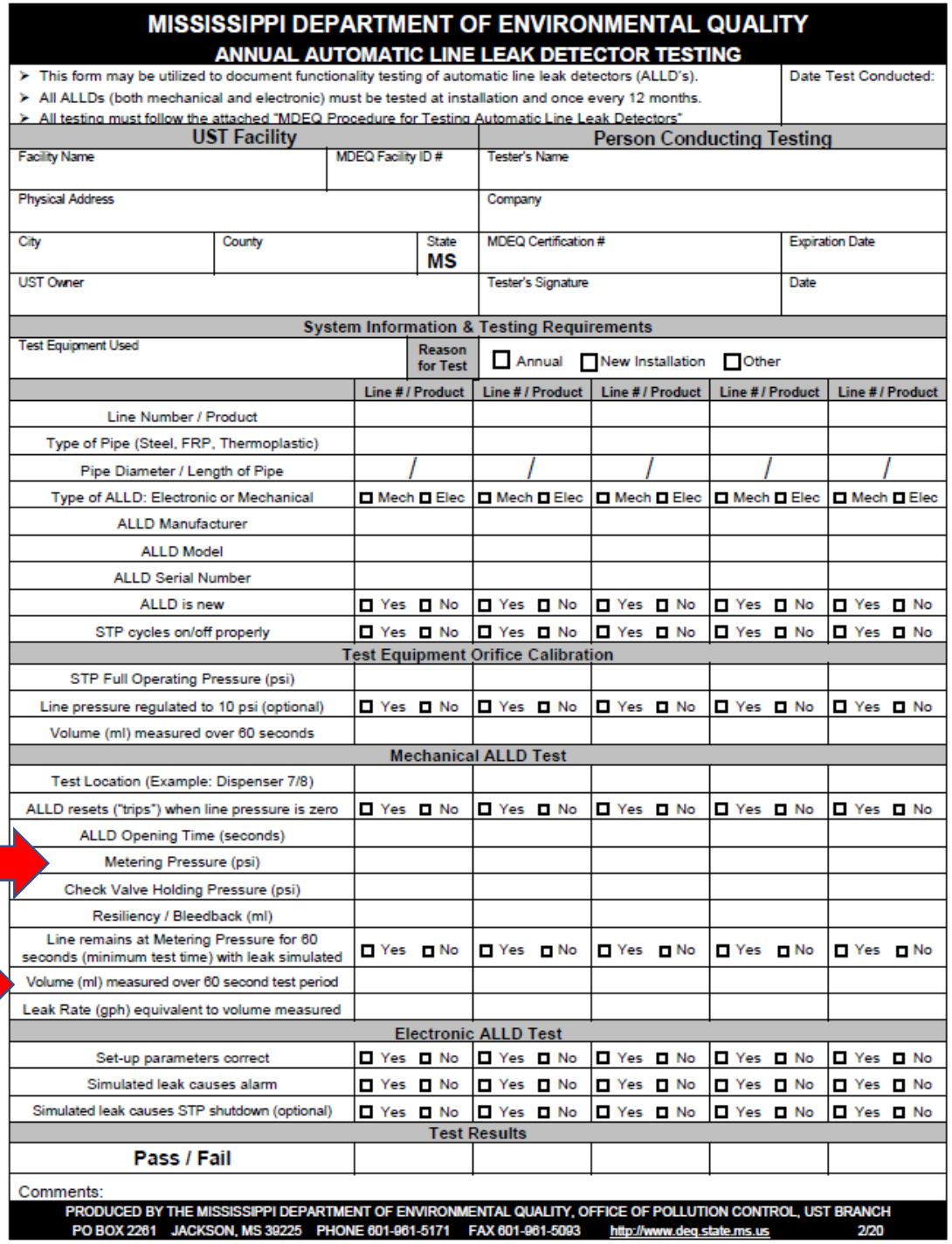


- Metering pressure maybe 17 psi.
- Producing ~ 247 mL/min = 3.9 gph leak rate
  - This is equivalent to 10 psi @ 3 gph hole size
- Leak rate is governed by metering pressure
- You have to measure your leak…..
  - If your leak isn't near 247 mL / min you did not run a good test. Air in line

Annual LLD Test form

MLLDs

- Metering pressure should be slow flow psi, with leak simulated, through the hole you set and calibrated.
- You must now again measure the volume of the leak you simulated.
- This time is to confirm your test is good & hole set properly (again)
- Your:
  - Volume measured
  - Leak Rate equivalent
    - Should match what is on charts for metering psi.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

Leak Rate Simulated

Remember: 3 gph @ 10 psi is only the HOLE size
All of these are equivalent to it.

Table 1 - Volume that must be discharged within indicated time frame to be equivalent to a leak rate of 3 gph @ 10 psi:

Line Pressure	15 seconds	60 seconds		Line Pressure	15 seconds	60 seconds
5 psi	33 ml	134 ml		30 psi	82 ml	328 ml
6 psi	37 ml	147 ml		31 psi	83 ml	333 ml
7 psi	40 ml	158 ml		32 psi	85 ml	338 ml
8 psi	42 ml	169 ml		33 psi	86 ml	344 ml
9 psi	45 ml	179 ml		34 psi	87 ml	349 ml
10 psi	47 ml	189 ml		35 psi	89 ml	354 ml
11 psi	50 ml	198 ml		36 psi	90 ml	359 ml
12 psi	52 ml	207 ml		37 psi	91 ml	364 ml
13 psi	54 ml	216 ml		38 psi	92 ml	369 ml
14 psi	56 ml	224 ml		39 psi	94 ml	374 ml
15 psi	58 ml	232 ml		40 psi	95 ml	378 ml
16 psi	60 ml	239 ml		41 psi	96 ml	383 ml
17 psi	62 ml	247 ml		42 psi	97 ml	388 ml
18 psi	64 ml	254 ml		43 psi	98 ml	392 ml
19 psi	65 ml	261 ml		44 psi	99 ml	397 ml
20 psi	67 ml	268 ml		45 psi	100 ml	401 ml
21 psi	69 ml	274 ml		46 psi	102 ml	406 ml
22 psi	70 ml	281 ml		47 psi	103 ml	410 ml
23 psi	72 ml	287 ml		48 psi	104 ml	415 ml
24 psi	73 ml	293 ml		49 psi	105 ml	419 ml
25 psi	75 ml	299 ml		50 psi	106 ml	423 ml
26 psi	76 ml	305 ml		51 psi	107 ml	427 ml
27 psi	78 ml	311 ml		52 psi	108 ml	431 ml
28 psi	79 ml	317 ml		53 psi	109 ml	436 ml
29 psi	81 ml	322 ml		54 psi	110 ml	440 ml
Adjust size of test apparatus leak orifice until the indicated flow rate is achieved						

Table 2 – Conversion of leak rate from milliliters per minute (ml/min) to gallons per hour (gph)

Leak Rate (ml/min)	Leak Rate (gph)		Leak Rate (ml/min)	Leak Rate (gph)		Leak Rate (ml/min)	Leak Rate (gph)
134	2.1		281	4.5		374	5.9
147	2.3		287	4.6		378	6.0
158	2.5		293	4.7		383	6.1
169	2.7		299	4.7		388	6.2
179	2.8		305	4.8		392	6.2
189	3.0		311	4.9		397	6.3
198	3.1		317	5.0		401	6.4
207	3.3		322	5.1		406	6.4
216	3.4		328	5.2		410	6.5
224	3.5		333	5.3		415	6.6
232	3.7		338	5.4		419	6.6
239	3.8		344	5.5		423	6.7
247	3.9		349	5.5		427	6.8
254	4.0		354	5.6		431	6.8
261	4.1		359	5.7		436	6.9
268	4.2		364	5.8		440	7.0
274	4.3		369	5.9		445	7.1
Note: 1 gallon per hour = 63.06 milliliters per minute							

Metering pressure depends on model MLLD.

May or may not be 10 psi

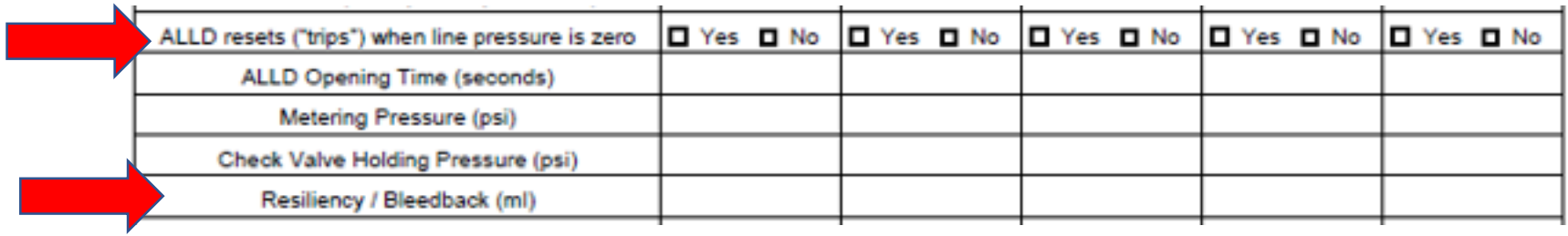
Bleedback volume

(Normal Pipe Configurations)

- Bleedback volume is the leak. The volume of loss needed to trip LLD (0 psi)
- It is the volume of loss from “Holding pressure” down to 0 psi
- High bleed back volume, means it will take longer time for LLD to trip.
- High bleed back volumes can indicate:
  - Trapped air in the lines. (Long Opening times)
  - Stretchy flexible pipe – near failure
- How much is to much? Difficult to put a # on it.
- In general: If your bleed back volume increases substantially from previous LLD test it can indicate line failure early on.
- Measure and record bleed back accurately.

Table 1 - Volume that must be discharged within indicated time frame to be equivalent to a leak rate of 3 gph @ 10 psi:

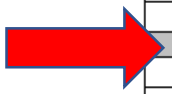
Line Pressure	15 seconds	60 seconds		Line Pressure	15 seconds	60 seconds
5 psi	33 ml	134 ml		30 psi	82 ml	328 ml
6 psi	37 ml	147 ml		31 psi	83 ml	333 ml
7 psi	40 ml	158 ml		32 psi	85 ml	338 ml
8 psi	42 ml	169 ml		33 psi	86 ml	344 ml
9 psi	45 ml	179 ml		34 psi	87 ml	349 ml
10 psi	47 ml	189 ml		35 psi	89 ml	354 ml
11 psi	50 ml	198 ml		36 psi	90 ml	359 ml
12 psi	52 ml	207 ml		37 psi	91 ml	364 ml
13 psi	54 ml	216 ml		38 psi	92 ml	369 ml
14 psi	56 ml	224 ml		39 psi	94 ml	374 ml
15 psi	58 ml	232 ml		40 psi	95 ml	378 ml
16 psi	60 ml	239 ml		41 psi	96 ml	383 ml
17 psi	62 ml	247 ml		42 psi	97 ml	388 ml

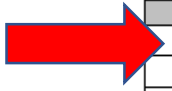


ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					

Electronic PLLDs

- You still have to:
  - calibrate your orifice.
  - Simulate your leak.
  - Ensure that PLLD catches it.
    (Alarm on ATG)
- Correct parameters are input?
  - Question is on ATG & LLD test form
    - If general, if PLLD passes 3 gph LLD test you simulate pass it on LLD test form.
    - Programed parameters are much more critical for 0.2 & 0.1 gph leak tests





MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL AUTOMATIC LINE LEAK DETECTOR TESTING

- This form may be utilized to document functionality testing of automatic line leak detectors (ALLD's).
- All ALLDs (both mechanical and electronic) must be tested at installation and once every 12 months.
- All testing must follow the attached "MDEQ Procedure for Testing Automatic Line Leak Detectors"

Date Test Conducted:

UST Facility			Person Conducting Testing	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

System Information & Testing Requirements

Test Equipment Used | Reason for Test: ☐ Annual ☐ New Installation ☐ Other

	Line # / Product	Line # / Product	Line # / Product	Line # / Product	Line # / Product
Line Number / Product					
Type of Pipe (Steel, FRP, Thermoplastic)					
Pipe Diameter / Length of Pipe	/	/	/	/	/
Type of ALLD: Electronic or Mechanical	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec	☐ Mech ☐ Elec
ALLD Manufacturer					
ALLD Model					
ALLD Serial Number					
ALLD is new	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
STP cycles on/off properly	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Equipment Orifice Calibration					
STP Full Operating Pressure (psi)					
Line pressure regulated to 10 psi (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 seconds					
Mechanical ALLD Test					
Test Location (Example: Dispenser 7/8)					
ALLD resets ("trips") when line pressure is zero	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ALLD Opening Time (seconds)					
Metering Pressure (psi)					
Check Valve Holding Pressure (psi)					
Resiliency / Bleedback (ml)					
Line remains at Metering Pressure for 60 seconds (minimum test time) with leak simulated	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Volume (ml) measured over 60 second test period					
Leak Rate (gph) equivalent to volume measured					
Electronic ALLD Test					
Set-up parameters correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak causes STP shutdown (optional)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Test Results					
Pass / Fail					

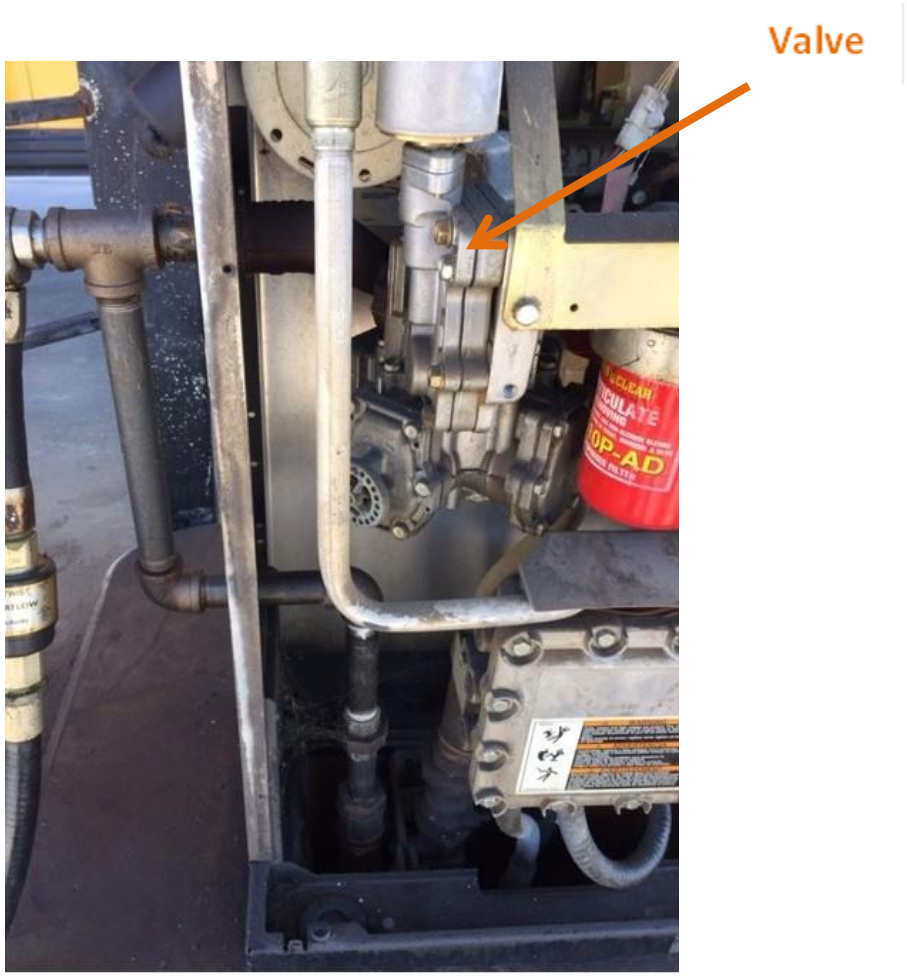
Comments:

PRODUCED BY THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, UST BRANCH
PO BOX 2261 JACKSON, MS 39225 PHONE 601-961-5171 FAX 601-961-5093 http://www.deq.state.ms.us 2/20

LLD test should be performed under “Normal” operating conditions.

- STPs should cycle On/off as they normally do.
- At no time should you have to:
  - Shut off a ball valve
  - Adjust settings on smart controller
  - Have prior authorization from store clerk. (solenoid valves)
- Multiple STPs – smart controllers
  - Once 1 STP senses leak and goes into slow flow the controller should prevent all other STPs from cycling “ON”
  - This should be confirmed.
  - Raise handles at multiple dispensers.
  - Are you still in slow flow?

Diesel Satellite lines / solenoid valves



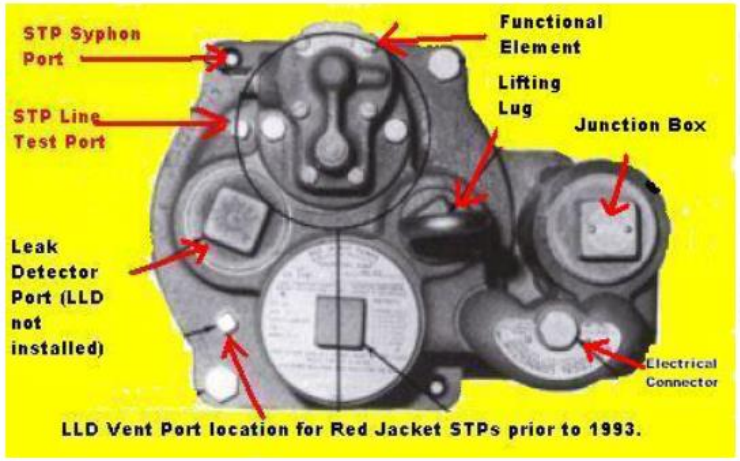
- Still maybe few of these around.
- LLD test should always be performed at furthest diesel sat SV.

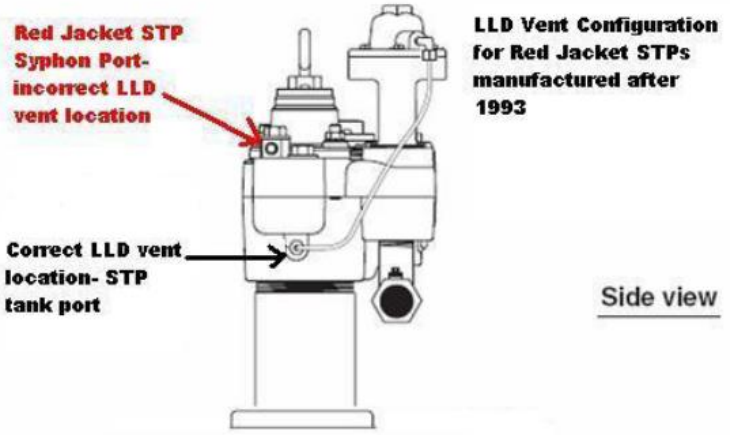
- Satellite line is masked by valve.
- Leak cannot be seen by LLD.

LLDs made to vent must vent unrestricted

Where the vent line drains to also matters.

- Drain line connected to Syphon port.
- Very bad idea.
- Will prevent Mechanical LLD from staying in slow flow.
- No slow flow – No indication of 3 gph leak.
- This should show up on your LLD test if done properly.





LTT Equipment

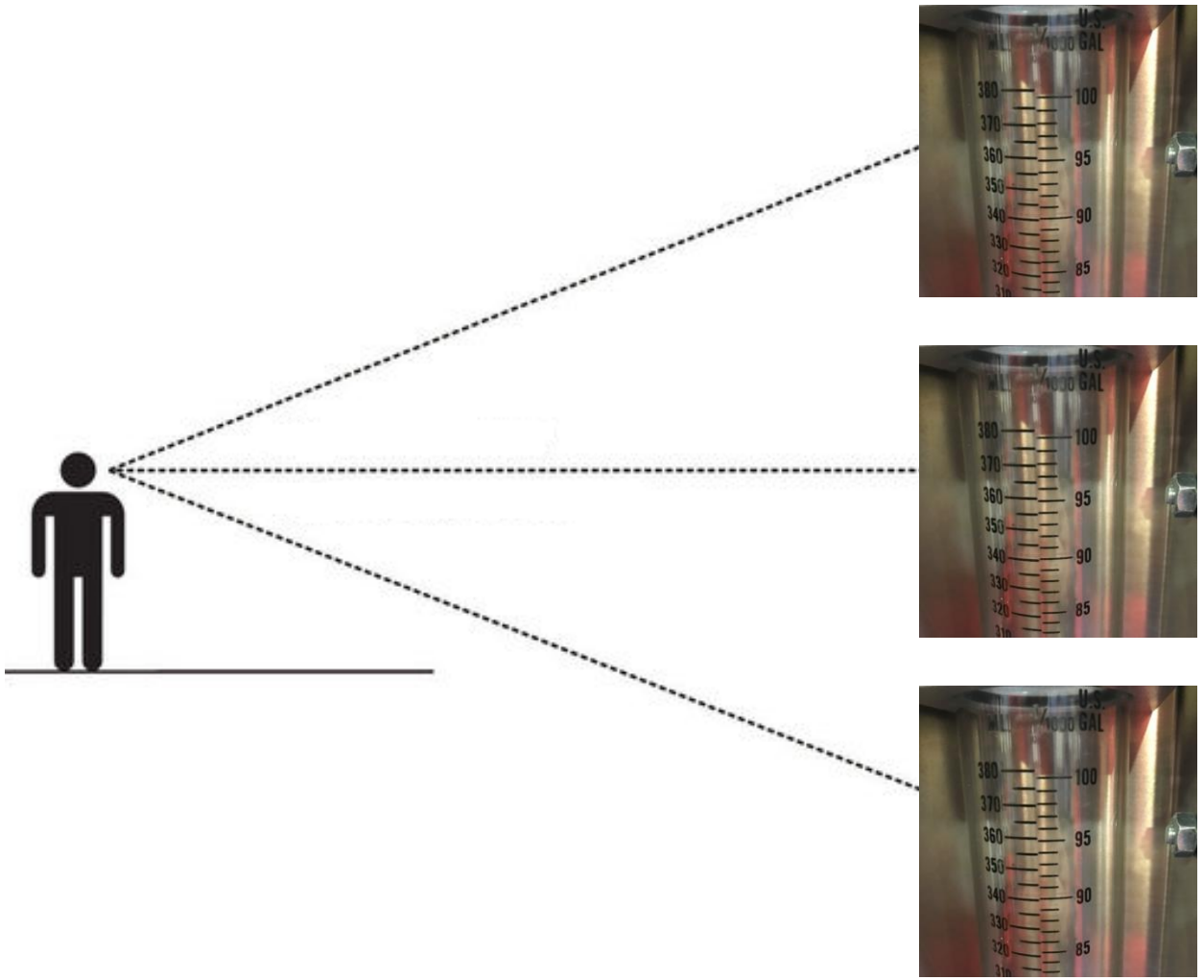
Volumetric

Constant Pressure

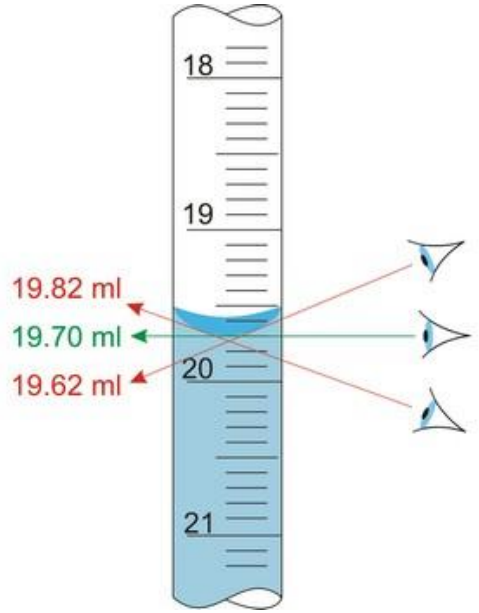
- Care should be taken when:
  - Reading Burette
- A leak is a leak.
- Even if it does NOT meet the threshold to fail.
  - MDEQ wants to see the data.
  - We want to know if a leak is present even if it does not meet threshold.
  - What does your data show?
- EVERY line fails until you make it prove itself, beyond a doubt as passing.

Reading the Burette

It is easy to say, OH that looks close enough.
Applies to both methods.



- You could easily get several readings for the same level depending on how you look.
- Your line of Sight MUST be consistent for each reading.
- Straight on is more accurate
- Top or bottom of Meniscus?
  - Bottom



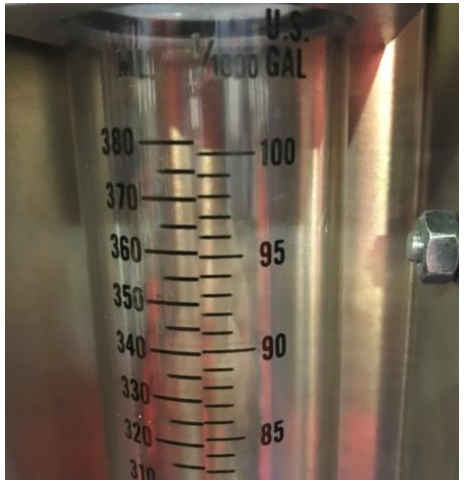
Line tightness testing
(Issues we see)

- All tests must be done at 1.5 times the operating pressure of the STP. The test pressure should be clearly stated on the form that you use.
- Know the limitations / restrictions of your test equipment. Ex:
  - Line Capacity.
  - Pre-test requirements
- Can you test gas lines with diesel lines on the same test? No.

LTT Equipment

Use of Manifold – Volumetric - Petrotite

Number of Lines	Test Times	Number of Consecutive Readings	Interval
1	30 Minutes	Six (6)	5 Minutes
2	30 Minutes	Three (3)	10 Minutes
3	30 Minutes	Two (2)	15 Minutes



- Originally evaluated for consecutive 15 min intervals
- Will you see larger loss in 5 min or 15 min? (Be careful reading burette)

- Consecutive Readings
- Net volume change not exceeding +/- 0.01 gph for hour test
- Net volume change not exceeding +/- 0.005 gph for 30 minute test
- Net volume change being what?
  - The difference between initial and final reading?

- Does it matter?
  - Quicker readings may let you test quicker. Aides in keeping pressure constant.
  - All well below typical 0.05 gph threshold

Certified Contractor Regulations

- Everyone should be licensed. (Options: Installer, Technician, Closure, CP tester)
- New Licenses:
  - Installer and/or Closure – Proof of 2 years experience
  - Technician – Proof of 1 year experience.
  - CP tester – proof of completion of approved course. (NACE, STI, PETCON, ALPEC, GTEC)
  - All applicable manufacturer and/or test equipment certifications.
- Current Installer License Renewals (After 8/23/20):
  - required to have CP tester license.
  - required to provide copies of all manufacturer and/ or test equipment certifications.
  - Good news:
    - You can choose to drop your closure license.
    - We do accept Technician Courses as continuing education for installer license renewals.
    - Manufacturer certification **NOT** required for LLD tester / LLD equipment.

Manufacturer Certifications Required

List maybe found here:

- https://www.mdeq.ms.gov/wp-content/uploads/2018/12/UstManufacturerList.pdf

- In General:
  - All Precision 0.1 gph test equipment.
  - Installation of Primary UST components. (Tank, pipe) (Excludes: Flex connectors / ball valves, etc.)
  - UST products made to contain a release from UST equipment. (2 part sumps, DW sumps, new or retrofit sump fittings)
- If you see something not listed, ask us

Secondary Containment Sump Penetration fitting			
Manufacturer	**Penetration Type**	**Certifications**	
Diversified Products Manufacturing, Inc.	Traditional boots	New & Split Repair	3 years
Bravo Systems	FRP Entry Fittings		3 years
	FRP Retrofit Fittings		3 years
Icontainment	Split Repair Fittings		2 years
ATG Manufacturer Certifications			
Manufacturer	**Equipment**	**Certifications**	**Period**
All ATG manufacturers that provide certification for "Start-Up" programing of ATGs.			
Testing Certifications required			
Manufacturer	**Equipment**	**Certifications**	**Period**
Hasstech	Acurite	Pipeline Tester	2 years
Estabrook's EZY Chek Systems	EZY 3 Locator Plus	Tank Tightness tester	2 years
	Product Line Tester	Product Line Tester	2 years
Franklin Fueling Systems	Incon TS-STS	Sump Test System	2 years.
Mesa Engineering	Mesa 2-D Method with ACT water level sensor	Tank tightness tester	2 years

Certified Contractor Regulations

Reporting requirement

- You are required to notify tank owner in writing whenever testing fails.

  (annual, monthly LD, specialty tests)

- You can do this by:
  - Providing them copy of test report.
  - Describe the issue on invoice to them.
  - Notify them by email or mail.

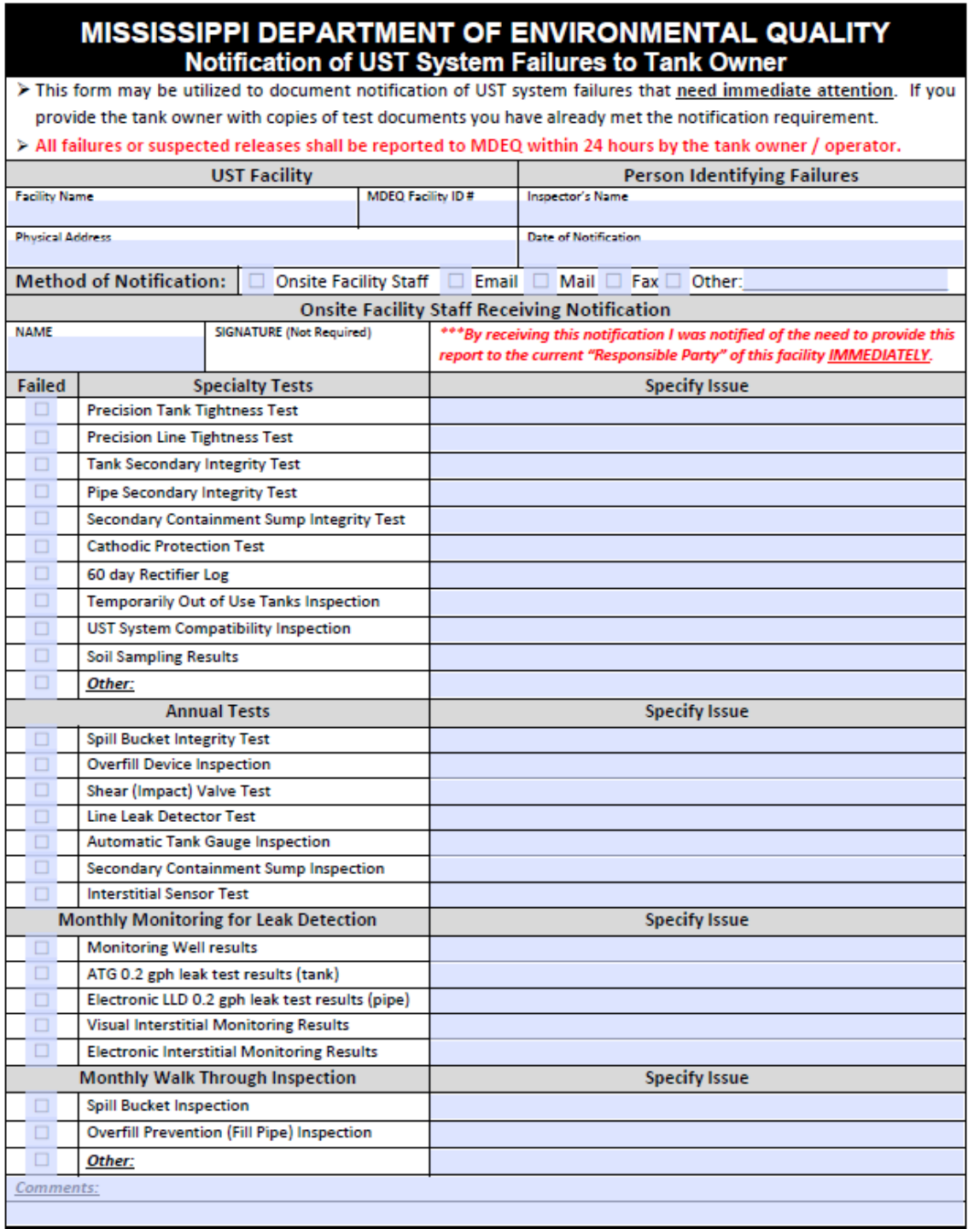
    (Something do document the exchange.)
  - Use our form:

    (Should make it easier on you. Attach it to invoice.)

    (NO you don't have to go into great detail on the issue.)

**Tank owner should report it to MDEQ.

**If you have an issue with a tank owner, send this form to MDEQ.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
Notification of UST System Failures to Tank Owner

- This form may be utilized to document notification of UST system failures that need immediate attention. If you provide the tank owner with copies of test documents you have already met the notification requirement.
- All failures or suspected releases shall be reported to MDEQ within 24 hours by the tank owner / operator.

UST Facility		Person Identifying Failures
Facility Name	MDEQ Facility ID #	Inspector's Name
Physical Address		Date of Notification

Method of Notification: ☐ Onsite Facility Staff ☐ Email ☐ Mail ☐ Fax ☐ Other:

Onsite Facility Staff Receiving Notification		
NAME	SIGNATURE (Not Required)	***By receiving this notification I was notified of the need to provide this report to the current "Responsible Party" of this facility IMMEDIATELY.

Failed	Specialty Tests	Specify Issue
☐	Precision Tank Tightness Test	
☐	Precision Line Tightness Test	
☐	Tank Secondary Integrity Test	
☐	Pipe Secondary Integrity Test	
☐	Secondary Containment Sump Integrity Test	
☐	Cathodic Protection Test	
☐	60 day Rectifier Log	
☐	Temporarily Out of Use Tanks Inspection	
☐	UST System Compatibility Inspection	
☐	Soil Sampling Results	
☐	Other:	
	Annual Tests	**Specify Issue**
☐	Spill Bucket Integrity Test	
☐	Overfill Device Inspection	
☐	Shear (Impact) Valve Test	
☐	Line Leak Detector Test	
☐	Automatic Tank Gauge Inspection	
☐	Secondary Containment Sump Inspection	
☐	Interstitial Sensor Test	
	Monthly Monitoring for Leak Detection	**Specify Issue**
☐	Monitoring Well results	
☐	ATG 0.2 gph leak test results (tank)	
☐	Electronic LLD 0.2 gph leak test results (pipe)	
☐	Visual Interstitial Monitoring Results	
☐	Electronic Interstitial Monitoring Results	
	Monthly Walk Through Inspection	**Specify Issue**
☐	Spill Bucket Inspection	
☐	Overfill Prevention (Fill Pipe) Inspection	
☐	Other:	

Comments:

Repairs

- All repairs must be retested and documented on forms.
- Includes (but not limited to)
  - OF devices, LLDs, Sensors, ATG probes, CP modifications, LTTs
- If MDEQ does not see retest, tank owner will be cited.

UST Technical Regulation Changes
Due Dates

- 10/5/18 - Past Due
  - Alternative Fuel / hazardous Substance Compatibility checklist
    - https://www.mdeq.ms.gov/wp-content/uploads/2018/11/CompatibilityChecklist.pdf
  - Systems storing greater than E10 or B20
  - The push for E-15. Pipe dope prior to 2007 likely NOT compatible. If they went cheap after 2007, still likely NOT compatible.
  - (Check equipment invoices from install.)
  - If they can't prove the pipe dope you may as well stop there and fail it.
- 10/5/19 – Past Due
  - Annual Inspection of Temporarily out of use UST systems
  - Annual Sump inspection
    - Required for all piping sumps using Interstitial Monitoring.
      (Sumps using Sensors was previously deferred.)

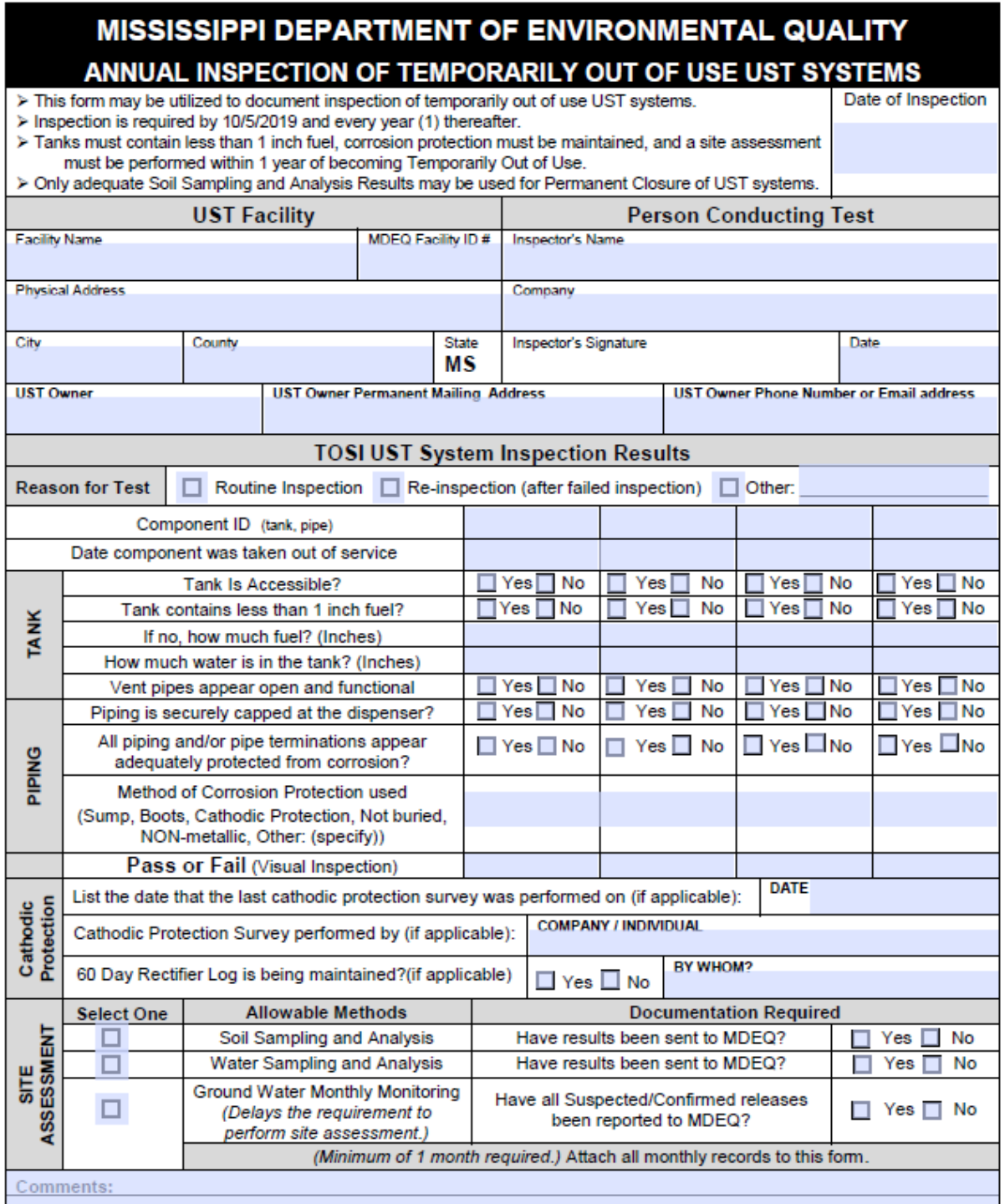
UST Technical Regulation Changes Due Dates

- 10/5/21
  - Containment Sump Integrity test (Hydro test)
    - Required for all sumps using Interstitial monitoring
  - Emergency Power Generator Tanks / piping
    - Required to have leak detection.
  - Monthly Walk Through Inspection
    - https://www.mdeq.ms.gov/wp-content/uploads/2019/04/MonthlyWalkthroughAnnual.pdf
    - https://www.mdeq.ms.gov/wp-content/uploads/2019/04/MonthlyWalkthroughMonthly.pdf
    - They can choose to use Monthly OR Annual version.
    - Monthly was setup for contractors to use / billing.
    - If you can talk them into doing the “Recommended Sections” please do so.
  - Annual Hand Held Release Detection Equipment inspection – bailers / sticks
    - If they don’t use SIR or monthly GW / Vapor monitoring, then they don’t need it.

Annual TOSI Inspection

- If you don't know the date it went TOSI leave it blank.
- Pipe securely capped at dispenser.
  - If it's still hooked up to dispenser that is fine.
- If they use GW / Vapor monitoring to meet the site assessment:
  - Only one monthly record needed.
  - Wells must be installed properly.
    - Spacing.
      (2 @ end single tank, 4 @ corner multiple tanks)
    - Depth – 1 ft below tank bottom (dry wells)
    - Water level below MW slots (wet wells)
- Power to STP should be shut off permanently. (Building, Breaker, Wiring)

https://www.youtube.com/watch?v=EcsYAjoRtFA



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL INSPECTION OF TEMPORARILY OUT OF USE UST SYSTEMS

- This form may be utilized to document inspection of temporarily out of use UST systems.
- Inspection is required by 10/5/2019 and every year (1) thereafter.
- Tanks must contain less than 1 inch fuel, corrosion protection must be maintained, and a site assessment must be performed within 1 year of becoming Temporarily Out of Use.
- Only adequate Soil Sampling and Analysis Results may be used for Permanent Closure of UST systems.

Date of Inspection

UST Facility			Person Conducting Test	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	Inspector's Signature	Date
UST Owner	UST Owner Permanent Mailing Address		UST Owner Phone Number or Email address	

TOSI UST System Inspection Results

Reason for Test: ☐ Routine Inspection ☐ Re-inspection (after failed inspection) ☐ Other:

	Component ID (tank, pipe)				
	Date component was taken out of service				
TANK	Tank Is Accessible?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
TANK	Tank contains less than 1 inch fuel?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
TANK	If no, how much fuel? (Inches)				
TANK	How much water is in the tank? (Inches)				
TANK	Vent pipes appear open and functional	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
PIPING	Piping is securely capped at the dispenser?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
PIPING	All piping and/or pipe terminations appear adequately protected from corrosion?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
PIPING	Method of Corrosion Protection used (Sump, Boots, Cathodic Protection, Not buried, NON-metallic, Other: (specify))				
	Pass or Fail (Visual Inspection)				

Cathodic Protection	List the date that the last cathodic protection survey was performed on (if applicable):	DATE
Cathodic Protection	Cathodic Protection Survey performed by (if applicable):	COMPANY / INDIVIDUAL
Cathodic Protection	60 Day Rectifier Log is being maintained?(if applicable) ☐ Yes ☐ No	BY WHOM?

SITE ASSESSMENT	Select One	Allowable Methods	Documentation Required	
SITE ASSESSMENT	☐	Soil Sampling and Analysis	Have results been sent to MDEQ?	☐ Yes ☐ No
SITE ASSESSMENT	☐	Water Sampling and Analysis	Have results been sent to MDEQ?	☐ Yes ☐ No
SITE ASSESSMENT	☐	Ground Water Monthly Monitoring *(Delays the requirement to perform site assessment.)*	Have all Suspected/Confirmed releases been reported to MDEQ?	☐ Yes ☐ No
		(Minimum of 1 month required.) Attach all monthly records to this form.		

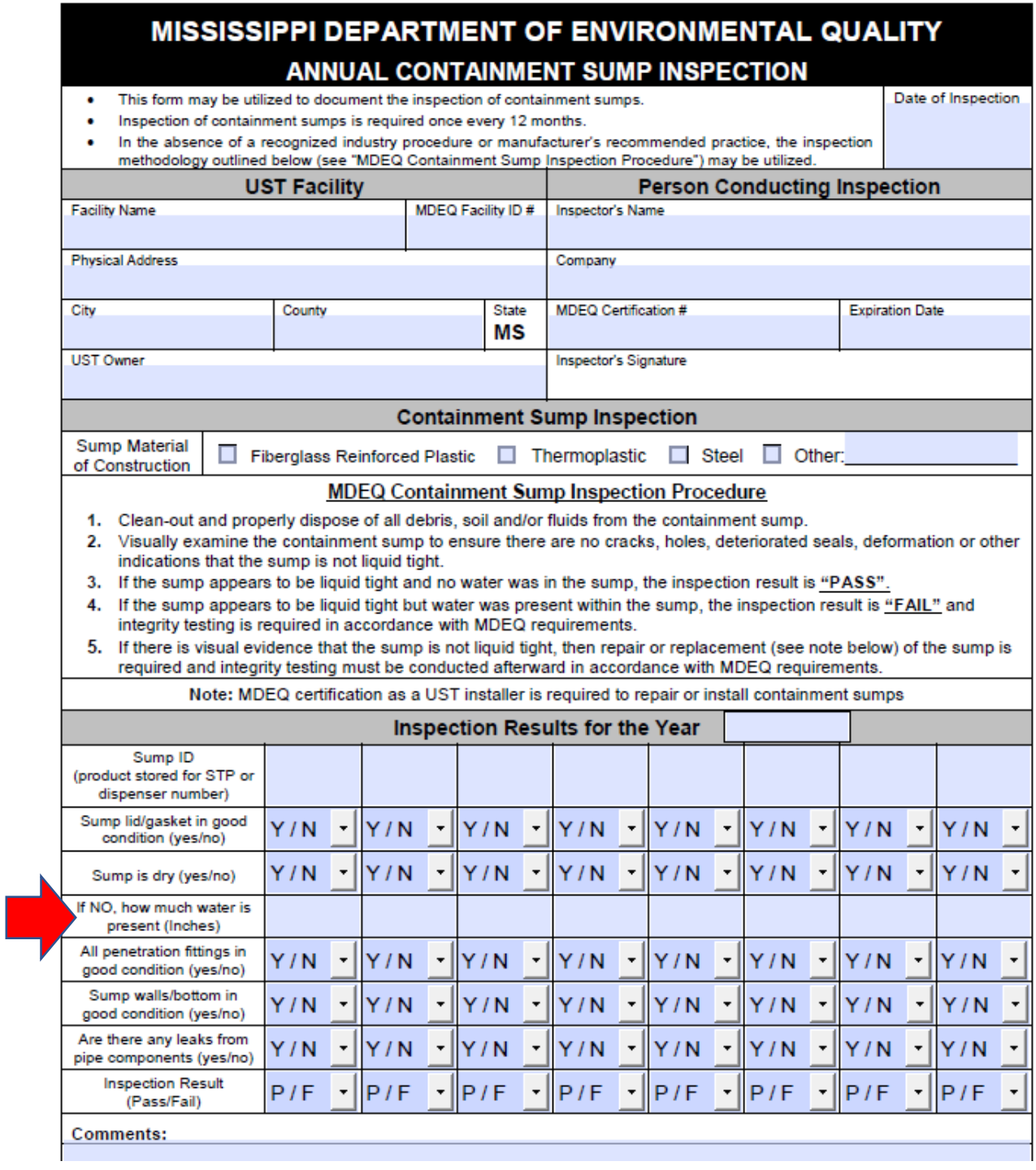
Comments:

Interstitial Monitoring

Common Question

- I can’t keep the water out.
  - What do it do?

- Fail annual sump inspection.
  - Required for all piping using Interstitial monitoring.
  - More than 1” water observed fails inspection
  - Very frequent water intrusion issues (if known by you) should also fail the inspection.
- Why?
  - DEQ inspectors look for routine water intrusion issues. (monthly records)
- Fail: Triggers need for sump integrity test.
- Never ending cycle.
  - Until tank owner fixes water intrusion issue



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

ANNUAL CONTAINMENT SUMP INSPECTION

- This form may be utilized to document the inspection of containment sumps.
- Inspection of containment sumps is required once every 12 months.
- In the absence of a recognized industry procedure or manufacturer's recommended practice, the inspection methodology outlined below (see "MDEQ Containment Sump Inspection Procedure") may be utilized.

Date of Inspection

UST Facility			Person Conducting Inspection	
Facility Name	MDEQ Facility ID #		Inspector's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Inspector's Signature	

Containment Sump Inspection

Sump Material of Construction: ☐ Fiberglass Reinforced Plastic ☐ Thermoplastic ☐ Steel ☐ Other:

MDEQ Containment Sump Inspection Procedure

1. Clean-out and properly dispose of all debris, soil and/or fluids from the containment sump.
2. Visually examine the containment sump to ensure there are no cracks, holes, deteriorated seals, deformation or other indications that the sump is not liquid tight.
3. If the sump appears to be liquid tight and no water was in the sump, the inspection result is **“PASS”**.
4. If the sump appears to be liquid tight but water was present within the sump, the inspection result is **“FAIL”** and integrity testing is required in accordance with MDEQ requirements.
5. If there is visual evidence that the sump is not liquid tight, then repair or replacement (see note below) of the sump is required and integrity testing must be conducted afterward in accordance with MDEQ requirements.

Note: MDEQ certification as a UST installer is required to repair or install containment sumps

Inspection Results for the Year

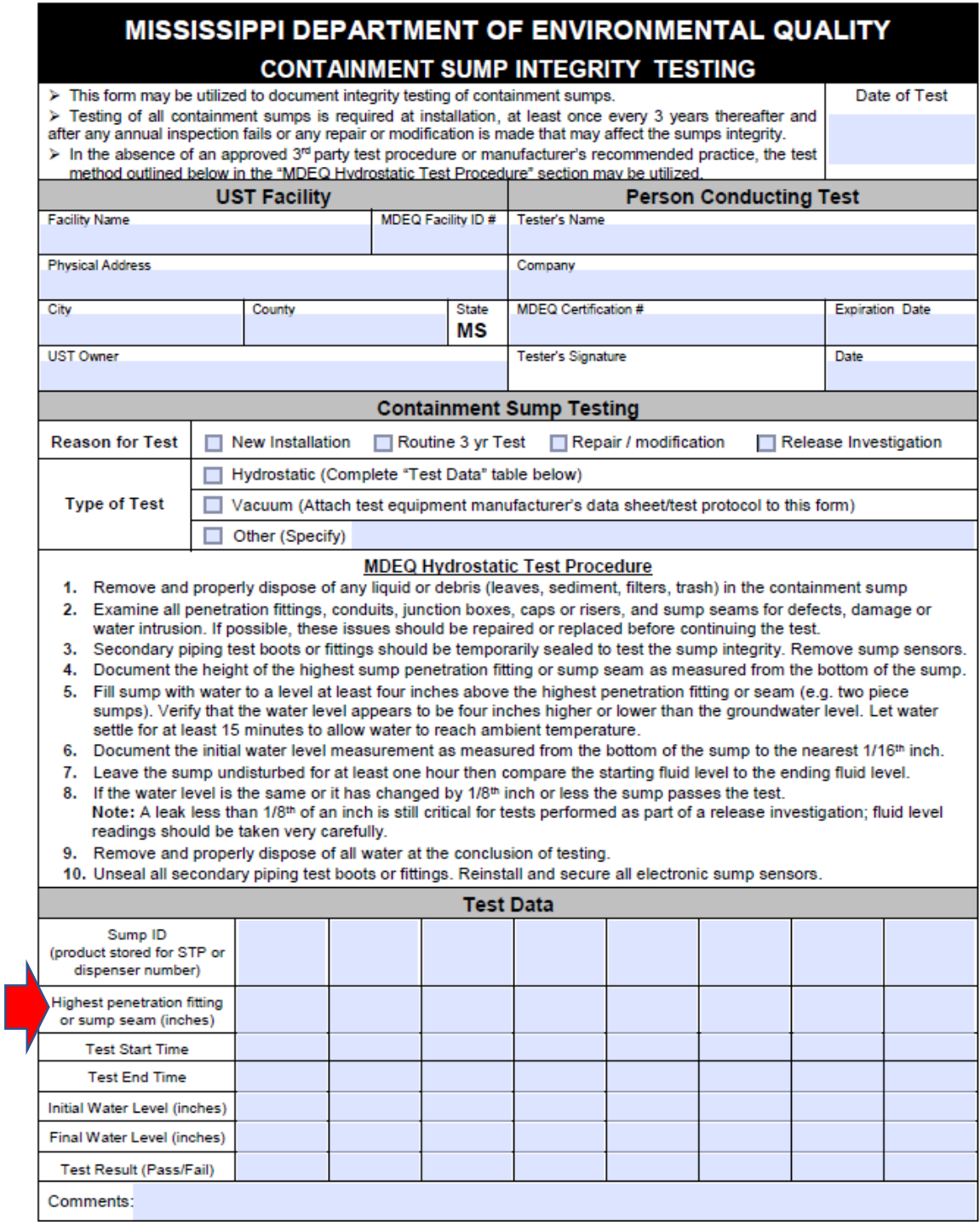
Sump ID (product stored for STP or dispenser number)								
Sump lid/gasket in good condition (yes/no)	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Sump is dry (yes/no)	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
If NO, how much water is present (Inches)								
All penetration fittings in good condition (yes/no)	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Sump walls/bottom in good condition (yes/no)	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Are there any leaks from pipe components (yes/no)	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Inspection Result (Pass/Fail)	P / F	P / F	P / F	P / F	P / F	P / F	P / F	P / F

Comments:

Containment Sump Integrity test

- Required when?
  - By 10/5/2021 and every 3 years thereafter
  - At installation of sump or repair of sump
  - When annual inspection indicates Fail.
  - When DEQ requests it:
    - Fuel observed in sump – release investigation
    - Significant signs of water intrusion

- Hydrostatic test
  - Fluid level should be 4” above top of fitting or sump seam. (requires documentation)
  - Fluid level should be 4” higher than groundwater. (no documentation required)



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

CONTAINMENT SUMP INTEGRITY TESTING

- This form may be utilized to document integrity testing of containment sumps.
- Testing of all containment sumps is required at installation, at least once every 3 years thereafter and after any annual inspection fails or any repair or modification is made that may affect the sumps integrity.
- In the absence of an approved 3rd party test procedure or manufacturer's recommended practice, the test method outlined below in the "MDEQ Hydrostatic Test Procedure" section may be utilized.

Date of Test

UST Facility			Person Conducting Test	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	Date

Containment Sump Testing

Reason for Test	☐ New Installation ☐ Routine 3 yr Test ☐ Repair / modification ☐ Release Investigation
Type of Test	☐ Hydrostatic (Complete "Test Data" table below)
	☐ Vacuum (Attach test equipment manufacturer's data sheet/test protocol to this form)
	☐ Other (Specify)

MDEQ Hydrostatic Test Procedure

1. Remove and properly dispose of any liquid or debris (leaves, sediment, filters, trash) in the containment sump
2. Examine all penetration fittings, conduits, junction boxes, caps or risers, and sump seams for defects, damage or water intrusion. If possible, these issues should be repaired or replaced before continuing the test.
3. Secondary piping test boots or fittings should be temporarily sealed to test the sump integrity. Remove sump sensors.
4. Document the height of the highest sump penetration fitting or sump seam as measured from the bottom of the sump.
5. Fill sump with water to a level at least four inches above the highest penetration fitting or seam (e.g. two piece sumps). Verify that the water level appears to be four inches higher or lower than the groundwater level. Let water settle for at least 15 minutes to allow water to reach ambient temperature.
6. Document the initial water level measurement as measured from the bottom of the sump to the nearest 1/16th inch.
7. Leave the sump undisturbed for at least one hour then compare the starting fluid level to the ending fluid level.
8. If the water level is the same or it has changed by 1/8th inch or less the sump passes the test.
   Note: A leak less than 1/8th of an inch is still critical for tests performed as part of a release investigation; fluid level readings should be taken very carefully.
9. Remove and properly dispose of all water at the conclusion of testing.
10. Unseal all secondary piping test boots or fittings. Reinstall and secure all electronic sump sensors.

Test Data

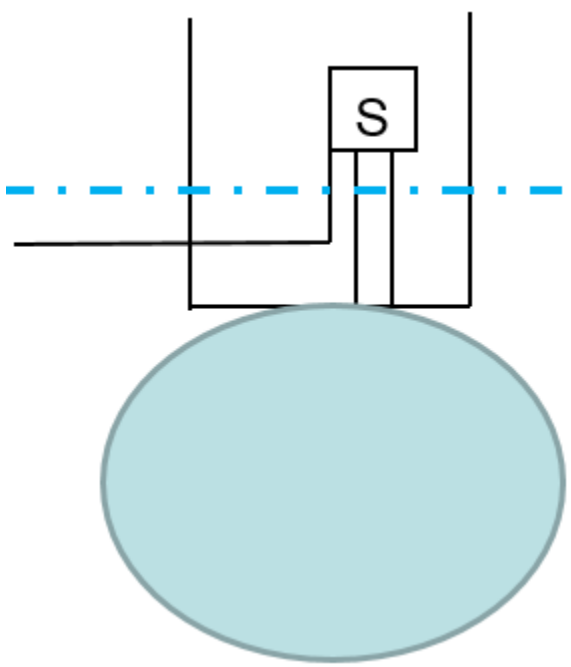
Sump ID (product stored for STP or dispenser number)								
Highest penetration fitting or sump seam (inches)								
Test Start Time								
Test End Time								
Initial Water Level (inches)								
Final Water Level (inches)								
Test Result (Pass/Fail)								

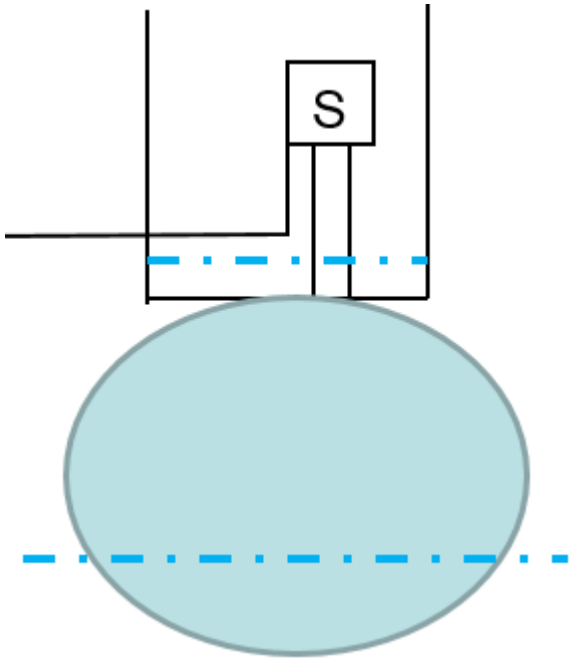
Comments:

Containment Sump Integrity test

4 inches above groundwater? What's the point?

- Goal is to detect slow leaks not easily visible
- If no difference in water level
  - Leak won't be seen.
- Small difference
  - Leak may not be seen. < 4”
- The greater the difference
  - The quicker the leak will be seen. > 4”
  - Can help catch slower leaks.



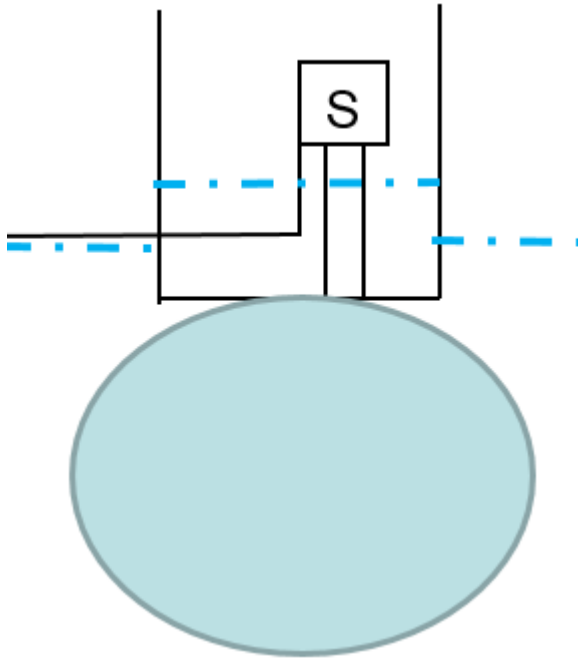


Containment Sump Integrity test

How do I do determine GW level?

- How do you determine it?
  - Monitoring wells. (preferable)
  - Water level in sump when you first open it up. (assumes water levels has equalized out)
- If water level is equal to GW level when you open sump up, you can bet that sump is leaking. Trick is how do you detect it?
  - Use higher difference.

    (Using more than 4” is okay. 4” is the minimum)
- Hydro test requirements:
  - Minimum 4” above fitting or seam.
  - Minimum 4” difference to GW level.

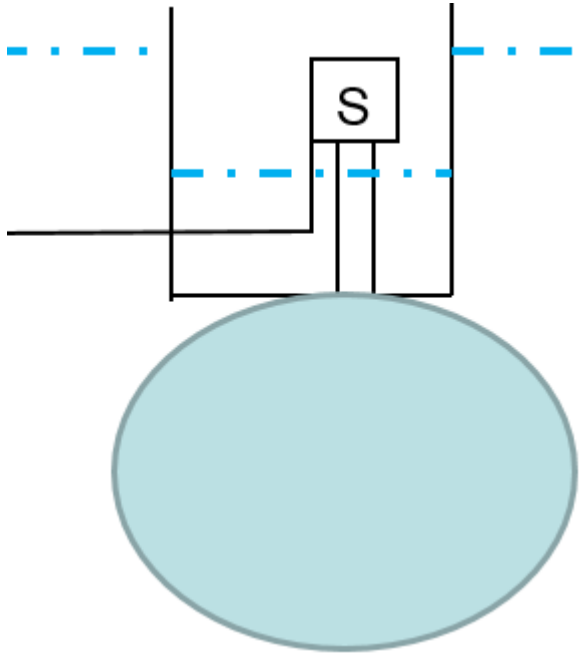


Containment Sump Integrity test

Underfill hydro test?

- In some cases you can't test 4" above GW level.
- It is acceptable to use underfill test.
- Underfill hydro test requirements:
  - Need to document it in comments on form:
    - Why you did it.
    - Why you couldn't do traditional hydro test.
  - Have to have some water in sump.
    - To determine if fluid level does change.
    - Looking for 1/8 inch INCREASE in water level.

      (Not traditional 1/8 inch decrease)



- Remember "Greater the difference" = "Better Test"

Containment Sump Integrity test

Let's be clear.

- Most sites in MS can us traditional hydro test.
- Underfill method should only be used in extreme conditions.
  - Water “confirmed” as being right below concrete.

Ex. Of not appropriate use.

- 3 STP sumps & 3 dispenser sumps bone dry.
- 3 dispenser sump completely full of water when you open them.
- Only MW on site is at tank bed and it is bone dry.

- Underfill method should NOT be used on the 3 sumps full of water.
  - Likely NOT appropriate since well at tank is dry.

Containment Sump Hydrostatic Integrity test

May easily take over 1 hr to complete… why?

- Ideally – you will seal up pipe interstice and it will be tight. Test fluid level in sump won't fluctuate by much.
- More commonly – pipe interstice won't seal up tight. What happens then?
  - Water travels through pipe interstices to other sumps.
  - The water levels will try to equalize out between all sumps connected by pipe interstice.
  - May take many hours for the test water to equalize between sumps.
  - Loss or Gain of 1/8 inch per hr is your Pass / fail criteria in MS.
  - Just because a sump passes 1/8 inch per hr doesn't mean you won't have water intrusion issues monthly.

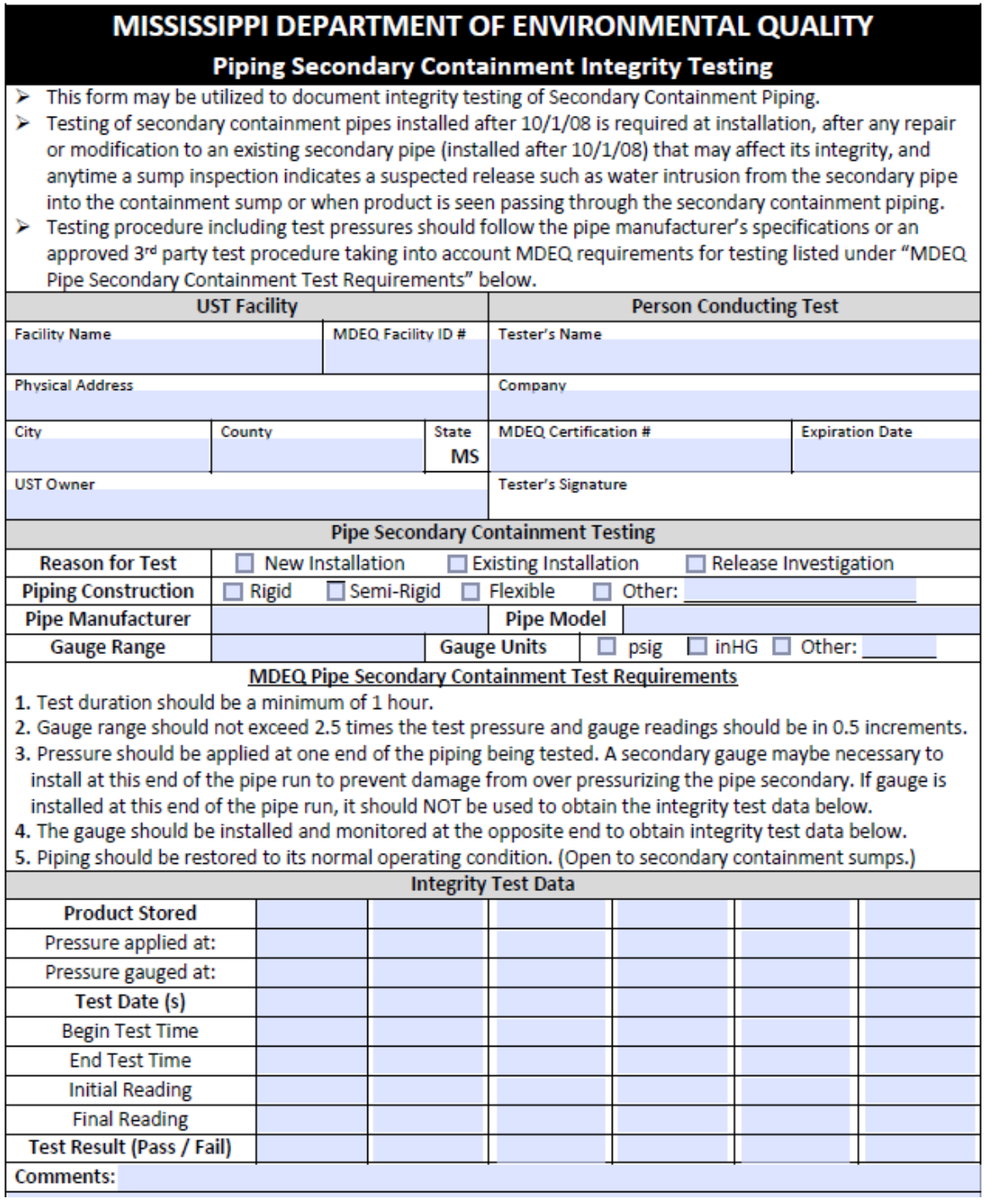
Containment Sump Integrity test

Update on common questions:

- PMA – low level testing. – Not approved.
- MDEQ allowance for water disposal on site. – Not approved.
- Dri Sump – Not approved for sites with water above sump bottoms.

Pipe Interstice Test Form

- Required for:
  - New install or repaired pipe IT
  - Piping NOT sloped to a containment sump by 10/5/2021 and every 3 years thereafter.
- Ex. OPW loop system
- Regs require:
  - Line Tightness Test. (3 year)
  - Pipe secondary integrity test. (3 year)



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Piping Secondary Containment Integrity Testing

- This form may be utilized to document integrity testing of Secondary Containment Piping.
- Testing of secondary containment pipes installed after 10/1/08 is required at installation, after any repair or modification to an existing secondary pipe (installed after 10/1/08) that may affect its integrity, and anytime a sump inspection indicates a suspected release such as water intrusion from the secondary pipe into the containment sump or when product is seen passing through the secondary containment piping.
- Testing procedure including test pressures should follow the pipe manufacturer's specifications or an approved 3rd party test procedure taking into account MDEQ requirements for testing listed under "MDEQ Pipe Secondary Containment Test Requirements" below.

UST Facility			Person Conducting Test	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State: MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	

Pipe Secondary Containment Testing

Reason for Test	☐ New Installation ☐ Existing Installation ☐ Release Investigation		
Piping Construction	☐ Rigid ☐ Semi-Rigid ☐ Flexible ☐ Other:		
Pipe Manufacturer		Pipe Model	
Gauge Range		Gauge Units	☐ psig ☐ inHG ☐ Other:

MDEQ Pipe Secondary Containment Test Requirements

1. Test duration should be a minimum of 1 hour.
2. Gauge range should not exceed 2.5 times the test pressure and gauge readings should be in 0.5 increments.
3. Pressure should be applied at one end of the piping being tested. A secondary gauge maybe necessary to install at this end of the pipe run to prevent damage from over pressurizing the pipe secondary. If gauge is installed at this end of the pipe run, it should NOT be used to obtain the integrity test data below.
4. The gauge should be installed and monitored at the opposite end to obtain integrity test data below.
5. Piping should be restored to its normal operating condition. (Open to secondary containment sumps.)

Integrity Test Data

Product Stored						
Pressure applied at:						
Pressure gauged at:						
Test Date (s)						
Begin Test Time						
End Test Time						
Initial Reading						
Final Reading						
Test Result (Pass / Fail)						

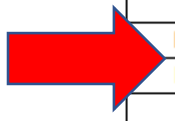
Comments:

Pipe Not Sloped to Containment Sump

Examples (NOT limited to loop system only)

Pipe Interstice Test Form

- Continuity is tested on form:
  - Pressure applied at: (STP sump)
  - Pressure gauged at: (Disp 9/10)
- Pressure should not be applied and gauged at the same location.
- If you don't see pressure increase at gauging end, you
  - Have a large hole
  - Interstice is blocked somewhere.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Piping Secondary Containment Integrity Testing

- This form may be utilized to document integrity testing of Secondary Containment Piping.
- Testing of secondary containment pipes installed after 10/1/08 is required at installation, after any repair or modification to an existing secondary pipe (installed after 10/1/08) that may affect its integrity, and anytime a sump inspection indicates a suspected release such as water intrusion from the secondary pipe into the containment sump or when product is seen passing through the secondary containment piping.
- Testing procedure including test pressures should follow the pipe manufacturer's specifications or an approved 3rd party test procedure taking into account MDEQ requirements for testing listed under "MDEQ Pipe Secondary Containment Test Requirements" below.

UST Facility			Person Conducting Test	
Facility Name	MDEQ Facility ID #		Tester's Name	
Physical Address			Company	
City	County	State: MS	MDEQ Certification #	Expiration Date
UST Owner			Tester's Signature	

Pipe Secondary Containment Testing

Reason for Test	☐ New Installation ☐ Existing Installation ☐ Release Investigation		
Piping Construction	☐ Rigid ☐ Semi-Rigid ☐ Flexible ☐ Other:		
Pipe Manufacturer		Pipe Model	
Gauge Range		Gauge Units	☐ psig ☐ inHG ☐ Other:

MDEQ Pipe Secondary Containment Test Requirements

1. Test duration should be a minimum of 1 hour.
2. Gauge range should not exceed 2.5 times the test pressure and gauge readings should be in 0.5 increments.
3. Pressure should be applied at one end of the piping being tested. A secondary gauge maybe necessary to install at this end of the pipe run to prevent damage from over pressurizing the pipe secondary. If gauge is installed at this end of the pipe run, it should NOT be used to obtain the integrity test data below.
4. The gauge should be installed and monitored at the opposite end to obtain integrity test data below.
5. Piping should be restored to its normal operating condition. (Open to secondary containment sumps.)

Integrity Test Data

Product Stored						
Pressure applied at:						
Pressure gauged at:						
Test Date (s)						
Begin Test Time						
End Test Time						
Initial Reading						
Final Reading						
Test Result (Pass / Fail)						

Comments:

Pipe installation issues

(Why pressurize and gauge at opposite ends?)

- Restrictions due to improper installation.
- Cross over tube fittings may or may not be installed properly. Do NOT assume!
- Why should constant pressure gauges be used?

Is the pipe interstice open?

No Cross over tubes

- Separate sections of piping.
- One end must be open.
- Open to include:
  - Valve stem removed.
  - Boot slid back
  - Boot clamps loosened so it spins easily.
  - Cross over tubes / fittings in place with tube cut.
- STP end must ALWAYS be open.

Pipe Interstice testing

(If we cant see how it was possibly tested Properly were going to question the results)

Factory Installed fitting

Looks good.

Same penetration fitting.
Factory plug not removed.

Not Tested Properly.

Same penetration fitting.
Factory plug resin covered.

Not Tested Properly.

UPP fitting. Appears open right?
It's not. Clear plastic covering it.

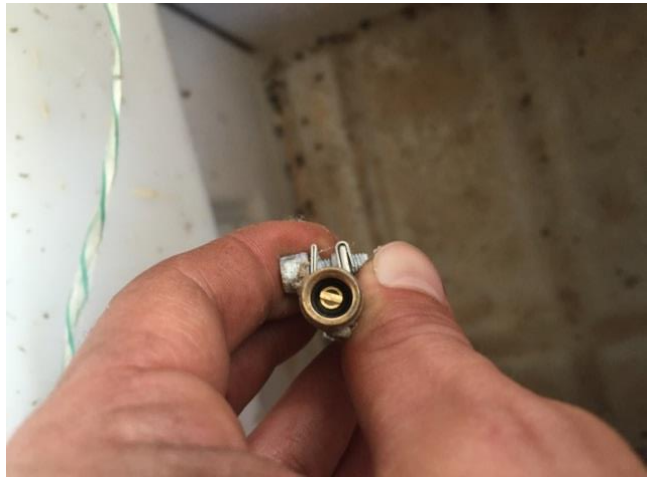
Designed to be at end of pipe run.
Did they test IT properly?

Pipe Interstice testing

(If we cant see how it was possibly tested at all we may reject the results)

Is the pipe interstice open?

Cross Over Tubes



- Cross over tube joins multiple sections of piping into a run.
- Both ends of a pipe run must be open.
  - Increase quickness of leak detection
  - If there is a restriction in the tube you improve chances of catching the leak.
- STP end must ALWAYS be open.

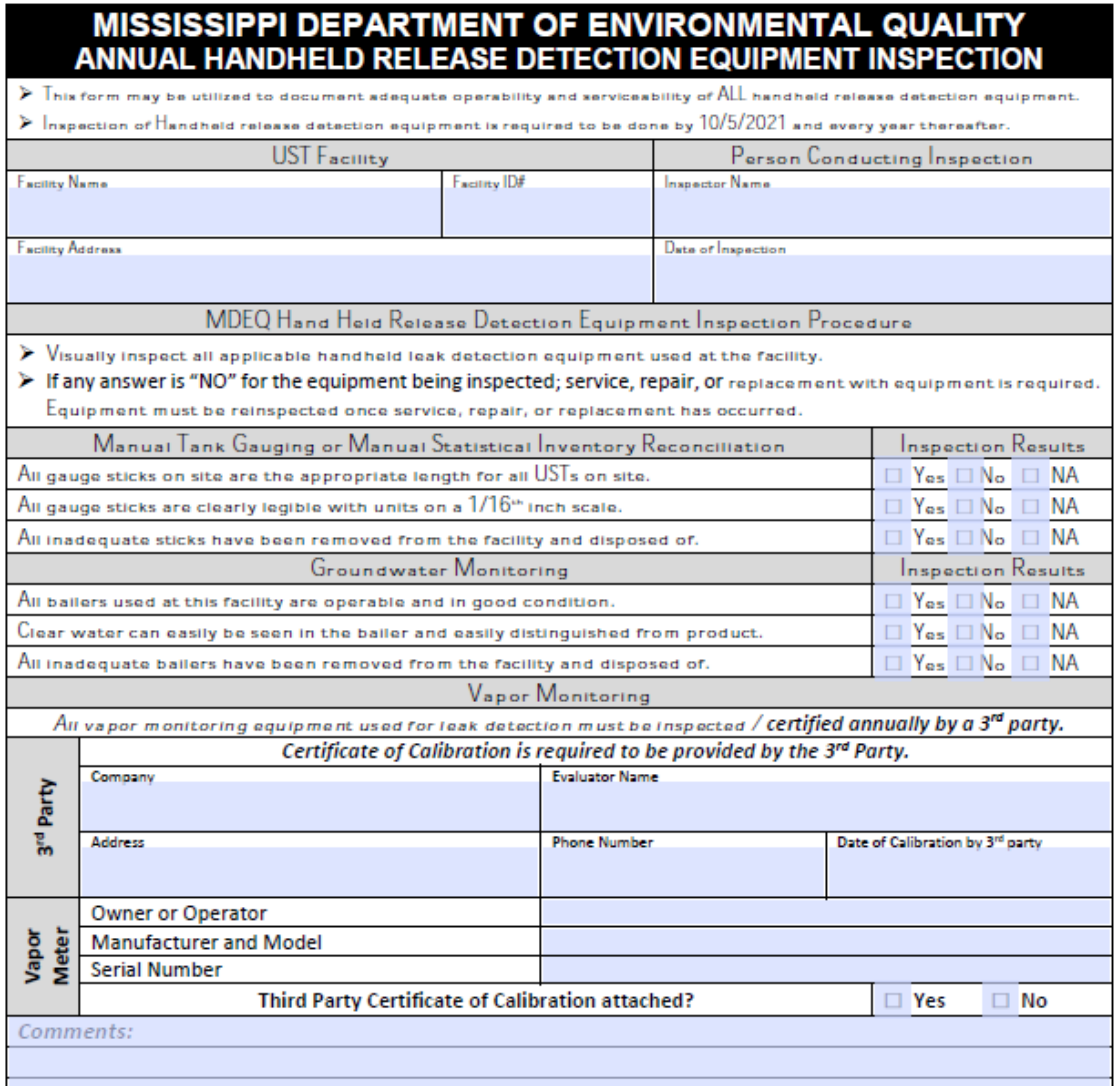
Why must STP end always be open?

- It is the lowest point.

- MDEQ has found several pipe interstices:
  - Closed at the STP.
  - Covering up pipe secondary issues.
    - Water intrusion through pipe interstice.

Annual Handheld Release Detection Equipment Inspection

- Due by 10/5/2021.
- If you do monthly GW / Vapor monitoring for your clients.
  - Fill one out for YOUR equipment. Provide copy to tank owner with annual test reports.
- If you have clients who do their own GW / Vapor monitoring:
  - You can do this inspection on their equipment.
  - Tank Owner can do it on their own equipment.
- If you perform annual tests at an SIR site.
  - Check their sticks. Pass / fail accordingly.
  - Tank Owner can do it on their own equipment.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
ANNUAL HANDHELD RELEASE DETECTION EQUIPMENT INSPECTION

- This form may be utilized to document adequate operability and serviceability of ALL handheld release detection equipment.
- Inspection of Handheld release detection equipment is required to be done by 10/5/2021 and every year thereafter.

UST Facility		Person Conducting Inspection
Facility Name	Facility ID#	Inspector Name
Facility Address		Date of Inspection

MDEQ Hand Held Release Detection Equipment Inspection Procedure

- Visually inspect all applicable handheld leak detection equipment used at the facility.
- If any answer is "NO" for the equipment being inspected; service, repair, or replacement with equipment is required. Equipment must be reinspected once service, repair, or replacement has occurred.

Manual Tank Gauging or Manual Statistical Inventory Reconciliation	Inspection Results
All gauge sticks on site are the appropriate length for all USTs on site.	☐ Yes ☐ No ☐ NA
All gauge sticks are clearly legible with units on a 1/16th inch scale.	☐ Yes ☐ No ☐ NA
All inadequate sticks have been removed from the facility and disposed of.	☐ Yes ☐ No ☐ NA
Groundwater Monitoring	**Inspection Results**
All bailers used at this facility are operable and in good condition.	☐ Yes ☐ No ☐ NA
Clear water can easily be seen in the bailer and easily distinguished from product.	☐ Yes ☐ No ☐ NA
All inadequate bailers have been removed from the facility and disposed of.	☐ Yes ☐ No ☐ NA

Vapor Monitoring

All vapor monitoring equipment used for leak detection must be inspected / certified annually by a 3rd party.

3rd Party	*Certificate of Calibration is required to be provided by the 3rd Party.*		
	Company	Evaluator Name	
	Address	Phone Number	Date of Calibration by 3rd party
Vapor Meter	Owner or Operator		
	Manufacturer and Model		
	Serial Number		
	Third Party Certificate of Calibration attached?	☐ Yes	☐ No

Comments:

Annual Handheld Release Detection Equipment Inspection

- May seem pointless
- Fresh fuel takes time to darken.

Monthly Walk through Inspections

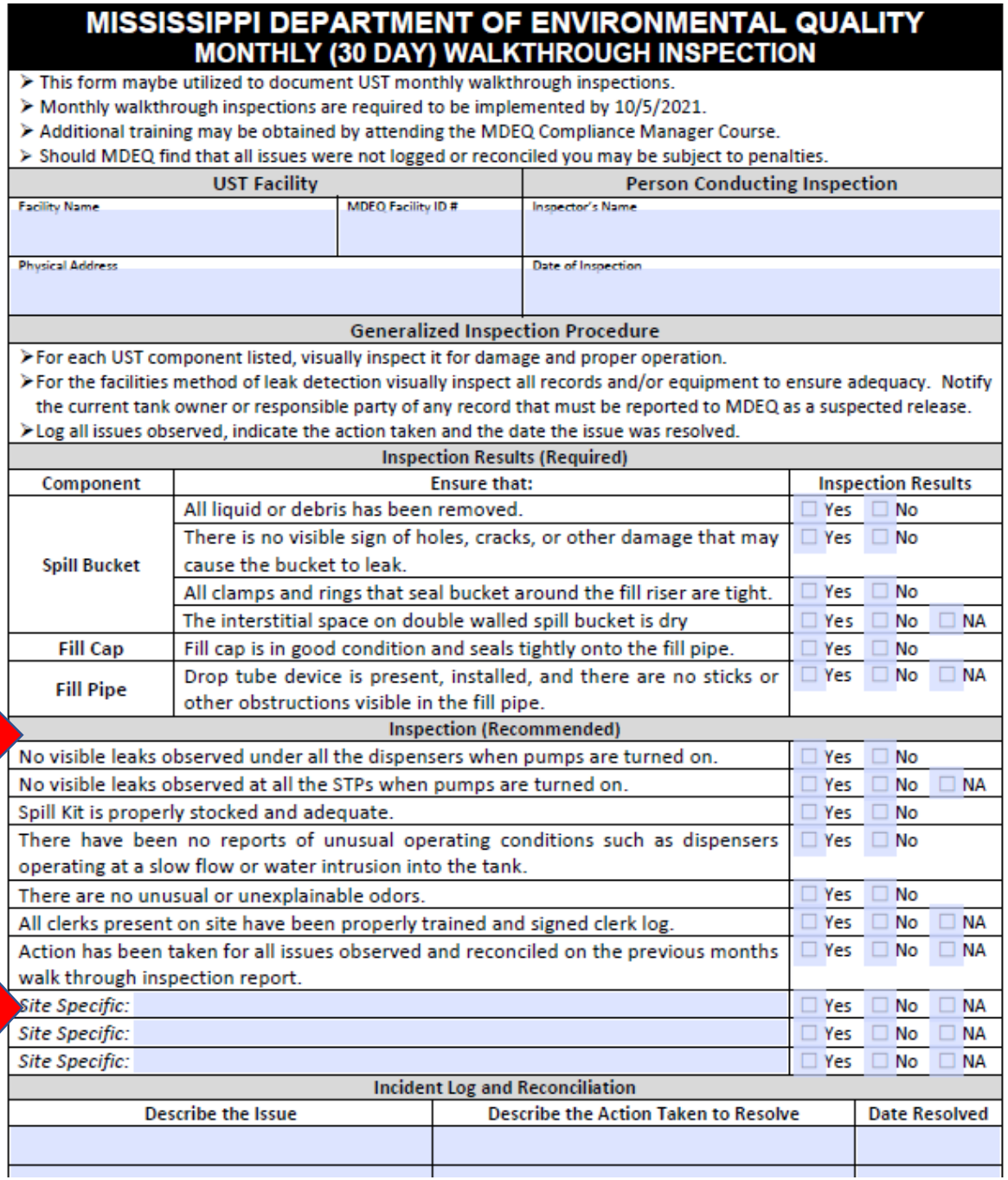
- Not every leak will be caught using typical leak detection methods.
- EPA realizes this (or so I think)

- The push for the tried and true:
  - Monthly Maintenance Walk throughs
  - Goes a long way

Monthly Walk through Inspections

- Recommended section is
  - Highly recommended
- Site Specific examples:
  - Check tanks for water or phase
  - Check labeling / paint on fuel lids
  - Break-a-ways in good condition?
  - STP cycling ON / OFF properly?

- Doing more IS the only way to catch leaks that normal leak detection methods will NOT catch.



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
MONTHLY (30 DAY) WALKTHROUGH INSPECTION

- This form maybe utilized to document UST monthly walkthrough inspections.
- Monthly walkthrough inspections are required to be implemented by 10/5/2021.
- Additional training may be obtained by attending the MDEQ Compliance Manager Course.
- Should MDEQ find that all issues were not logged or reconciled you may be subject to penalties.

UST Facility		Person Conducting Inspection
Facility Name	MDEQ Facility ID #	Inspector's Name
Physical Address		Date of Inspection

Generalized Inspection Procedure

- For each UST component listed, visually inspect it for damage and proper operation.
- For the facilities method of leak detection visually inspect all records and/or equipment to ensure adequacy. Notify the current tank owner or responsible party of any record that must be reported to MDEQ as a suspected release.
- Log all issues observed, indicate the action taken and the date the issue was resolved.

Inspection Results (Required)

Component	Ensure that:	Inspection Results
Spill Bucket	All liquid or debris has been removed.	☐ Yes ☐ No
	There is no visible sign of holes, cracks, or other damage that may cause the bucket to leak.	☐ Yes ☐ No
	All clamps and rings that seal bucket around the fill riser are tight.	☐ Yes ☐ No
	The interstitial space on double walled spill bucket is dry	☐ Yes ☐ No ☐ NA
Fill Cap	Fill cap is in good condition and seals tightly onto the fill pipe.	☐ Yes ☐ No
Fill Pipe	Drop tube device is present, installed, and there are no sticks or other obstructions visible in the fill pipe.	☐ Yes ☐ No ☐ NA

Inspection (Recommended)

No visible leaks observed under all the dispensers when pumps are turned on.	☐ Yes ☐ No
No visible leaks observed at all the STPs when pumps are turned on.	☐ Yes ☐ No ☐ NA
Spill Kit is properly stocked and adequate.	☐ Yes ☐ No
There have been no reports of unusual operating conditions such as dispensers operating at a slow flow or water intrusion into the tank.	☐ Yes ☐ No
There are no unusual or unexplainable odors.	☐ Yes ☐ No
All clerks present on site have been properly trained and signed clerk log.	☐ Yes ☐ No ☐ NA
Action has been taken for all issues observed and reconciled on the previous months walk through inspection report.	☐ Yes ☐ No ☐ NA
Site Specific:	☐ Yes ☐ No ☐ NA
Site Specific:	☐ Yes ☐ No ☐ NA
Site Specific:	☐ Yes ☐ No ☐ NA

Incident Log and Reconciliation

Describe the Issue	Describe the Action Taken to Resolve	Date Resolved

Monthly Walk through Inspections

- Requires review of leak detection records.
- This can be done by you.
- Your obligation is to:

  Notify the tank owner of issues.
- Tank owner is to:
  - report in 24 hrs to DEQ.
  - Take action to address or fix the issue.

Inspection of Leak Detection Equipment and Documents (Required)	Facility ID#:	
All Methods		Inspection Results
I reviewed all applicable reports, tests, or equipment related to leak detection at this facility.		☐ Yes ☐ No
I notified the current Tank Owner or Responsible Party in writing of any leak detection record that must be reported to MDEQ as a suspected release.		☐ Yes ☐ No ☐ NA
Method Used	**Ensure that:**	
Monitoring Wells	All necessary monitoring wells were checked and observations properly recorded.	☐ Yes ☐ No ☐ NA
Automatic Tank Gauging	The ATG is operating with no alarms or unusual operating conditions related to leak detection.	☐ Yes ☐ No ☐ NA
	0.2 gph leak tests indicate passing results.	☐ Yes ☐ No ☐ NA
	A passing 0.2 gph leak test was obtained (within 24 hrs) of all failing or inconclusive 0.2 gph leak tests.	☐ Yes ☐ No ☐ NA
Electronic Line Leak Detectors	The ATG is operating with no alarms or unusual operating conditions related to pipe leak detection	☐ Yes ☐ No ☐ NA
	All 0.2 gph pipe leak tests show passing results.	☐ Yes ☐ No ☐ NA
	A passing 0.2 gph leak test was obtained (within 24 hrs) of all failing/inconclusive 0.2 gph leak tests.	☐ Yes ☐ No ☐ NA
Visual Interstitial Monitoring	Report indicates that there is no liquid observed.	☐ Yes ☐ No ☐ NA
	All water observed has been removed.	☐ Yes ☐ No ☐ NA
	All fuel observed has been removed (Need to Report to MDEQ)	☐ Yes ☐ No ☐ NA
Electronic Interstitial Monitoring	Monthly sensor status report indicates all sensors are not in alarm and functioning properly.	☐ Yes ☐ No ☐ NA
	All alarms for the month have been reconciled and logged on the monthly Electronic Interstitial monitoring form.	☐ Yes ☐ No ☐ NA
	All water observed has been removed.	☐ Yes ☐ No ☐ NA
	All fuel observed has been removed (Need to Report to MDEQ)	☐ Yes ☐ No ☐ NA
Statistical Inventory Reconciliation	Tank checked for water, no water is present, and fuel levels are being properly recorded.	☐ Yes ☐ No ☐ NA
	Fuel levels were submitted to a 3rd party vendor for analysis.	☐ Yes ☐ No ☐ NA
	The previous month's record indicates passing results.	☐ Yes ☐ No ☐ NA
Other:		☐ Yes ☐ No ☐ NA

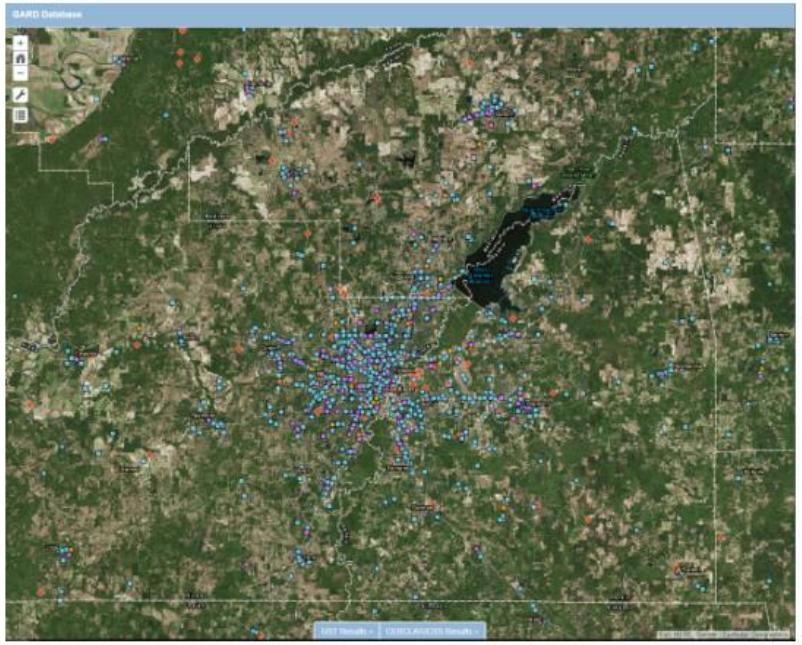
Additional Incident Log and Reconciliation		
Describe the Issue	Describe the Action Taken to Resolve	Date Resolved

UST Technical Regulation Changes
Other

- 10/5/18
  - Cannot Install / Modify or Repair ball floats.
  - Tank owners required to report failures (all tests or monthly leak detection) within 24 hours if they can’t get a pass
  - Equipment failures – repairs required within 90 days.
    - To request extension, you “contractor” must request it

Muster Database

Interactive Map



Search for All UST Facilities

Online Reports

The following are selected reports you may view by selecting a report from the dropdown box, choosing the appropriate format type, and clicking the download button.

Select Report:
Scheduled Inspections

Select Format Type:
PortableDocFormat

Continue Download Reset

- http://muster.deq.state.ms.us/musterweb/
- Use map to zoom in on sites to figure out Facility ID #
- Run reports – very useful

Online Reports

Powerful tools you should be using.

- Select Report:
  - Scheduled Inspections
  - Notification Form For Facility
  - Lust Status by Group
  - Inspection Compliance Requirements
  - Current Cap Summary
  - Facility & Owners in Violation

- Once selected most of these will pop up a spot to put in the Facility ID #

Notification form for facility

Figure out: Leak detection method, type of tank / pipe, capacity, permanently closed tanks.

Online Reports

The following are selected reports you may view by selecting a report from the dropdown box, choosing the appropriate format type, and clicking the download button.

Select Report:

Notification Form For Facility

Select Format Type:

PortableDocFormat

Continue Download

Reset

Facility ID: : 11935

Notification Form For Facility #11935

FACILITY ID NUMBER : 11935

OWNER'S ID : [redacted]

OWNERSHIP OF TANK(S):

[redacted]

Jackson, MS 39288

Owner Phone : (601[redacted]

LOCATION OF TANK(S):

Griffis Truck Stop
25357 Highway 330
Tillatoba, MS 38961

County : Yalobusha

Tank # 1 For Facility 11935

Status : Currently In Use **Capacity :** 20000 **Substance :** Diesel

Tank Material of Construction :

Epoxy Coated Steel
Cathodically Protected

Date Closed :
Closure Type :
Tank Installed : 09/01/1996
Spill Protected: Yes
Overfill Protected: Yes

Tank Release Detection:

Automatic Tank Gauging

Pipe # 1 For Tank # 1

Status : Currently In Use **Pipe Type :** Pressurized

Pipe Material of Construction :

Flexible Plastic
Double-Walled

Pipe Installed : 09/01/1996
Date Closed :
Type of Closure :

Pipe Release Detection:

Line Tightness Testing
Mechanical

Did the owner report those high vapors?

If its not listed here, probably not.

Online Reports

The following are selected reports you may view by selecting a report from the dropdown box, choosing the appropriate format type, and clicking the download button.

Select Report:

LUST Status Report By Status By Group

Select Format Type:

PortableDocFormat

Continue Download

Reset

Lust Status : Active

Group By : City

Leaking Underground Storage Tank List All with No Comments

Active LUST Sites by City

Page 1 of 197 12/9/19

Project Manager : John Traweek				
Facility ID: 7303	Owner	Location	Contractor	Last LDR:
Event # : 1	Dutch Oil Company PO Box 2323 Columbus, MS 39704 (662) 327-5202	Highway 45 Shell Highway 45 North - 708 High Extension Aberdeen, MS 39730		Last GWS: Last PTT: Active USTs 4 Start Date : 09/01/2016
Monroe Co.				
EUD p = 8				
Confirmed : 4/12/18				

Activities :	Start Date	Documents :	Due	Extension	Received	To Fin.
LDR Vapor Monitoring	12/5/19					

Inspection Compliance Requirements

Records MDEQ expects to see at the time of Inspection.

Note: These are NOT updated for new regs. It's based on current registration so if registration is not right this is not right for the site.

Online Reports

The following are selected reports you may view by selecting a report from the dropdown box, choosing the appropriate format type, and clicking the download button.

Select Report:

Inspection Compliance Requirements

Select Format Type:

PortableDocFormat

Continue Download

Reset

Facility ID: : 11935

UST Facility Inspection Compliance Requirements

Griffis Truck Stop, 25357 Highway 330, Tillatoba, MS, Facility ID #11935

The following records must be made available for our review at the time of the inspection:

* Automatic tank gauging records (Provide copies of the previous 12 months of 'leak test' records)

* Inspection of the automatic tank gauging system (Provide a copy of the last inspection of the automatic tank gauging system)

* Inspection of the overfill prevention devices (Provide a copy of the last inspection of the overfill prevention devices)

* Precision Tightness Test record for the piping (Provide a copy of the most recent precision tightness test for pipes)

* Testing of Shear valve operation (Provide a copy of the last record of shear valve operation testing)

* Testing of the automatic line leak detectors (Provide copies of the last two test records of automatic line leak detectors)

* Testing of the spill containment buckets (Provide a copy of the last test of the spill containment buckets)

* Testing of the tank cathodic protection system (Provide copy of the last test record of the cathodic protection system)

MDEQ Schedule Inspections

Pending means its definitely scheduled. MDEQ will be there. Be ready.
Scheduled means it's in the process of being scheduled. It's coming up but possibly not that day or time. Call your MDEQ regional inspector.

Online Reports

The following are selected reports you may view by selecting a report from the dropdown box, choosing the appropriate format type, and clicking the download button.

Select Report:
Scheduled Inspections

Select Format Type:
PortableDocFormat

Continue Download Reset

Scheduled Inspections

Sam McElveen

STATUS	OWNER NAME	ID	FACILITY	CITY	COUNTY	DATE	TIME
PENDING	Discount Zone LLC	11977	Discount Zone LLC	Picayune	Pearl River	12/10/2019	9:30
PENDING	Huong V Tran	6590	Asian Square	Picayune	Pearl River	12/10/2019	11:00
SCHEDULED	Dixie Properties LLC	13014	Dixie Depot # 1	Moss Point	Jackson	12/11/2019	9:30
PENDING	Brijesh V Patel	12092	Vrishab Inc	Moss Point	Jackson	12/11/2019	11:00
SCHEDULED	Keith And Vicki Rhodes	2401	Tiger Discount Gas	Biloxi	Harrison	12/12/2019	9:00
PENDING	Betty Domonousky	3083	Cruthirds Country Corner Store LLC	Ocean Springs	Jackson	12/12/2019	10:30
PENDING	Jenni Brown	12722	Cabin Store LLC	Wiggins	Stone	12/17/2019	9:30
PENDING	Hebert Properties LLC	744	Country Kwik-stop	Gulfport	Harrison	12/17/2019	11:00
PENDING	David Wells	7830	East Bank Convenience Store	Pascagoula	Jackson	12/18/2019	9:30
PENDING	Darpan Patel	4086	Mstar #1	Pascagoula	Jackson	12/18/2019	11:00
PENDING	Thompson Nguyen	9077	Big P Mini Mart	Long Beach	Harrison	12/19/2019	9:30
PENDING	Phuong T Dang	12411	P T Mini Mart	Ocean Springs	Jackson	12/26/2019	9:30
PENDING	Richard Harris	12245	Gulf Coast Express Mart	Ocean Springs	Jackson	12/26/2019	11:00
PENDING	Barry Broome	3080	Broome's #2	Ocean Springs	Jackson	12/26/2019	12:30
PENDING	Chay Kang	4329	Corner Mart	Moss Point	Jackson	12/31/2019	9:30
PENDING	Pilot Travel Centers LLC	4054	Pilot Travel Center #586	Moss Point	Jackson	12/31/2019	11:00
PENDING	Natalie N Koenenn	12906	Kodie's Junction	Kiln	Hancock	01/09/2020	9:30

CAP summary: Should list date of last known tests.

Not currently working.

Online Reports

The following are selected reports you may view by selecting a report from the dropdown box, choosing the appropriate format type, and clicking the download button.

Select Report:

Current CAP Summary Per Owner/Facility

Select Format Type:

Excel

Continue Download

Reset

Processing Year :	
Facility ID :	11935
Owner ID :	
Owner Name :	

UNDERGROUND STORAGE TANK FACILITY COMPLIANCE SUMMARY

According to our records, it is necessary for you to conduct the following tests and/or monitoring at the referenced facility. You must accomplish each of the listed tests and routine monitoring requirements to maintain compliance.

Compliance Assistance Program

FACILITY I.D. #

,

MDEQ

Facilities & Owners in Violation

Keep track of Deadlines. Contact the right MDEQ manager to figure out what to do.

Online Reports

The following are selected reports you may view by selecting a report from the dropdown box, choosing the appropriate format type, and clicking the download button.

Select Report:

Facilities & Owners In Violation with Details

Select Format Type:

PortableDocFormat

Download

Facilities & Owners in Violation

12/9/2019

Owner Name	Fac ID	Facility Name	OCE Status	Due Date	Override Date	Manager
50 Strong	7808	C & L Convenience Store	Red Tag	11/10/12	6/30/11	Scott Slater
84 GasExpress LLC	7976	84 Gasexpress LLC	Red Tag	10/25/19	12/2/19	Brandon St. Clair
A T & T Communicatic	10648	Gulfport Radio Relay Station (m	New	1/13/20		Brandon St. Clair
Abdul Rzaq Abdula	9850	Aiden Food & Fuel	2nd Notice	6/20/18	6/27/18	Scott Slater
Abdulaziz Saleh dba J	3757	JJ's EZ Stop	2nd Notice	8/8/18		Brandon St. Clair
Abdulhakim Ahmed	7543	NIAS Express	Red Tag	4/7/18	3/8/18	Scott Slater
Abdullah N Obaid	5605	Express Lane Dixon	2nd Notice	12/26/19		Brandon St. Clair
Adams County Board	12093	Adams County Sheriff's Office	2nd Notice	12/27/19		Brandon St. Clair
Adcox & Grayson Inc	12097	Adcox & Grayson Inc dba South	2nd Notice	12/27/19		Brandon St. Clair
Akwinder Kaur	12112	A B Food Mart	2nd Notice	4/18/18	6/17/18	Scott Slater
Algazali Family Inc	1085	Algazali Family Inc	Red Tag Pendi	11/2/19	11/14/19	Scott Slater
Alma Holman & Willa	2791	Holman's Gas Mart	Red Tag Pendi	2/27/19	4/6/19	Scott Slater
Alonzo Evans	7862	Speedway	Red Tag	7/8/15		Brandon St. Clair
Amaan Allahi And Sal	7554	B-quik 99	Red Tag	5/14/11		Scott Slater
Amandeep Singh	12647	Best Stop 6	Red Tag	12/21/19		Brandon St. Clair
Amarjit Singh	12683	Richi	2nd Notice	7/24/19	7/24/19	Scott Slater

Accessing Forms & Info

- https://www.mdeq.ms.gov/water/groundwater-assessment-and-remediation/underground-storage-tanks/

- Forms & Publications
- All other info

- If you choose to make your own forms:
  - At a minimum MDEQ needs to review and approve.
  - They should include all relevant questions included on MDEQ's form
  - For tests where MDEQ does not have a form, you should use the Manufacturers (Ex. Tank tightness tests)

Monthly Monitoring Tags

- Used by DEQ to see if your checking what your supposed to.
- Maybe used for:
  - Monthly monitoring
  - Annual testing
- Don’t take offence to if you see one.
- Integrity is difficult to enforce.
- We are doing you a favor by trying to.
- Watch for them. Follow instructions on cards.

Property of MDEQ

This is a test of your monthly monitoring at this location. ***To complete this test***:

1.) Please call Wesley McCain 662-832-7106 to report as found. (Leave voicemail if no one answers)
2.) Attach this tag to monthly monitoring report.

If you do neither of these, it may result in enforcement action being taken by MDEQ.

Thank you for your time and work completed.

Red Tagging

- Mistakes do happen.
- Some are completely avoidable.
- If they pose a significant risk
- MDEQ will red tag the tank or tank associated with the pipe.