Nothing Compares
NORTH CAROLINA

April 26, 2018

Department of Environmental Quality

Contractor Information Session for NC's Update UST Regulations

Topics

- SIR Performance Criteria
- USTs Used for Emergency Power Generation
- UST-27 – Monthly Walkthrough Inspections
- UST-22A – Overfill Operability Testing

Topics

- UST-22B – Annual Leak Detection Equipment Check
- UST-22C – Walkthrough of Sumps
- UST-6D/23A – Spill Bucket Integrity Testing
- UST-6F/23B – Containment Sump Integrity Testing

Statistical Inventory Reconciliation Performance Criteria

- Effective June 1, 2017
- Tank owners/operators must be able to report the SIR results within a 30-day monitoring period.
- We will require one result monthly. The results should be in the RPs hands within 30 days of the start of the coverage period.

USTs Used for Emergency Power Generation

- USTs and ALL associated piping installed prior to 11/1/07 are required to conduct release detection.

- Release detection requirements must be met by **October 13, 2018**

Questions?

- For Emergency Generator Questions, Contact
  - UST Section – 919-707-8171
  - Michael Phelps – 336-776-9684 or michael.phelps@ncdenr.gov

Form UST-27

- Monthly Walkthrough Inspections
  - Spill Containment
  - Leak Detection
  - Corrosion Protection

- First Walkthrough Inspection must be completed prior to **October 13, 2018**

UST-27

Insert Page

Monthly Walkthrough Inspections

- This form must be used to document the monthly walkthrough inspections. Only complete the sections that apply to your facility.
- Inspect the applicable items below for your site. If an item is not applicable, then choose **N/A**. Enter the month and day of the inspection below the month along with inspectors initials. If no problem is observed, then mark **P** (Pass). If a problem is observed, then mark **F** (Fail). If **Fail**, indicate what action was taken and date it was taken to repair the issue in the table at bottom of form or attach documentation of any repairs.
- Inspections may be conducted in accordance with PEI RP 900, "Recommended Practices for the Inspection and Maintenance of UST Systems".

UST FACILITY							
Facility ID		Facility Name					Year

By entering your name below, you certify, under penalty of law, that the inspection data provided on this form documents the UST system equipment was checked in accordance with 40 CFR 280.36 (as incorporated by 15A NCAC 2N .0407).

ALL TANKS		**Month/Day**						
		First Initial Last Name						
Spill Containment Manhole (Spill Bucket) If a UST system receives deliveries at an interval greater than every 30 days, then check prior to delivery.	No dirt, trash, water, or product in the spill-containment manhole							
	No cracks, bulges, or holes in the spill-containment manhole. For metal buckets, no significant corrosion/pitting							
	All clamps and rings that seal bucket around fill riser are tight							
	No obstructions inside the fill pipe.							
	Fill cap in good condition and seals tightly on fill pipe.							
	For double-walled spill prevention equipment with interstitial monitoring, check for a leak in the interstitial area.							
LEAK DETECTION								
Electronic	The power is on and console operational							

Form UST-27

Inspections may be conducted in accordance with:

- **PEI RP 900**, “Recommended Practices for the Inspection and Maintenance of UST Systems”.

Spill Containment

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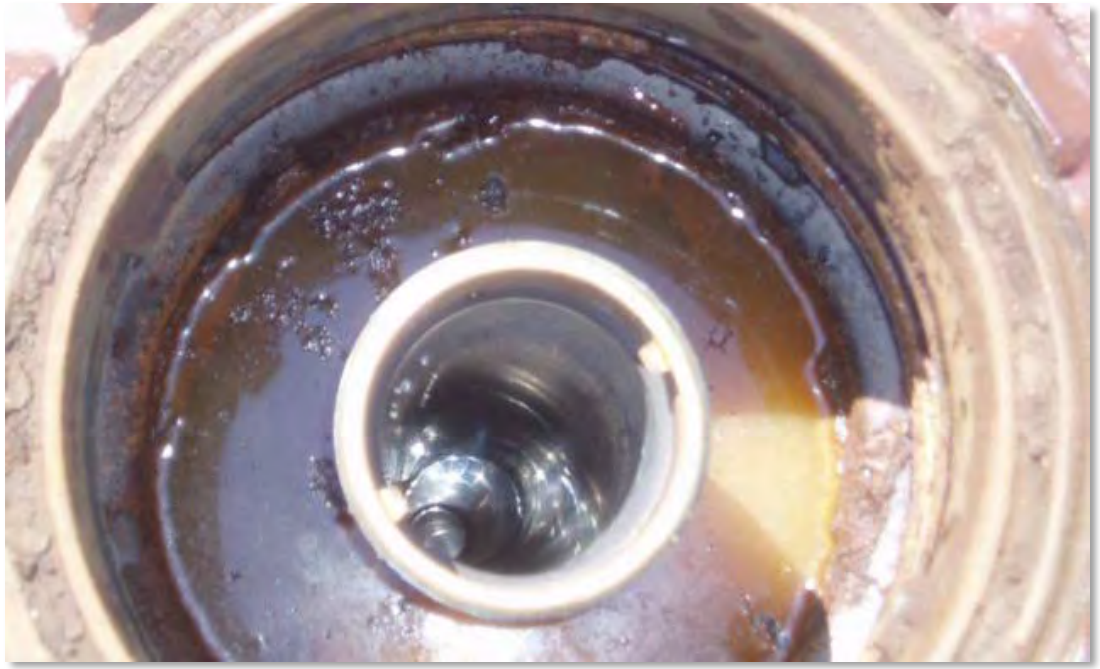
Spill Containment

- No dirt, trash, water, or product in the spill-containment manhole



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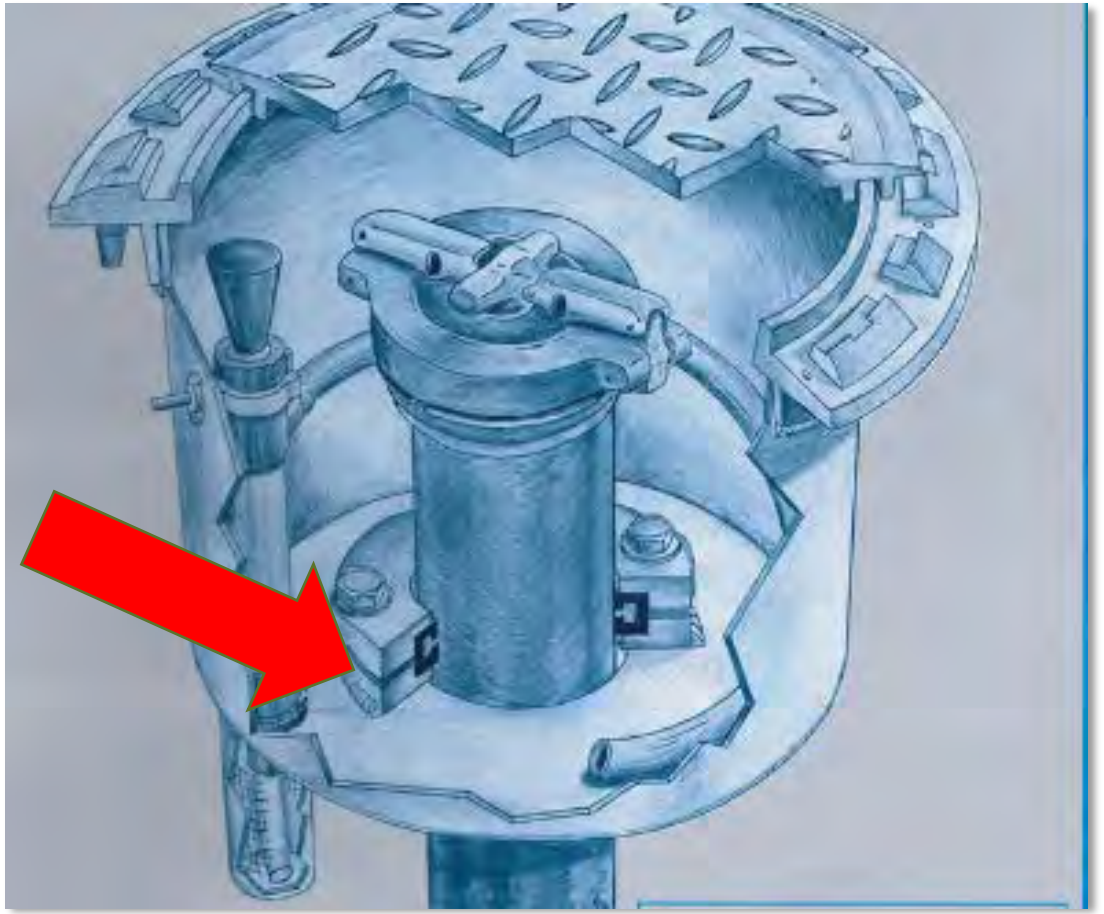
Spill Containment

- No cracks, bulges, or holes in the spill- containment manhole. For metal buckets, no significant corrosion/pitting

Spill Containment

- All clamps and rings that seal bucket around fill riser are tight



Spill Containment

- No obstructions inside the fill pipe.

Spill Containment

- Fill cap in good condition and seals tightly on fill pipe.

Spill Containment

- For double-walled spill prevention equipment with interstitial monitoring, check for a leak in the interstitial area.
  - Spill Buckets installed prior to November 1, 2007
    - Sensor Status report or Manual Monitoring
  - Spill Buckets installed after November 1, 2007
    - Sensor Status report AND Alarm History report

Spill Containment

- If a UST system receives deliveries at an interval greater than every 30 days, then check prior to delivery.

Leak Detection

- Electronic Monitoring Console
- Automatic Tank Gauge (ATG)
- Interstitial Monitoring – Electronic & Manual for Tanks and Piping
- Statistical Inventory Reconciliation (SIR)
- Other – Manual Tank Gauging, Vapor Monitoring, Groundwater Monitoring

Leak Detection

- Electronic Monitoring Console
  - Has power, No Warning or Alarm lights flashing, Printer has paper and functions.

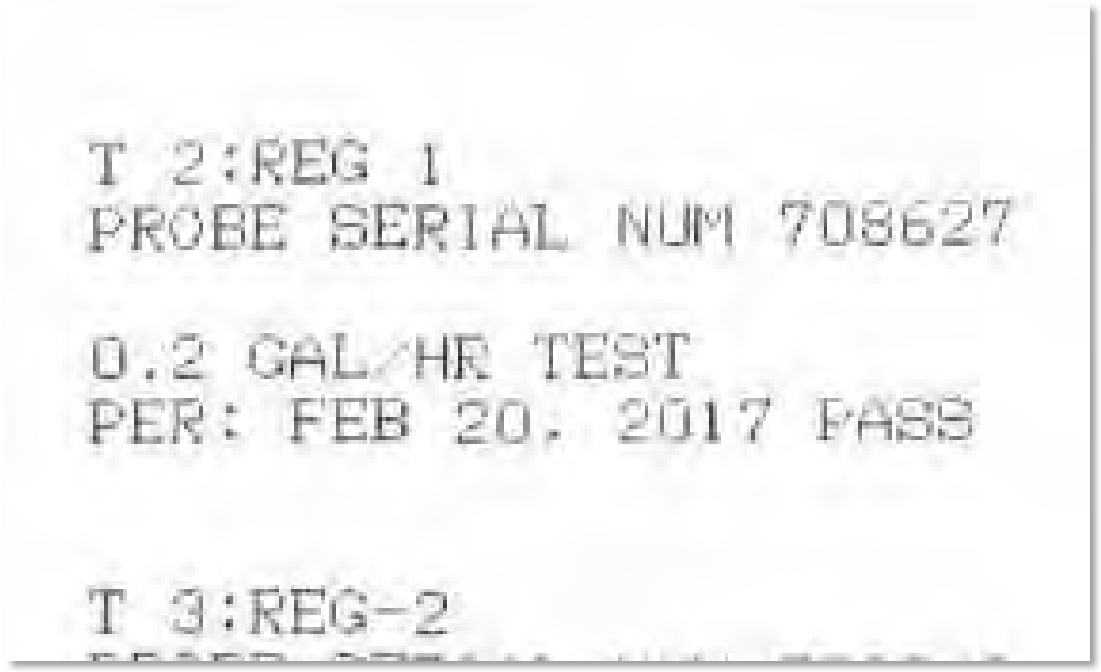
Leak Detection

Department of Environmental Quality

Leak Detection

- Automatic Tank Gauge (ATG)
  - Liquid Measurements taken and appears accurate
  - Passing Tank Test – CSLD, SCALD, 0.2 GPH

Leak Detection – ATG – 0.2 GPH



08/14/2017 6:31 AM

LEAK TEST REPORT

REG3 9814.3 GAL

REG3

LEAK TEST	0.200 GPH
LEAK THRESHOLD	0.100 GPH
CONFIDENCE LEVEL	99.0%
TEST STARTED	12:30 AM
TEST STARTED	08/14/2017
END TIME	4:49 AM
END DATE	08/14/2017
LEVEL	21.4 IN
GROSS	1708.1 GAL
TEMP	80.8 F
TEST RESULT	PASSED

Leak Detection – ATG – CSLD/SCALD

FEB 20. 2017 12:45 PM

CSLD TEST RESULTS

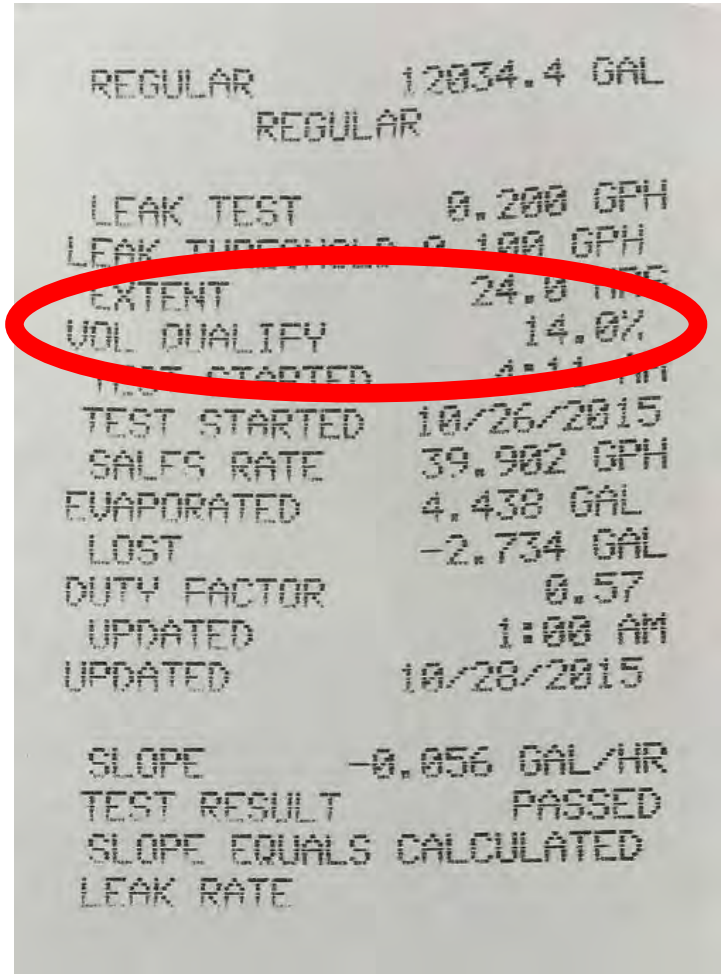
FEB 20. 2017 12:45 PM

T 1:DIESEL
PROBE SERIAL NUM 708628

0.2 GAL/HR TEST
PER:NO RESULTS AVAILABLE

T 2:REG 1
PROBE SERIAL NUM 708627

0.2 GAL/HR TEST
PER: FEB 20. 2017 PASS



Leak Detection

- Monthly Piping Leak Detection for ELLDs
  - Passing 0.2 GPH Test

Leak Detection – ELLD 0.2 GPH

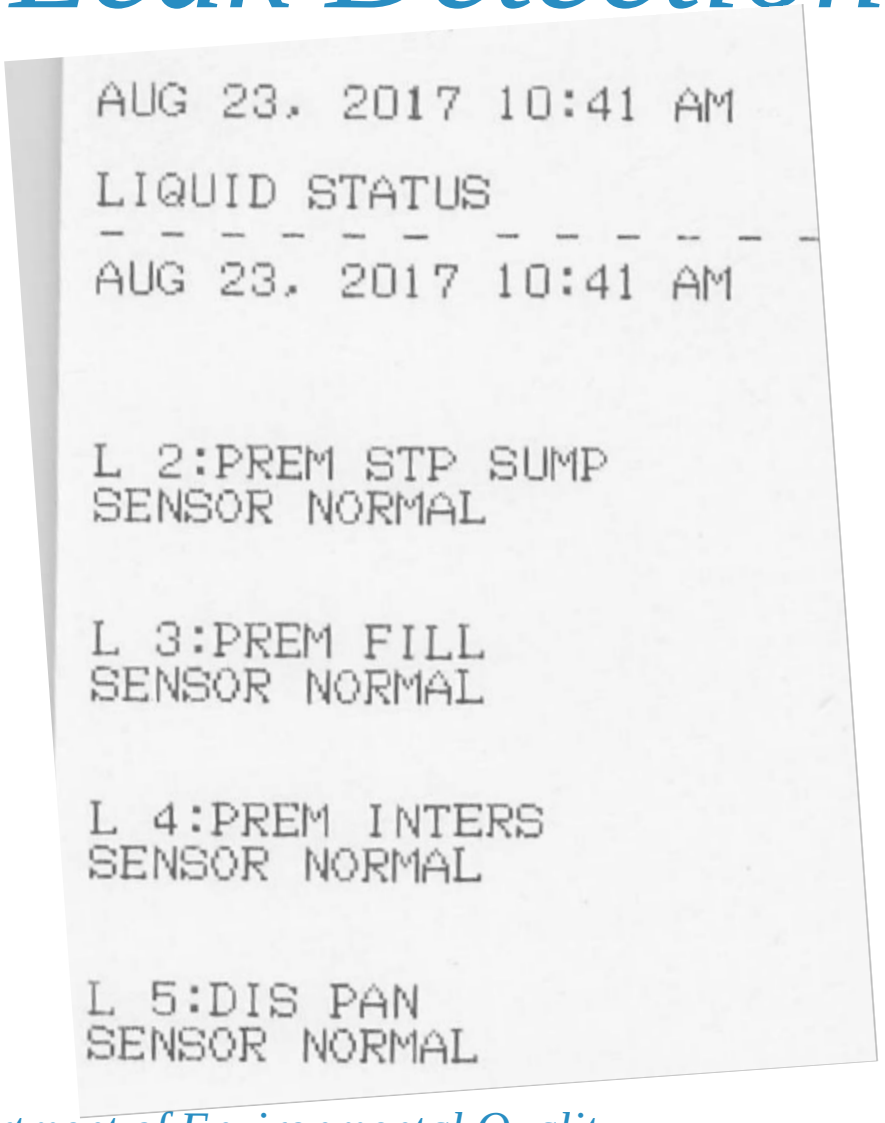
```
PRESSURE LINE LEAK
TEST RESULTS


Q 1:REG


 3.0 GAL/HR RESULTS:

LAST TEST:
NOV 28,2017   4:53PM PASS

NUMBER OF TESTS PASSED
  PREV 24 HOURS :    122
 SINCE MIDNIGHT :     81
```

```
0.20 GAL/HR RESULTS:

NOV 27,2017   6:47AM PASS
NOV 23,2017   3:44AM PASS
NOV 17,2017   2:32AM PASS
NOV 13,2017   6:55AM PASS
NOV  9,2017   5:15AM PASS
NOV  5,2017   3:20AM PASS
NOV  1,2017   2:40AM PASS
OCT 28,2017   3:00AM PASS
OCT 25,2017  12:32AM PASS
OCT 20,2017   2:22AM PASS


0.10 GAL/HR RESULTS:

NO 0.10 DATA AVAILABLE


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

Leak Detection

- Interstitial Monitoring – Electronic
  - Passing Sensor Status for each Sensor
  - Alarm History reports for each Sensor
    - Only needed for equipment installed after November 1, 2007

Leak Detection – Interstitial Electronic



AUG 23. 2017 10:41 AM

LIQUID STATUS

AUG 23. 2017 10:41 AM

L 2:PREM STP SUMP
SENSOR NORMAL

L 3:PREM FILL
SENSOR NORMAL

L 4:PREM INTERS
SENSOR NORMAL

L 5:DIS PAN
SENSOR NORMAL

ALARM HISTORY REPORT

----- SENSOR ALARM -----
L 2:PREM STP SUMP
STP SUMP
FUEL ALARM
JUL 20. 2017 10:01 AM

FUEL ALARM
JUL 3. 2017 3:43 PM

SENSOR OUT ALARM
MAY 3. 2017 2:25 PM

* * * * * END * * * * *

Department of Environmental Quality

Leak Detection

- Interstitial Monitoring for Tanks – Manual
  - Dry Interstice – Interstitial Space checked and dry
  - Brine Filled Interstice – Level of monitoring fluid within normal range
  - Vacuum Interstice – Vacuum level within tolerance

- Interstitial Monitoring for Piping – Manual
  - Containment Sumps (STP, Transition, Dispenser) checked and no liquid found

Leak Detection

- Statistical Inventory Reconciliation (SIR)
  - Check Water Level in Tank and record

MONTHLY INVENTORY RECORD

Tank Identification & Type of Fuel: #1 UNLEADED GASOLINE

Tank Size (gallons): 3008

Date of Water Check: 21 JULY 2017 Level of Water (inches): 0"

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Leak Detection

- Statistical Inventory Reconciliation (SIR)
- This month's Inventory analyzed. Last month's results passed and available.

Leak Detection

Monthly Statistical Inventory Reconciliation (SIR) Report March 2018

Company:	Get It & Go Gas, LLC	**Phone:**	123/456-7890
Address:	2020 Clear View Lane Pascagoula, NC 20202		

Station:	Get It & Go Gas 2	**Phone:**	N/A - x
Address:	247365 Day Lane Pasqcagoula, NC 20202		

SIR Provider:	TANKS BE US	**Phone:**	1-800-123-1234
SIR Version:	95.3C/Rev. 90 *	**Report Date:**	3-30-2018

Tank	Tank and Line Status	Calculated Leak Rate gph	Product	Capacity Gallons	Sales Gallons	Deliveries Gallons
GIGOD01	Pass	-0.01	HWY DIESEL	10000	2808	0
GIGOR03	Pass	-0.01	REGULAR	10000	2113	0
GIGOPrem02	Pass	-0.01	PREMIUM	10000	1619	0

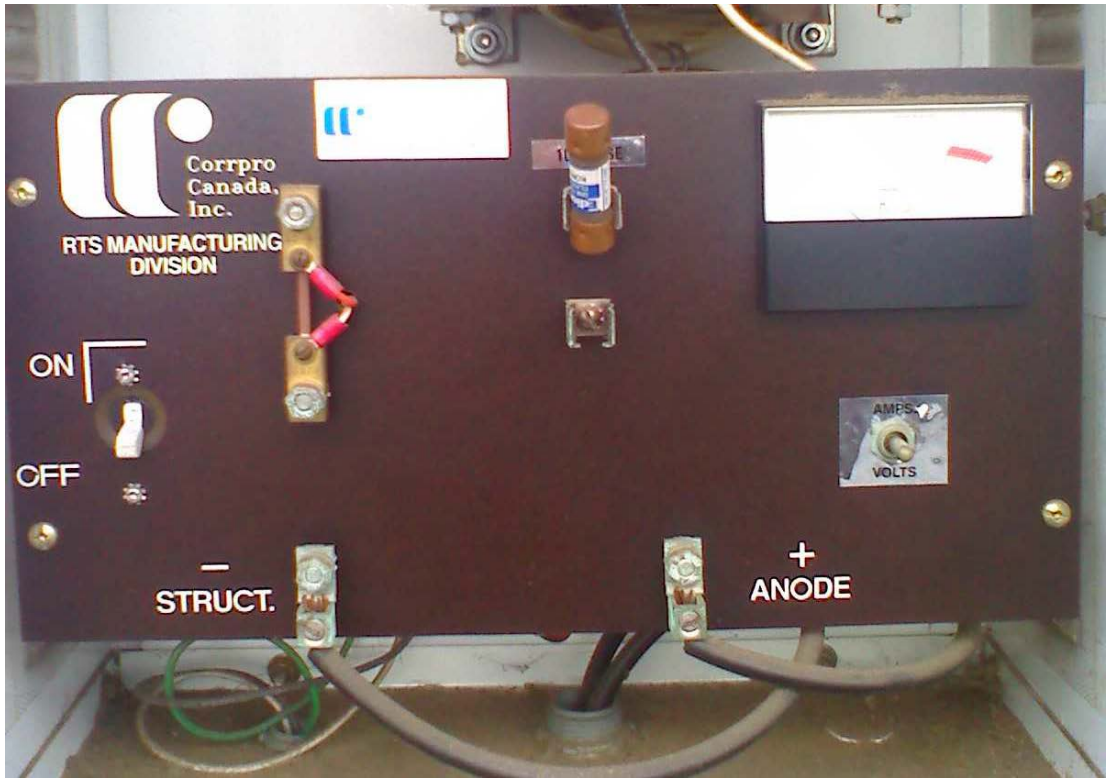
Leak Detection

- Others
  - Manual Tank Gauging
    - This month's inventory analyzed; Results compared to Weekly/Monthly standard. Last month's results passed and available for inspection
  - Groundwater Monitoring or Soil Vapor Monitoring
    - Wells sampled and results passed

Corrosion Protection

- Impressed Current Cathodic Protection Systems

Impressed Current Rectifier



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Corrosion Protection

- Impressed Current Cathodic Protection Systems
  - At least every 60 days
  - Record Volt and/or Amp Readings
  - Ensure Volt and Amp Readings are consistent with previous readings (no more than 20% change from last triennial test)
  - Record Hour meter reading (if available)
  - Use UST-27, UST-21, or other method

Form UST-27

- How do you fill out the form?
  - Must use either P (Pass), F (Fail), or N/A (Not Applicable)
  - **DO NOT** use checkmarks!!!!
  - Only need to use pages that apply to the facility.

Form UST-27

Facility ID#: 0-0-98765	Facility Name Get It & Go, LLC

By entering your name below, you certify, under penalty of law, that the inspection data provided on this form documents the UST system equipment was check (as incorporated by 15A NCAC 2N .0407).

ALL TANKS			January	February	March	April
		Month/Day	1-23	2-23	3-21	4-24
		First Initial Last Name	G. Williams	G. Williams	K. Fite	K. Fite
Spill Containment Manhole (Spill Bucket) If a UST system receives deliveries at an interval greater than every 30 days, then check prior to delivery.	No dirt, trash, water, or product in the spill-containment manhole		P	P	P	P
	No cracks, bulges, or holes in the spill-containment manhole. For metal buckets, no significant corrosion/pitting		P	P	P	P
	All clamps and rings that seal bucket around fill riser are tight		P	P	P	P
	No obstructions inside the fill pipe.		P	P	P	F
	Fill cap in good condition and seals tightly on fill pipe.		P	P	P	P
	For double-walled spill prevention equipment with interstitial monitoring, check for a leak in the interstitial area.		N/A	N/A	N/A	N/A

Form UST-27

- Find a problem during your Walkthrough Inspection?
  - Correct the problem and record what action was taken on page 4.
  - Keep and attach testing results, repair invoices, and/or other documentation for you next State inspection.

Date	Action Taken
4-24-2018	Removed tank stick from the regular 01 drop tube. Contacted transporter company to report issue. K. Fite
4-24-2018	Failure 0.2 gph test for Diesel tank. Contacted petroleum equipment contractor on 4-24-2018, he serviced probe and cleared alarm on 4-27-2018. K. Fite

Form UST-22A

- Overfill Prevention Equipment Operability Check
  - Flapper Valve (Automatic Shut Off)
  - Ball Floats
  - High Level Alarm

- First Overfill Operability Check must be completed prior to **October 13, 2018** (for equipment installed prior to November 1, 2007)

UST-22A
Page 1

Delete Page

Overfill Prevention Equipment Operability Check
INSTRUCTIONS

Lock Form Data Entry

Operability check of overfill equipment required **annually for UST systems installed on or after November 1, 2007** (this includes existing UST systems that have installed or replaced these components on or after November 1, 2007) or **triennially for UST systems installed before November 1, 2007** or for any existing UST system regardless of installation date prior to returning to service from temporary closure.

- Inspect overfill prevention equipment for operability, proper operating condition, and calibration in accordance with PEI RP 1200, "Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection, and Secondary Containment Equipment at UST Facilities" and/or the "Overfill Prevention Equipment Inspection Procedure" below and any additional inspection procedures listed in the manufacturer's guidelines. Page 4 only required if tank tilt must be determined per guidelines listed on this page.
- Step-by step instructions, with example calculations, for conducting the operability check can be found at the following address: http://deq.nc.gov/about/divisions/waste-management/ust/guidance-documents
- In accordance with 15A NCAC 2N .0301, new ball float vent valves cannot be installed after June 1, 2017.

Overfill Prevention Equipment Inspection Procedure

Flapper Valve/Auto Shut Off	1. Remove tank fill cap and visually confirm that drop tube device is present and not obstructed. 2. Ensure that tight-fill adapter on fill riser is tight and in good condition. 3. Remove drop tube device and ensure that the drop tube assembly is in good condition and all necessary gaskets/seals are in place. 4. Ensure that the drop tube device is installed correctly in accordance with manufacturer's requirements. Enter measurement from tank top to point that overfill equipment completely shuts off product flow. 5. Determine if tank has a ball float installed. If a ball float is installed, then either remove the entire ball float valve assembly or determine the ball float valve body length from tank top and the percentage that flow restriction occurs (Enter the ball float valve length and percentage in the ball float section on page 2) and ensure that the flapper/auto-shutoff device will completely shut-off flow at a lower level in tank. If the length of the ball float cannot be determined, then the flapper/auto shutoff device must be installed at less than 90% of tank capacity. 6. Complete the "Tank Tilt Determination" section of this form if the drop tube device is set to completely shutoff flow at greater than 95% of tank capacity and if the tank is tilted by one inch or more, the drop tube device must be installed in the low end of the tank.

Form UST-22A

Inspect overfill prevention equipment for:

- Operability
- Proper operating condition
- Proper calibration

Form UST-22A

Must be done in accordance with:

- **PEI RP 1200**, “Recommended Testing and Verification of Spill, Overfill, Leak Detection, and Secondary Containment Equipment at UST Facilities” and/or
- “Overfill Prevention Equipment Inspection Procedure” on form and
- Any additional inspection procedures listed in the manufacturer's guidelines

Form UST-22A

- Overfill operability must be tested every 3 years. (only applies if installed prior to 11/1/07).
- Overfill equipment installed after 11/1/07 must be tested annually.
- Any newly installed overfill equipment must be tested at install and then annually.

Flapper/Auto Shut Off

- Must be clear of obstructions to function
- Must be set to activate at no more than 95% of tank volume (unless tank tilt criteria are met)

Flapper/Auto Shut Off

- Must be removed to test operability
  - This is the only way to determine if the float is in tact
  - Check for damage

High Level Alarm

- Must be audible and identifiable by delivery person
- Must be set to activate at no more than 90% of tank volume (unless tank tilt criteria are met)

High Level Alarm

- The probe must be removed to test operability
  - This is the only way to tell if the float moves properly
  - Check for damage

Ball Float

- Must be set to activate at no more than 90% of tank volume (unless tank tilt criteria are met)

Ball Float

- Must be removed to test operability
  - Check for damage

Department of Environmental Quality

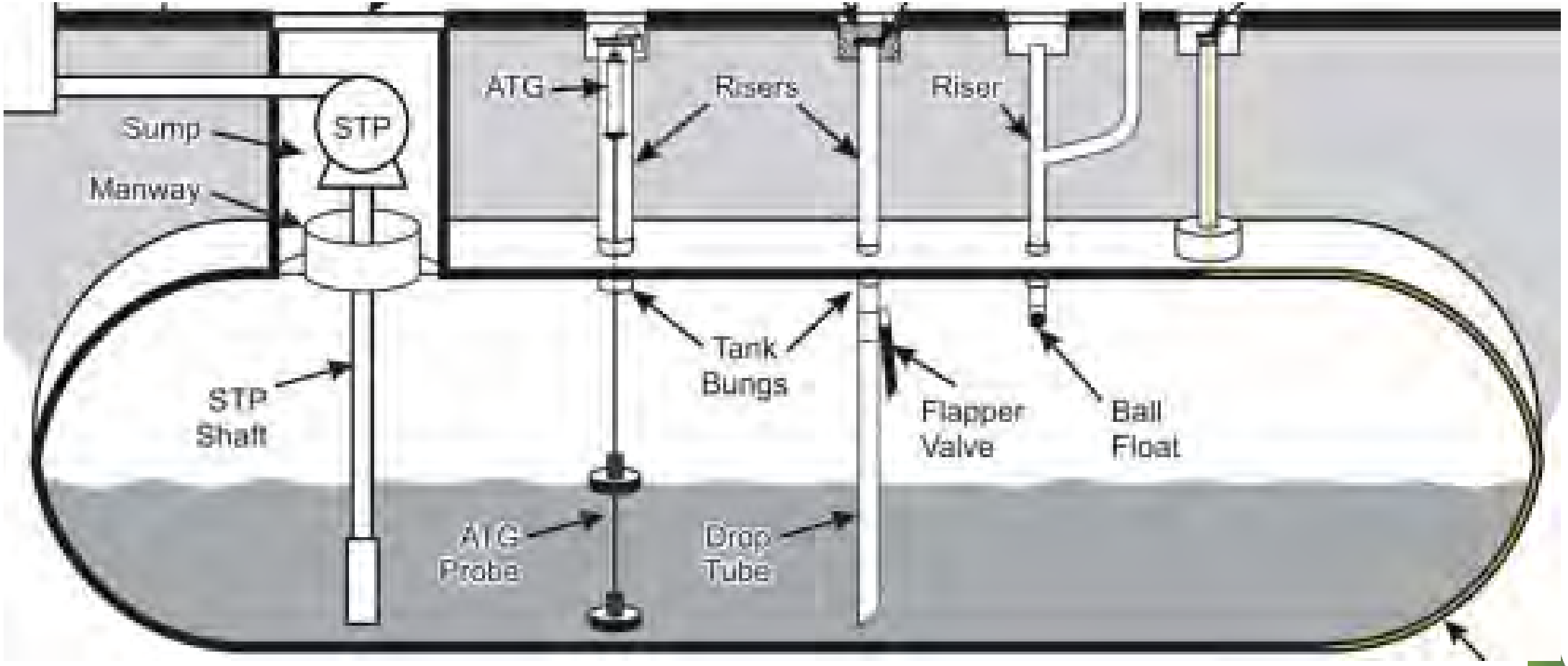
Ball Float

- Effective June 1, 2017
- Can no longer install new ball floats
- If existing ball float is too short, then it must be replaced with another method of overfill
  - The UST Section is not aware of any manufacturer with procedures to increase the length of an existing ball float

Ball Float

- Must be removed completely **OR** prove that it is set higher than other overfill methods used.
  - If level can't be proven, then new overfill method must be set lower than 90%

Form UST-22A



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Form UST-22A

- Each section must be filled out completely for each tank for the method of overfill on that tank
  - All questions must be answered
- Tank Tilt Determination must be completed for overfill above the allowed limits to pass
  - 95% for Flapper/Auto Shutoff
  - 90% for Ball Floats or High Level Alarms

Form UST-22A

- How do you fill out the form?

Instructions to fill out the UST-22A form is provided on the UST Sections forms page with the UST-22A.

UST-22A	Overfill Prevention Equipment Operability Check (Instructions)	9/2017		

Form UST-22A

Before you can complete the operability check you need to have the following:

- Tank Type (Steel or FRP) and Compartment or Non-compartment
- Correct Tank Chart (if it is an FRP compartment tank, you must determine if it is the base or end tank)

Form UST-22A

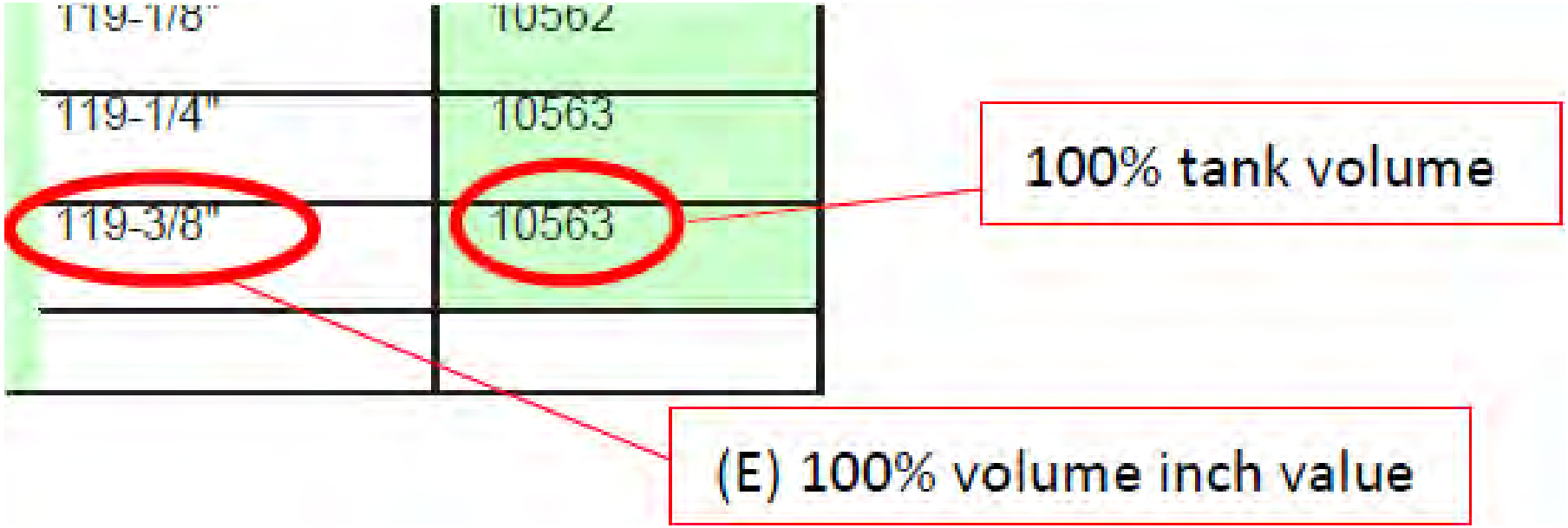
For our calculations we are using a 10,000 gallon, SW, 10’ diameter, Xerxes FRP tank.

Dipstick Calibration Chart for 10,000 Gallon - 10' Diameter **SW & DWT-I** Tank

DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS
0-1/8"	2	8-1/2"	279	16-7/8"	805	25-1/4"	1498	33-5/8"	2315	42"	3222	50-3/8"	4188
0-1/4"	3	8-5/8"	286	17"	814	25-3/8"	1509	33-3/4"	2328	42-1/8"	3236	50-1/2"	4203
0-3/8"	4	8-3/4"	292	17-1/8"	823	25-1/2"	1521	33-7/8"	2341	42-1/4"	3250	50-5/8"	4217
0-1/2"	6	8-7/8"	298	17-1/4"	833	25-5/8"	1532	34"	2354	42-3/8"	3264	50-3/4"	4232
0-5/8"	7	9"	305	17-3/8"	842	25-3/4"	1544	34-1/8"	2367	42-1/2"	3278	50-7/8"	4247
0-3/4"	9	9-1/8"	311	17-1/2"	851	25-7/8"	1555	34-1/4"	2380	42-5/8"	3292	51"	4262
0-7/8"	11	9-1/4"	318	17-5/8"	861	26"	1567	34-3/8"	2393	42-3/4"	3307	51-1/8"	4276
1"	13	9-3/8"	325	17-3/4"	870	26-1/8"	1578	34-1/2"	2406	42-7/8"	3321	51-1/4"	4291

Form UST-22A

- Find the maximum tank diameter and volume on the chart



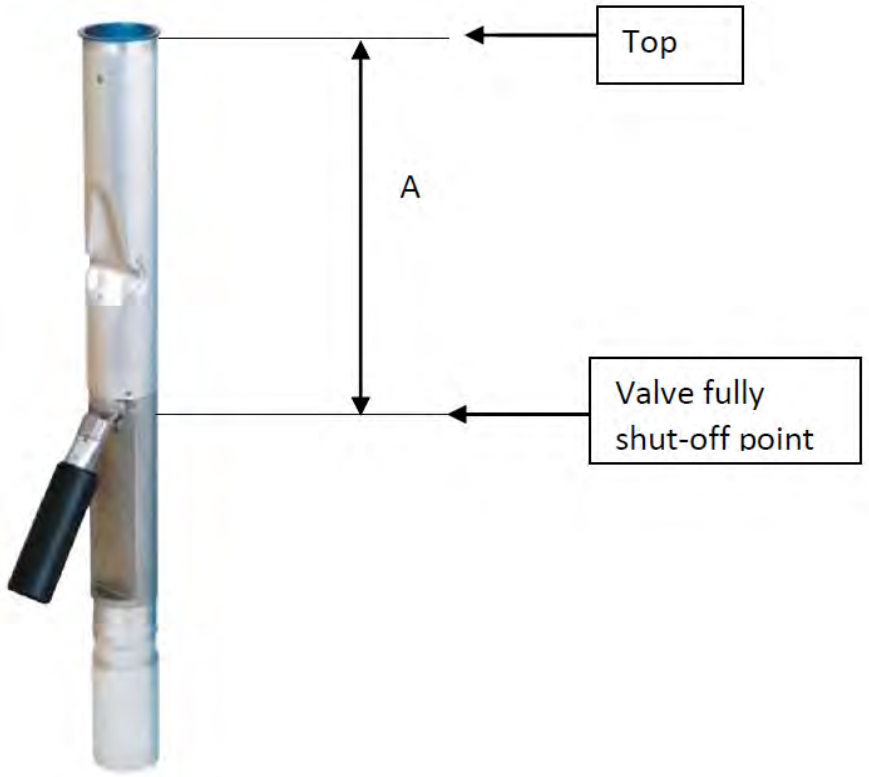
Form UST-22A

- Record the Tank #, Product, Max tank chart volume, Tank diameter, Tank Type, and base or end tank on the form.

Overfill Equipment Check	Tank # 1
Product:	Regular
Tank chart volume (gallons):	10563
Tank diameter (inches):	119 3/8
Tank Type:	☒ FRP ☐ Steel
If FRP Compartment tank, select:	☒ Base ☐ End

Flapper/Auto Shut Off Calculations

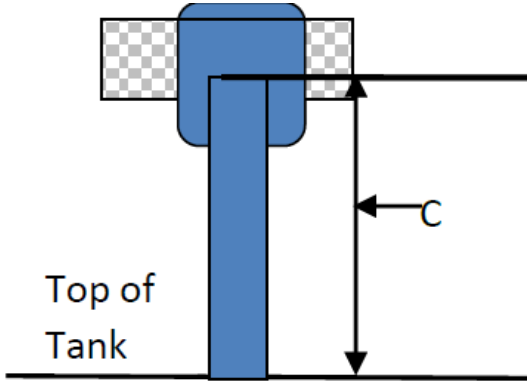
- Step 1:
  - Remove the overfill device and measure the flapper valve full shut-off point to the top of where the overfill device is attached (A).



- Ex) A = 58"

Flapper/Auto Shut Off Calculations

- Step 2:
  - Measure from the top of the stand pipe to the inside of the top of the tank (C).



- Ex) C = 43"

Bottom
of Tank

Flapper/Auto Shut Off Calculations

- Step 3:
  - Subtract the length of the stand pipe (C) from the flapper valve's full shut-off point (A).
  - A – C = Length from top of tank to flapper shutoff point

- Ex) 58“ - 43“ = 15"

Flapper/Auto Shut Off Calculations

- Step 4:
  - Enter this number on the UST-22A

Current length from tank top to flapper shutoff point (inches) **FSP**	15

Flapper/Auto Shut Off Calculations

- Step 5:
  - Subtract the current length from top of tank to flapper shutoff point from the maximum tank chart diameter.

- Ex) 119 ⅜” - 15” = 104 ⅜”

Flapper/Auto Shut Off Calculations

- Step 6:
  - Find the corresponding gallons on the tank chart.

95-3/8"	9199	104-1/8"	9892
95-1/2"	9210	104-1/4"	9901
95-5/8"	9221	104-3/8"	9910
95-3/4"	9232	104-1/2"	9918
95-7/8"	9243	104-5/8"	9927

- Ex) 104 ⅜” = 9910 gallons

Flapper/Auto Shut Off Calculations

- Step 7:
  - Next you will convert this into the percent of the tank volume when the automatic shut off device activates.
  - Divide the gallons of product at flapper activation by the maximum tank chart volume.

- Ex) 9,910 gallons/10,563 gallons = .938 = 93.8%

Flapper/Auto Shut Off Calculations

- Step 8:
  - Enter this value into the Percent tank volume when complete shutoff occurs (%) on the UST-22A.

Percent tank volume when complete shutoff occurs (%)	93.8

  - If the percentage is greater than 95%, then you will need to either calculate tank tilt or fail the test.

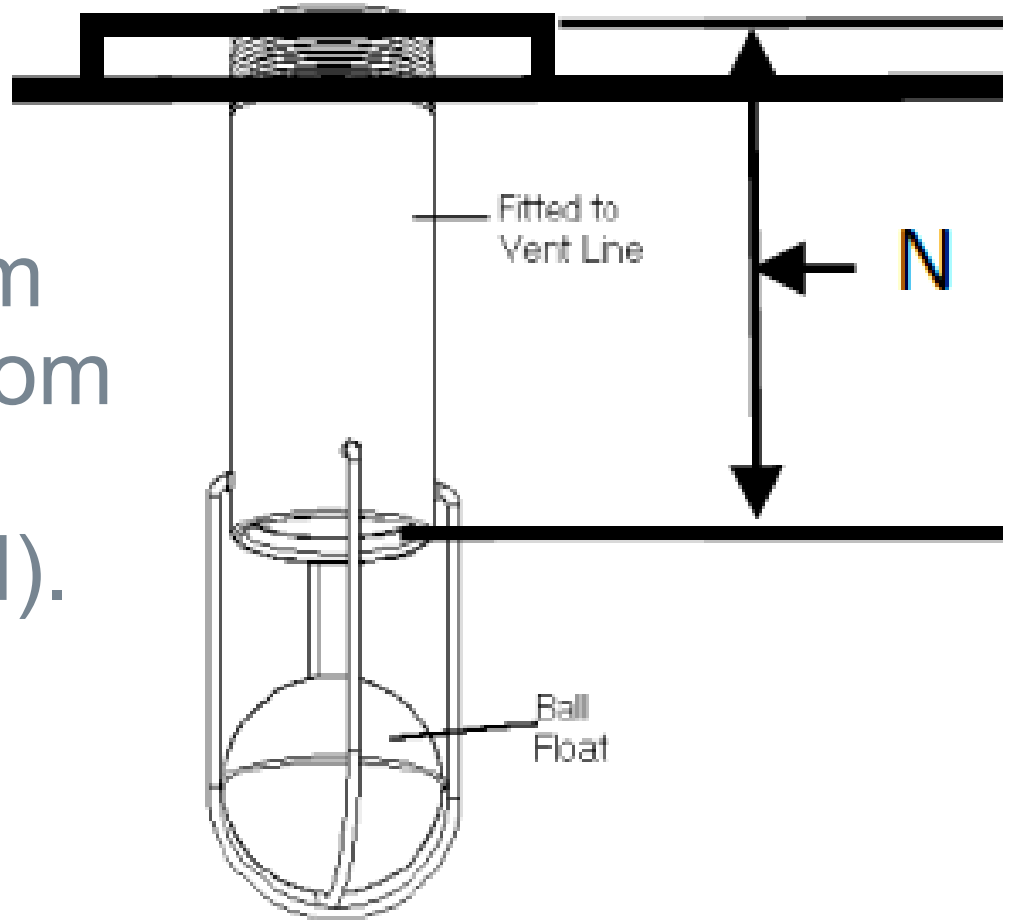
Flapper/Auto Shut Off Calculations

If all questions are marked yes and the Flapper/Auto Shut off is set at 95% or less of the maximum tank chart volume it passes. If ball float is present, length must be determined and flapper must be set lower than ball float. Flapper must be set below 90% if ball float length is not determined.

	Pass	Fail
Inspection Result	☒	☐

Ball Float Calculations

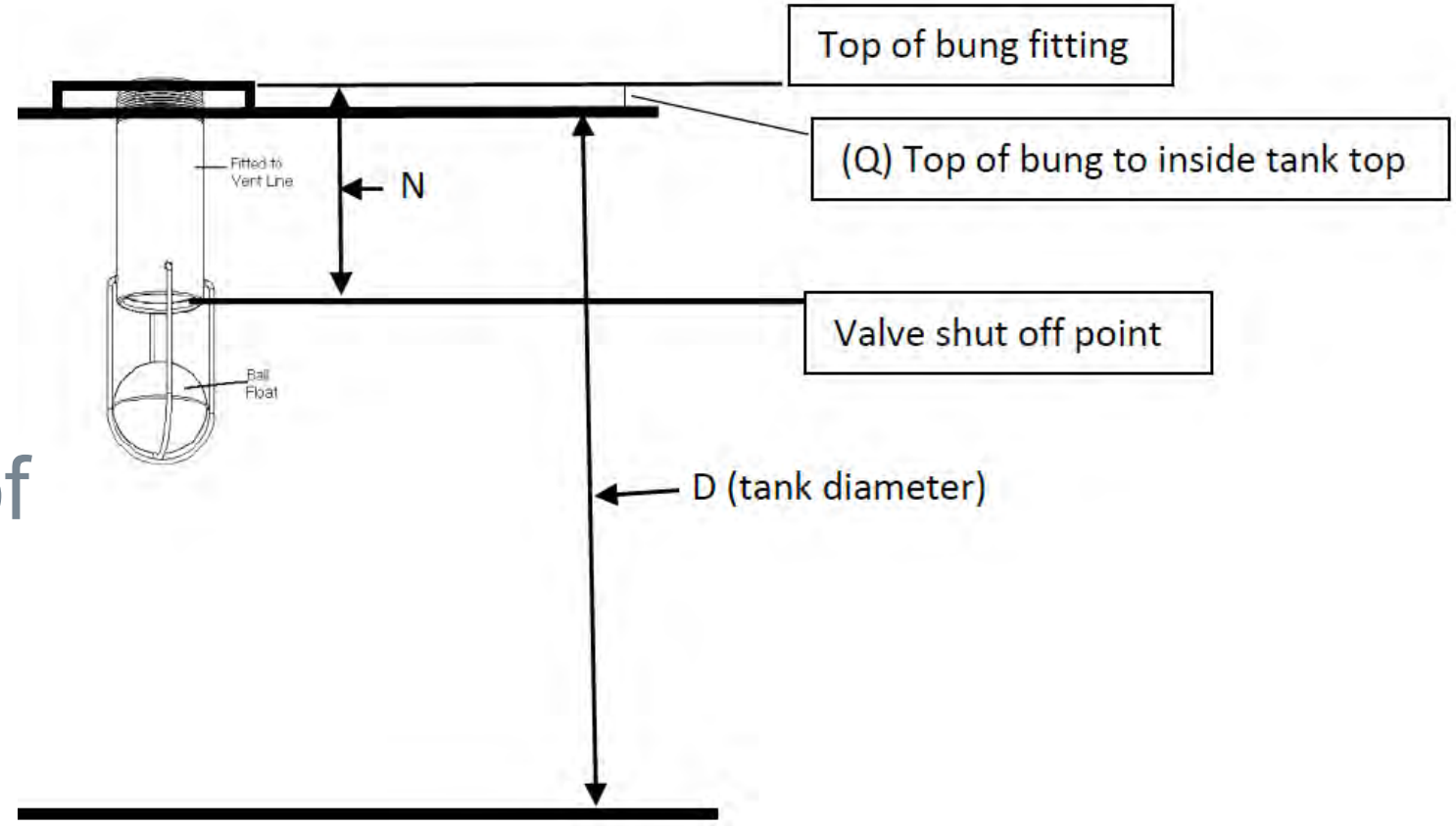
- Step 1:
  - Remove the ball float from the tank. Measure the distance from the ball float shut off point (bottom of the tube) to the top of the threads on the ball float tube (N).



- Ex) N = 28"

Ball Float Calculations

- Step 2:
  - While the ball float is out, measure the threaded tank bung fitting from the inside of the tank to the top (Q).



- Ex) Q = 4"

Ball Float Calculations

- Step 3:
  - Next subtract the total length from the inside top of the tank to the top of the threaded tank bung fitting (Q) from the total length of the ball float tube (N). Then add back ¼".
  - N – Q + ¼“ = current length from the tank top to ball float set point

- Ex) (28“ - 4") + ¼" = 24¼"

Ball Float Calculations

- Step 4:
  - Enter the current length from the tank top to ball float set point (inches)

Current length from tank top to ball float set point (inches) **BFSP**	24 1/4

Flapper/Auto Shut Off Calculations

- Step 5:
  - Subtract the current length from top of tank to ball float set point from the maximum tank chart diameter.

- Ex) 119 ⅜” - 24 ¼” = 95 ⅛”

Flapper/Auto Shut Off Calculations

- Step 6:
  - Find the corresponding gallons on the tank chart.

86-1/8"	8312	94-7/8"	9155
86-1/4"	8325	95"	9166
86-3/8"	8338	95-1/8"	9177
86-1/2"	8351	95-1/4"	9188
86-5/8"	8364	95-3/8"	9199

- Ex) 95 ⅛” = 9177 gallons

Ball Float Calculations

- Step 7:
  - Next you will convert this into the percent of the tank volume when the ball float activates. Divide the gallons of product at the level of ball float activation by the maximum tank chart volume.

- Ex) 9,177 gallons/10,563 gallons = .8687 = 86.9%

Ball Float Calculations

- Step 8:
  - Enter the value in Percent tank volume when flow restriction occurs (%)

Percent tank volume when flow restriction occurs (%)	86.9

  - If the percentage is greater than 90%, then you will need to either calculate tank tilt or fail the test (if no 30 minute kit installed)

Ball Float Calculations

If all questions are marked yes and the ball float is set at 90% or less of the maximum tank chart volume (without a 30 minute restrictor kit), it passes.

	Pass	Fail
Inspection Result	☒	☐

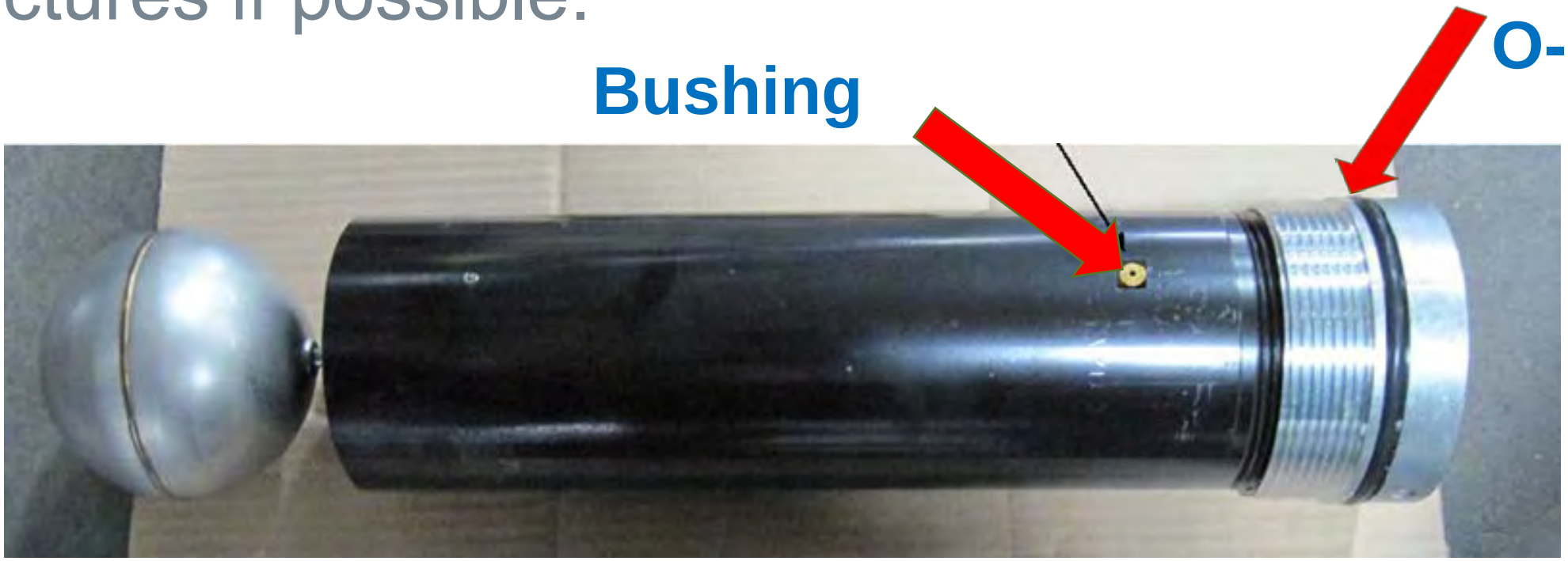
Ball Float Calculations

Note: If the value is greater than 90%, then the ball float fails unless a 30 minute flow restrictor kit is installed and verified or tank tilt is calculated. The 30 minute restrictor kit should be recorded on the UST-22A if present.

30-minute flow restrictor installed (if ball float set at more than 90%)	☒ Yes ☐ N/A

Ball Float Calculations

The 30 minute restrictor kit should be documented with pictures if possible.



Overfill Alarm Calculations

- Step 1:
  - Measure the product level in the tank manually and compare to the console readings to confirm the probe is calibrated and the ATG is accurate. If incorrect, the equipment needs to be repaired or replaced before proceeding.

Overfill Alarm Calculations

- Step 2:
  - Remove the probe and inspect. The floats must move freely on the stem without binding. If any parts are damaged or missing, repair or replace the probe.
- Step 3:
  - Reconnect the probe.

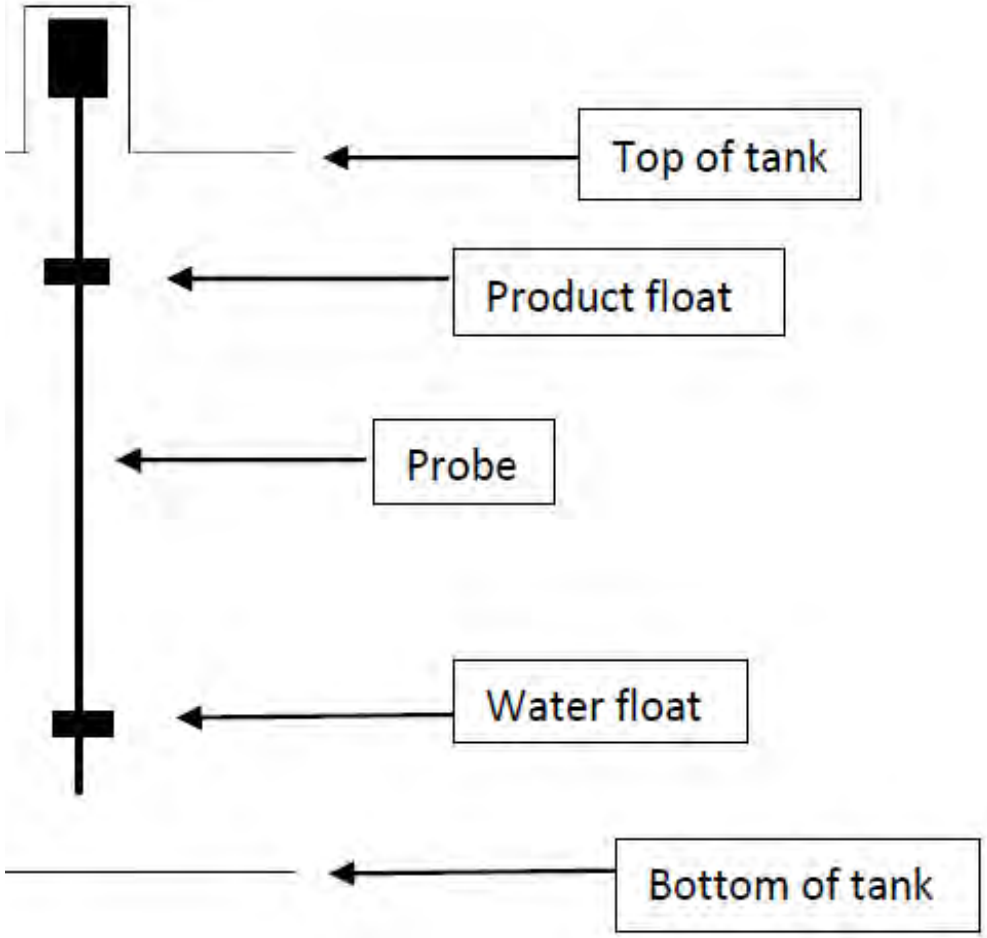
Overfill Alarm Calculations

- Step 4:
  - Set the product float in the middle of the probe. Slowly move the product float up the probe until the overfill alarm is triggered. You should hear this outside when the alarm sounds the overfill warning.

Overfill Alarm Calculations

- Step 5:
  - Measure the length of the probe from the bottom of the stem to the point the 90% alarm activates.

- Ex) Alarm is triggered at 99”



Overfill Alarm Calculations

- Step 6:
  - Record the level in inches from the bottom of stem when alarm is triggered. (Line 7)

7. Inch level from bottom of stem when 90% alarm is triggered.	99

Overfill Alarm Calculations

- Step 7:
  - Using the tank chart, convert level in inches from the bottom of stem when alarm is triggered to tank volume at which the alarm is activated.

90-1/8"	8712	98-7/8"	9496
90-1/4"	8724	99"	9506
90-3/8"	8737	99-1/8"	9517

- Ex) 99” = 9,506 gallons.

Overfill Alarm Calculations

- Step 8:
  - Record tank volume at inch level in Line 7. (Line 8).

8. Tank volume at inch level in Line 7.	9506

Overfill Alarm Calculations

- Step 9:
  - To get the percent tank volume when alarm occurs, divide the volume at which the alarm activates (Line 8) by the maximum tank chart volume (Line 1).

- Ex) 9,506/10,563 = .899 = 89.9%

Overfill Alarm Calculations

- Step 10:
  - Record percent tank volume when alarms occurs (%) (Line 9) and attach alarm setup.

9. Percent tank volume when alarm occurs (%) (attach alarm setup) (Line 8 / Line 1) X 100	89.9

Overfill Alarm Calculations

Conditions of a passing result:

- The overfill alarm must activate at 90% full or less.
- The fuel level on the console must agree with the gauge stick reading.
- The audible overfill alarm must activate during the test.

	Pass	Fail
Inspection Result	☒	☐

Form UST-22B

- Annual Leak Detection Equipment Operability Check
  - Interstitial Sensors
  - Automatic Tank Gauge/Handheld LD Equipment
  - Mechanical & Electronic Line Leak Detectors
  - Groundwater/Vapor Monitoring Equipment

- First LD Operability Check must be completed prior to **October 13, 2018**

UST-22B
Page 1

Insert Page | Delete Page

Annual Leak Detection Equipment Operability Check
(Interstitial Sensors)

Lock Form Data Entry

Inspect the leak detection equipment in accordance with manufacturer guidelines and PEI RP 1200, "Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection, and Secondary Containment Equipment at UST Facilities". If the manufacturer's instructions do not require a condition to be implemented that triggers an alarm, then you must also trigger an alarm condition. Print the alarm reports triggered during the operability check and attach to this form.

Results must be maintained for at least one year at the UST site or the tank owner or operator's place of business, and be readily available for inspection.

UST FACILITY

Owner / Operator Name	Facility Name	Facility ID
Facility Street Address	Facility City	County

CONTRACTOR/PERSON CONDUCTING INSPECTIONS

Company Name	Phone	Email address

I certify, under penalty of law, that the testing data provided on this form documents the UST system equipment was checked in accordance with the manufacturer's guidelines and the applicable national industry standards listed in 15A NCAC 2N .407/.0501 and/or 15A NCAC 2N .0900.

Print Name of person conducting inspection	Signature of person conducting inspection	Inspection Date

Sensor Location:	☐ Dispenser ☐ Spill Bucket ☐ Tank Interstice ☐ Tank Top and Other Sumps	☐ Dispenser ☐ Spill Bucket ☐ Tank Interstice ☐ Tank Top and Other Sumps	☐ Dispenser ☐ Spill Bucket ☐ Tank Interstice ☐ Tank Top and Other Sumps	☐ Dispenser ☐ Spill Bucket ☐ Tank Interstice ☐ Tank Top and Other Sumps	☐ Dispenser ☐ Spill Bucket ☐ Tank Interstice ☐ Tank Top and Other Sumps
Enter Location #/Description:	#:	#:	#:	#:	#:

Form UST-22B

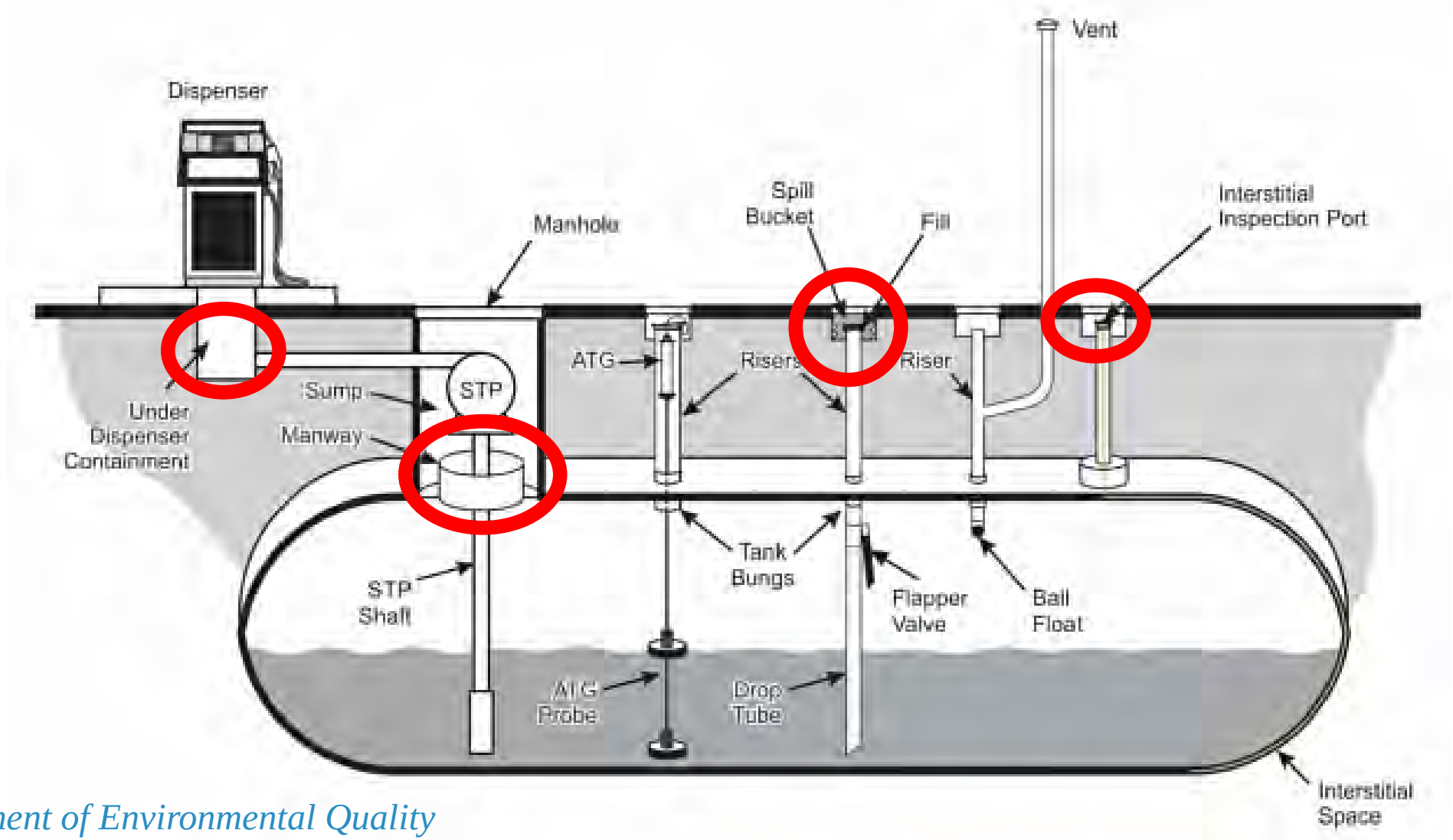
Inspect the leak detection equipment in accordance with:

- **Manufacturer guidelines and**
- **PEI RP 1200**, “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection, and Secondary Containment Equipment at UST Facilities”.

Interstitial Sensors

- If the manufacturer's instructions do not require a condition to be implemented that triggers an alarm, then you must also trigger an alarm condition.
- **Print the alarm reports triggered during the operability check and attach to this form.**

Interstitial Sensors



Department of Environmental Quality

Interstitial Sensors

- All Sensors should be listed with location and labeled correctly – must match labeling/location on Sensor Status reports

Interstitial Sensors

- Type of Sensors
  - Discriminating or Non-Discriminating
  - Position Sensitive – does sensor alarm when raised

Interstitial Sensors

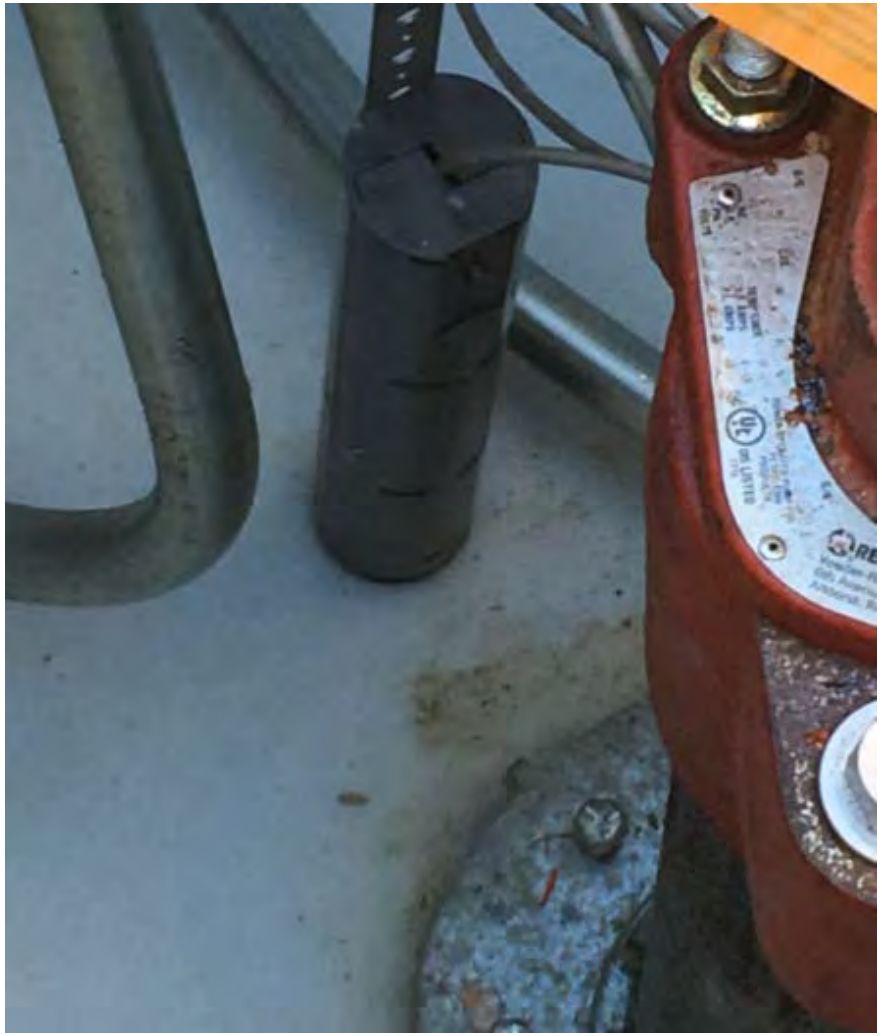
- Test Liquid
  - Water or Product
  - Does sensor trigger alarm

Interstitial Sensors

- Is the ATG Console clear of any active warnings or alarms regarding the sensors.
  - If alarm is active indicate why in comment box
- Is the alarm circuit operational?
- Sensor inspected and in good operating condition
- Sensor properly identified on the ATG console?

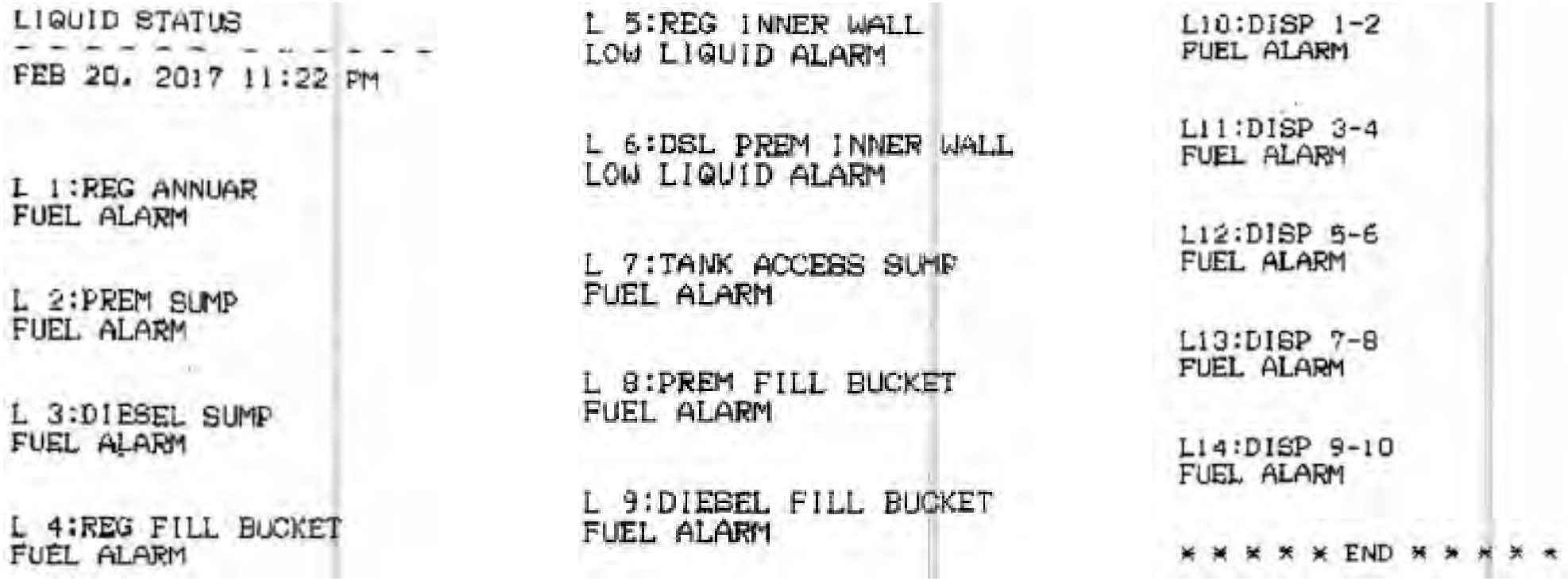
Interstitial Sensors

- Sensor mounted at the lowest point of the interstice?



Interstitial Sensors

- Alarm Report from ATG must be attached.



LIQUID STATUS

FEB 20. 2017 11:22 PM

L 1:REG ANNUAR
FUEL ALARM

L 2:PREM SUMP
FUEL ALARM

L 3:DIESEL SUMP
FUEL ALARM

L 4:REG FILL BUCKET
FUEL ALARM

L 5:REG INNER WALL
LOW LIQUID ALARM

L 6:DSL PREM INNER WALL
LOW LIQUID ALARM

L 7:TANK ACCESS SUMP
FUEL ALARM

L 8:PREM FILL BUCKET
FUEL ALARM

L 9:DIESEL FILL BUCKET
FUEL ALARM

L10:DISP 1-2
FUEL ALARM

L11:DISP 3-4
FUEL ALARM

L12:DISP 5-6
FUEL ALARM

L13:DISP 7-8
FUEL ALARM

L14:DISP 9-10
FUEL ALARM

* * * * * END * * * * *

Automatic Tank Gauge

- ATG probes accurately measures fuel and water levels?
- Probe is not damaged and float moves freely?
- 90% alarm is set at proper level and activates?
- Water alarm is set at proper level and activates?

Tank Gauge Stick

- Can be clearly read, not warped or broken.
- Plastic button must be on bottom of stick.

Vacuum/Pressure Monitoring Equipment

- Vacuum/Pressure gauge is functional and calibration has been checked?

ALLDs

- For each tank, complete each section:
  - Tank #
  - Tank Volume
  - Product

ALLDs

- For each tank, complete each section:
  - Leak Detector Manufacturer
  - Leak Detector Model
  - Type of Leak Detector
    - MLLD
    - ELLD

ALLDs

- If a tank has more than one ALLD, list each separately.
- **All** ALLDs must be tested annually using an approved testing method.
  - This is new for ELLDs – Self Test will no longer be accepted
- If ALLD is replaced, then new one must be tested at install.

ALLDs

- Appropriate section of the UST-22B must be completely filled out AND supporting documentation must be attached.
- May continue to use your form as long as it contains ALL of the information requested on the UST-22B

Groundwater/Vapor Monitoring

- Handheld or Electronic equipment operable, serviceable and/or calibrated?
- Equipment alarm and battery backup functional?
- Equipment configuration checked and within specifications?

Groundwater/Vapor Monitoring

- Probes and sensors have no residual buildup?
- Floats move freely, shaft not damaged, wires free of kinks/breaks?
- Alarm tested and operable?

Form UST-22B

- Any “No” marked on the form indicates that section fails the inspection and must be explained and corrected.
- New equipment (sensors, probes, ALLDs) must be tested at installation.

Form UST-22C

- Annual Sump Visual Inspections
  - Dispenser Sump
  - STP, Transition, Other Sump

- First Visual Inspection must be completed prior to **October 13, 2018**

UST-22C

Insert Page

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Annual Sump Visual Inspections (Dispenser Sumps)

Lock Form Data Entry

Underground Storage Tank (UST) system owners and operators are required to conduct a STP, dispenser, or other sump visual check at least annually for any UST system regardless of installation date. Results must be maintained for at least one year at the UST site or the tank owner or operator's place of business, and be readily available for inspection.

- Visually inspect STP, dispenser and other sump areas (whether containment present or not) for liquids (water or regulated substances), sump damage, penetration boot damage, faulty equipment, and equipment leaks. If none of the above items are observed during the inspection, check **Pass** in the appropriate column, otherwise check **Fail**. If **Fail**, indicate what action was taken to repair the containment sump or faulty equipment in the comment portion of this form or attach documentation of any repairs.
- If the sump contains a regulated substance or there are other indications of a release of a regulated substance, it must be reported as a suspected release using the UST-17A form, *UST Suspected Release 24 Hour Notice*.

UST FACILITY

Owner / Operator Name	Facility Name	Facility ID
Facility Street Address	**Facility City**	**County**

CONTRACTOR/PERSON CONDUCTING INSPECTIONS

Company Name	Phone	Email address

I certify, under penalty of law, that the testing data provided on this form documents the UST system equipment was checked in accordance with the manufacturer's guidelines and the applicable national industry standards listed in 15A NCAC 2N .0407/.0900.

Print Name of person conducting inspection	Signature of person conducting inspection	Inspection Date

Dispenser Sump		Disp #	Disp #	Disp #	Disp #	Disp #
ALL	No leaks, weeps, or drips observed					

Form UST-22C

Underground Storage Tank (UST) system owners and operators are required to conduct a STP, dispenser, or other sump visual check at least annually for any UST system regardless of installation date.

Form UST-22C

- What is considered a sump?
  - Any opening in the ground where you can access piping components.
    - Beneath Dispensers
    - Tank Tops
    - Transition areas
  - Does not need to be a manufactured containment sump

Form UST-22C

- Beneath Dispensers

Form UST-22C

- Tank Tops

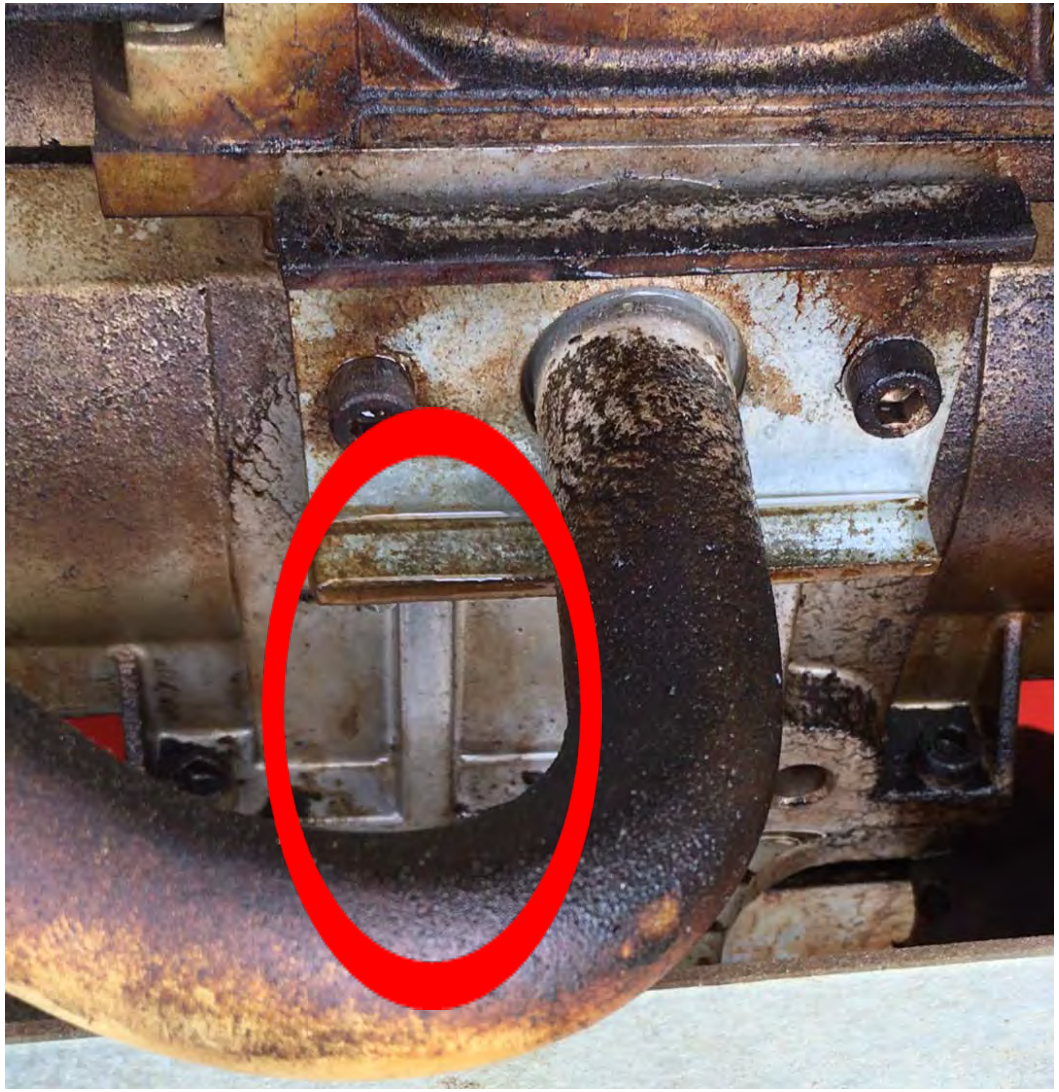
Form UST-22C

- Transition Areas

Dispenser Sump - All

- No leaks, weeps, or drips
- Piping is free of defects
- Sump does not contain trash, debris, and used filters
- Flex connectors not frayed, twisted, kinked, or bent beyond manufacturer specifications
- Shear valves operate freely, close completely and are anchored correctly

STP/Transition/Other Sump - All



Dispenser Sump – All

Dispenser Sump		Disp # 1/2
ALL	No leaks, weeps, or drips observed	Pass
	Piping is free of defects	Pass
	Sump does not contain trash, debris and used filters	Fail
	Flexible connectors not frayed, twisted, kinked or bent beyond manufacturer specifications	N/A
	Shear valves operate freely, close completely and are anchored correctly	Pass

Without Containment

- Flex connector(s) and other metallic product piping and piping components are not in contact with soil or water or are cathodically protected

WITHOUT CONTAINMENT	Flex connector(s) and other metallic product piping and piping components are not in contact with soil or water or are cathodically protected	Pass

Without Containment

Without Containment

- What is the method of corrosion protection for the flex connectors and other metallic product piping and piping components at this dispenser?
- We can't verify something we can't see.

With Containment

- Sump is dry and doesn't contain product and/or water
- Sump walls/bottom are not damaged (i.e., cracks, bulges, holes, etc.) (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)

With Containment

Department of Environmental Quality

With Containment

- Penetration fittings intact and in good condition (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)
- Sump Sensor is < 2” from lowest point (N/A if not conducting interstitial monitoring)

With Containment

With Containment

- Piping interstitial space is open to the sump (Open systems only, N/A if closed system or not conducting interstitial monitoring)

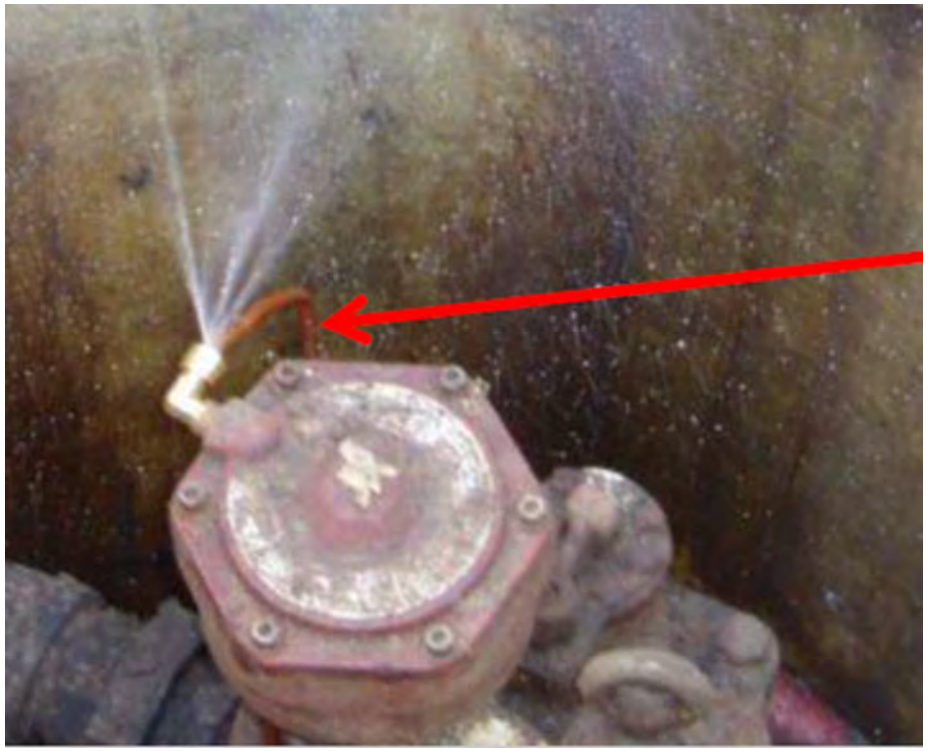
With Containment

WITH CONTAINMENT	Sump is dry and does not contain product and/or water	Pass
	Sump walls/bottom are not damaged (i.e., cracks, bulges, holes, etc.) (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)	Pass
	Penetration fittings intact and in good condition (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)	Fail
	Sump Sensor is < 2" from lowest point (N/A if not conducting interstitial monitoring)	Fail
	Piping interstitial space is open to the sump (Open systems only, N/A if closed system or not conducting interstitial monitoring)	N/A

STP/Transition/Other Sump - All

- No leaks, weeps, or drips
- Piping is free of defects
- Sump does not contain trash and debris
- Flex connectors not frayed, twisted, kinked, or bent beyond manufacturer specifications
- Mechanical line leak detector properly vented, vent tube not kinked or twisted, vent tube fittings intact and tightened

STP/Transition/Other Sump - All



STP/Transition/Other Sump - All

STP/Transition/ Other Sump	Tank Size/Location:	10,000
	Product:	Regular
ALL	No leaks at submersible pump, ALLD, or other pipe components	Pass
	Piping is free of defects	Pass
	Sump does not contain trash and debris	Fail
	Flexible connectors not frayed, twisted, kinked or bent beyond manufacturer specifications	N/A
	Mechanical line leak detector properly vented, vent tube not kinked or twisted, vent tube fittings intact and tightened	Pass

Without Containment

- Submersible pump head, flex connector(s) and other metallic product piping and piping components are not in contact with soil or water or are cathodically protected

WITHOUT CONTAINMENT	Submersible pump head, flex connector(s) and other metallic product piping and piping components are not in contact with soil or water or are cathodically protected	Pass

Without Containment

- What is the method of corrosion protection for the flex connectors and other metallic product piping and piping components in this sump?
- We can't verify something we can't see.

With Containment

- Sump is dry and doesn't contain product and/or water
- Sump walls/bottom are not damaged (i.e., cracks, bulges, holes, etc.) (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)

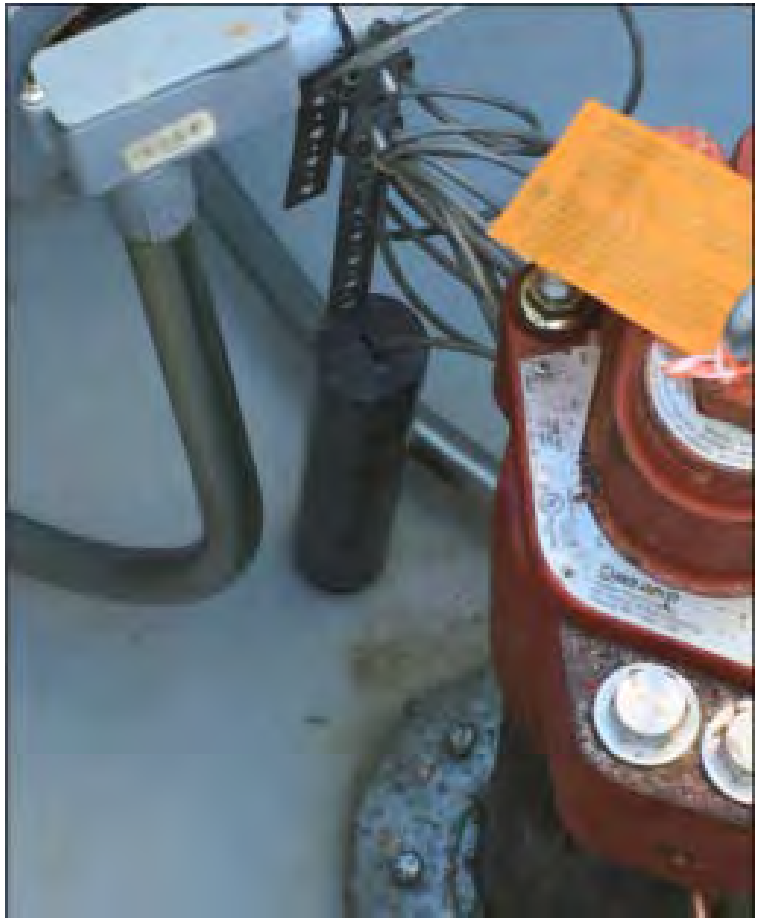
With Containment

With Containment

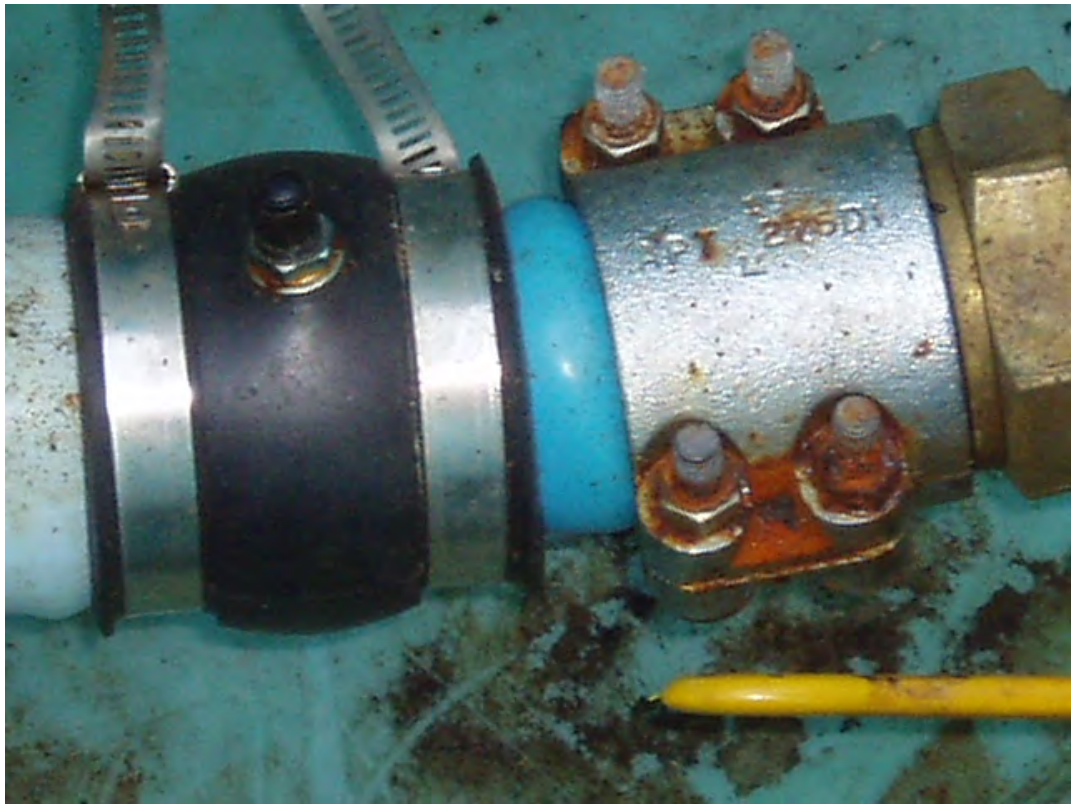
- Penetration fittings intact and in good condition (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)

With Containment

- Sump Sensor is < 2” from lowest point (N/A if not conducting interstitial monitoring)



With Containment



- Piping interstitial space is open to the sump (Open systems only, N/A if closed system or not conducting interstitial monitoring)

With Containment

- Sump lid, gasket and seals present and in good condition

With Containment

WITH CONTAINMENT	Sump is dry and does not contain product and/or water	Pass
	Sump walls/bottom are not damaged (i.e., cracks, bulges, holes, etc.) (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)	Pass
	Penetration fittings intact and in good condition (If conducting sump/interstitial monitoring then any failing item must be repaired. Repair is optional if not conducting sump/interstitial monitoring)	Fail
	Sump Sensor is < 2" from lowest point (N/A if not conducting interstitial monitoring)	N/A
	Piping interstitial space is open to the sump (Open systems only, N/A if closed system or not conducting interstitial monitoring)	N/A
	Sump lid, gasket and seals present and in good condition	Pass

Form UST-22C

- Mark each box with a Pass, Fail or N/A for each sump
- If **Fail**, indicate what action was taken to repair the containment sump or faulty equipment in the comment portion of this form **or** attach documentation of any repairs.
- Repair of containment sump is optional if not conducting sump/interstitial monitoring

Form UST-22C

- If the sump contains a regulated substance or there are other indications of a release of a regulated substance, it must be reported as a suspected release using the UST-17A form, UST Suspected Release 24 Hour Notice.

Form UST-6D/23A

- Triennial UST Spill Bucket Integrity Testing

- First Testing must be completed prior to **October 13, 2018** (for spill buckets installed prior to November 1, 2007)

UST-6D/23A Triennial UST Spill Bucket Integrity Testing

Insert Page | Delete Page | Lock Form Data Entry

- If any periodic test fails, a suspected release report must be submitted on a UST-17A form, *UST Suspected Release 24 Hour Notice*. The suspected release must be investigated, in accordance with 15A NCAC 2N .0603, and defective equipment repaired or replaced in accordance with 15A NCAC 2N .0404/.0900. Results of the investigation must be submitted on a UST-17B form, *UST Suspected Release 7 Day Notice*.
- The primary containment and interstitial space of the spill bucket shall be tested in accordance with the manufacturer's written guidelines, PEI/RP100 "Recommended Practices for Installation of Underground Liquid Storage Systems" and/or PEI/RP1200 "Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities."
- The primary and secondary walls are both considered to be tested at the same time if vacuum is used to test the interstice.

UST FACILITY

Owner / Operator Name	Facility Name	Facility ID
Facility Street Address	Facility City	County

CONTRACTOR/PERSON CONDUCTING INSPECTIONS

Company Name	Phone	Email address

I certify, under penalty of law, that the testing data provided on this form documents the UST system equipment was checked in accordance with the manufacturer's guidelines and the applicable national industry standards listed in 15A NCAC 2N .407/.0501 and/or 15A NCAC 2N .0900.

Print Name of person conducting inspection	Signature of person conducting inspection	Inspection Date

Identify Spill Bucket *(By Tank Number, Stored Product, etc.)*	Tank #	Tank #	Tank #	Tank #	Tank #
Tank Size					

Form UST-6D/23A

All spill buckets must now be tested

- Primary containment
- Interstitial space of double walled buckets (only if conducting interstitial monitoring)

Form UST-6D/23A

Must be tested in accordance with:

- **Manufacturer's written guidelines**,
- **PEI/RP100** “Recommended Practices for Installation of Underground Liquid Storage Systems” and/or
- **PEI/RP1200** “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities.”

Form UST-6D/23A

- Visual inspection
- Vacuum test
  - 30” WC on primary, 15” WC on secondary
  - Primary and Secondary are considered tested at same time if used to test interstice.
- Hydrostatic test
  - Water level must be within 1.5” of the top of the bucket

Form UST-6D/23A

- Each section should be filled out for every tank.
- Mark if Spill Bucket has a liner, or make note in comments
- If tank has multiple spill buckets, list each separately.
- Spill Buckets installed after 11/1/07 must have both primary and secondary spaces tested.

Form UST-6D/23A

- Pass/Fail Criteria
  - Must pass visual inspection
  - Hydrostatic test – water level drop of less than 1/8” in 1 hour
  - Vacuum (single walled) – maintain at least 26” water column for 1 minute
  - Vacuum (double walled) – maintain at least 12” water column for 1 minute

Form UST-6D/23A

- Any Fail is considered a suspected release and should be investigated. (UST-17A & 17B must be submitted)
- Failed equipment must be repaired according to manufacturer's instructions or replaced.
  - Must use approved liner
  - New Spill Buckets must be double walled and interstitially monitored.

Form UST-6F/23B

- Triennial UST Containment Sump/UDC Integrity Testing
  - Containment Sumps used for Interstitial Monitoring

- First Testing must be completed prior to **October 13, 2018** (for sumps installed prior to November 1, 2007)

UST-6F/23B

Insert Page | Delete Page

Triennial UST Containment Sump / UDC Integrity Testing

Lock Form Data Entry

- If any periodic test fails, a suspected release report must be submitted on a UST-17A form, *UST Suspected Release 24 Hour Notice*. The suspected release must be investigated, in accordance with 15A NCAC 2N .0603, and defective equipment repaired or replaced in accordance with 15A NCAC 2N .0404/.0900. Results of the investigation must be submitted on a UST-17B form, *UST Suspected Release 7 Day Notice*.
- Containment sumps installed on or after 11/1/2007 that are not monitored continuously for releases using vacuum, pressure, or hydrostatic interstitial monitoring methods and all other containment sumps installed prior to 11/1/2007 that are used for interstitial monitoring shall be tightness tested at installation and every three (3) years thereafter in accordance with the manufacturer's written guidelines, PEI/RP100 "Recommended Practices for Installation of Underground Liquid Storage Systems" and/or PEI/RP1200 "Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities."
- If a UDC / containment sump fails a periodic tightness test, the sump must be replaced or repaired by the manufacturer, or the manufacturer's authorized representative in accordance with the manufacturer's specifications.

UST FACILITY

Owner / Operator Name	Facility Name	Facility ID
Facility Street Address	Facility City	County

CONTRACTOR/PERSON CONDUCTING INSPECTIONS

Company Name	Phone	Email address

I certify, under penalty of law, that the testing data provided on this form documents the UST system equipment was checked in accordance with the manufacturer's guidelines and the applicable national industry standards listed in 15A NCAC 2N .406 and/or 15A NCAC 2N .0900.

Print Name of person conducting inspection	Signature of person conducting inspection	Inspection Date

Identify UDC/sump *(By Dispenser No. or Tank Number, Tank Size, Stored Product; e.g. #1 10k Regular STP, Disp 1/2, etc.)*	☐ Dispenser ☐ Tank # #:	☐ Dispenser ☐ Tank # #	☐ Dispenser ☐ Tank # #	☐ Dispenser ☐ Tank # #	☐ Dispenser ☐ Tank # #	☐ Dispenser ☐ Tank # #

Form UST-6F/23B

Containment sumps installed on or after 11/1/2007 that are not monitored continuously for releases using vacuum, pressure, or hydrostatic interstitial monitoring methods and all other containment sumps installed prior to 11/1/2007 that are used for interstitial monitoring shall be tightness tested at installation and every three (3) years thereafter

Form UST-6F/23B

Must be tested in accordance with:

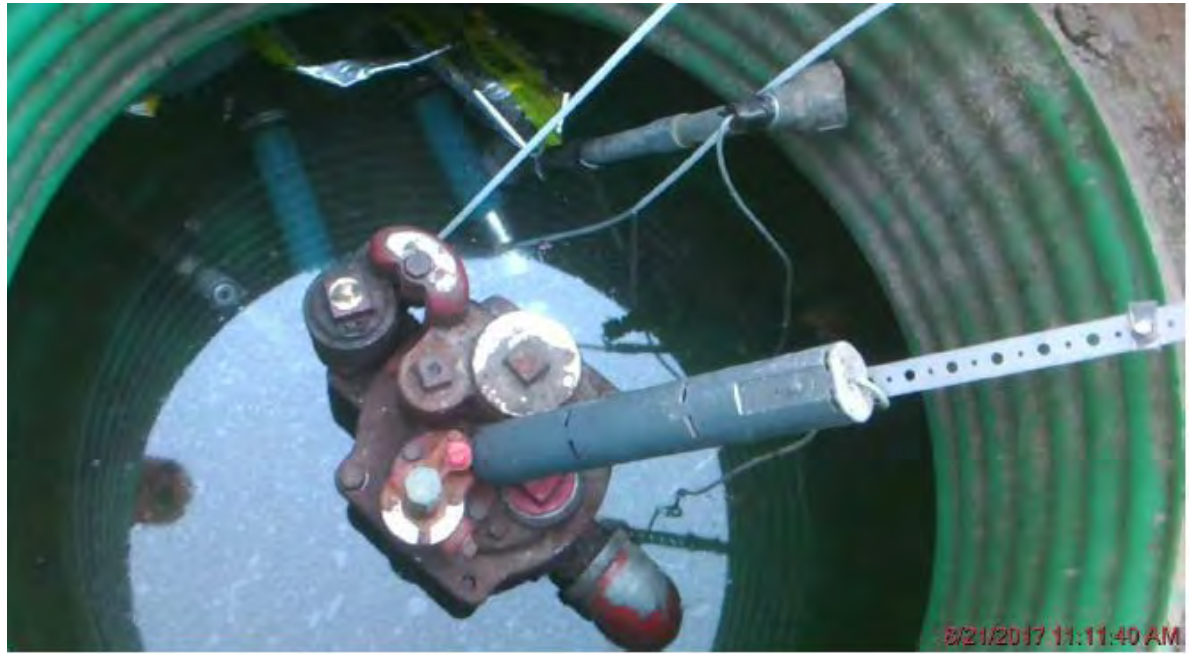
- **Manufacturer's written guidelines**,
- **PEI/RP100** "Recommended Practices for Installation of Underground Liquid Storage Systems" and/or
- **PEI/RP1200** "Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities."

Form UST-6F/23B

- Visual Inspection
- Hydrostatic or Vacuum test
- Measure sump depth
- Measure height from bottom of sump to highest penetration or seam
  - Test level must be at least 4” above this measurement
- Each section should be filled out for every sump/dispenser.

Form UST-6F/23B

- Enter Begin and End Times
  - Minimum test time – 1 hour
- Enter Begin and End test values
- Mark Pass or Fail for each sump
- Be sure to put sump sensor back into lowest point



Form UST-6F/23B

- Pass/Fail Criteria
  - Visual Inspection must pass
  - Hydrostatic test – water level drop of less then 1/8”
  - Vacuum test – no change in vacuum

Form UST-6F/23B

- Any Fail is considered a suspected release and should be investigated. (UST-17A & 17B must be submitted)
- Failed equipment must be repaired according to manufacturer's instructions or replaced.
  - New sumps must be monitored using sensors

Wrap up

- Forms
  - https://deq.nc.gov/about/divisions/waste-management/ust/forms

Wrap up

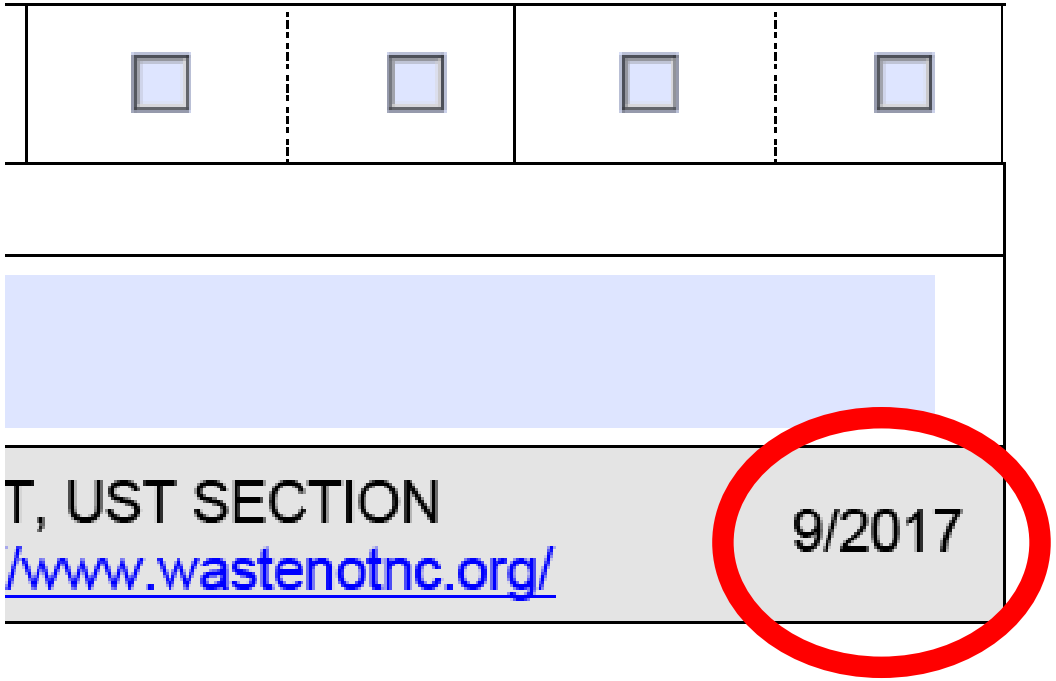
- Make sure the most recent version of the form is used
  - Check website for most recent versions

	Permits and Inspection	Revision Date	PDF	DOC
UST-24	Certification of No Visible Corrosion on Metallic Piping Components	10/2015		
UST-27	Monthly Walkthrough Inspections	2/2018		

Department of Environmental Quality

Wrap up

- Make sure the most recent version of the form is used
  - Check website for most recent versions



Questions?

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  - gina.williams@ncdenr.gov or 910-567-5683
- Kevin Fite
  - kevin.fite@ncdenr.gov or 704-528-4748
- UST Section Central Office
  - 919-707-8171