

Shop-Fabricated Aboveground Storage Tank Inspections – Expect the Unexpected...



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Jobsite Safety Analysis

- Identify your workspace
 - What are the hazards you will encounter?
 - What activities are happening around you that are not part of your work?
 - Where is the nearest:
 - First Aid Kit
 - Water Source (eye wash/emergency shower)
- Emergency Shut Off Switch - must be at least 20' away but no more than 100' away



Emergency Planning

- **List of emergency contacts for the facility...**
 - Names
 - Facility Phone Numbers
 - Bring Mobile Phone
 - Rally Point?
 - Does 911 work here?
 - Is there an urgent care center nearby?



General Workplace Safety

- Always have drinking water on hand – stay hydrated
- Environmental hazards
 - Heat Stress
 - Frostbite
 - Lightning
 - Sunburn
- Watch out for Critters...



Spiders



Bees, Wasps and Hornets





Snakes...





In the
Northwest
Territories...





In Florida...

General Workplace Safety

- Review Jobsite Safety Analysis
- Make sure you have all required Personal Protective Equipment based upon the hazards anticipated
 - Safety vest
 - Eye protection/safety glasses
 - Protective shoes
- Define your workspace
 - Set out cones, hazard tape, etc. as needed to limit access to the area while you are working
 - Park vehicles to help provide barriers



Hazardous Conditions

- Threats when working around Flammable and Combustible Liquids
 - Fire & Explosions
 - Suffocation
 - Chemical burns
- Material Safety Data Sheets (MSDS) should be in hand at the owner's site.



What Happens When You Don't Have a Fire Extinguisher...





Supports for tanks > 12" high
must have a fire resistance
rating of 2 hours

What's Wrong with these Tanks?



Dike-field Secondary Containment

- Dike or wall must be at least 5' from tank
- Dike must be at least 10' from property line
- Should be constructed to handle a 25 year – 24 hour storm event



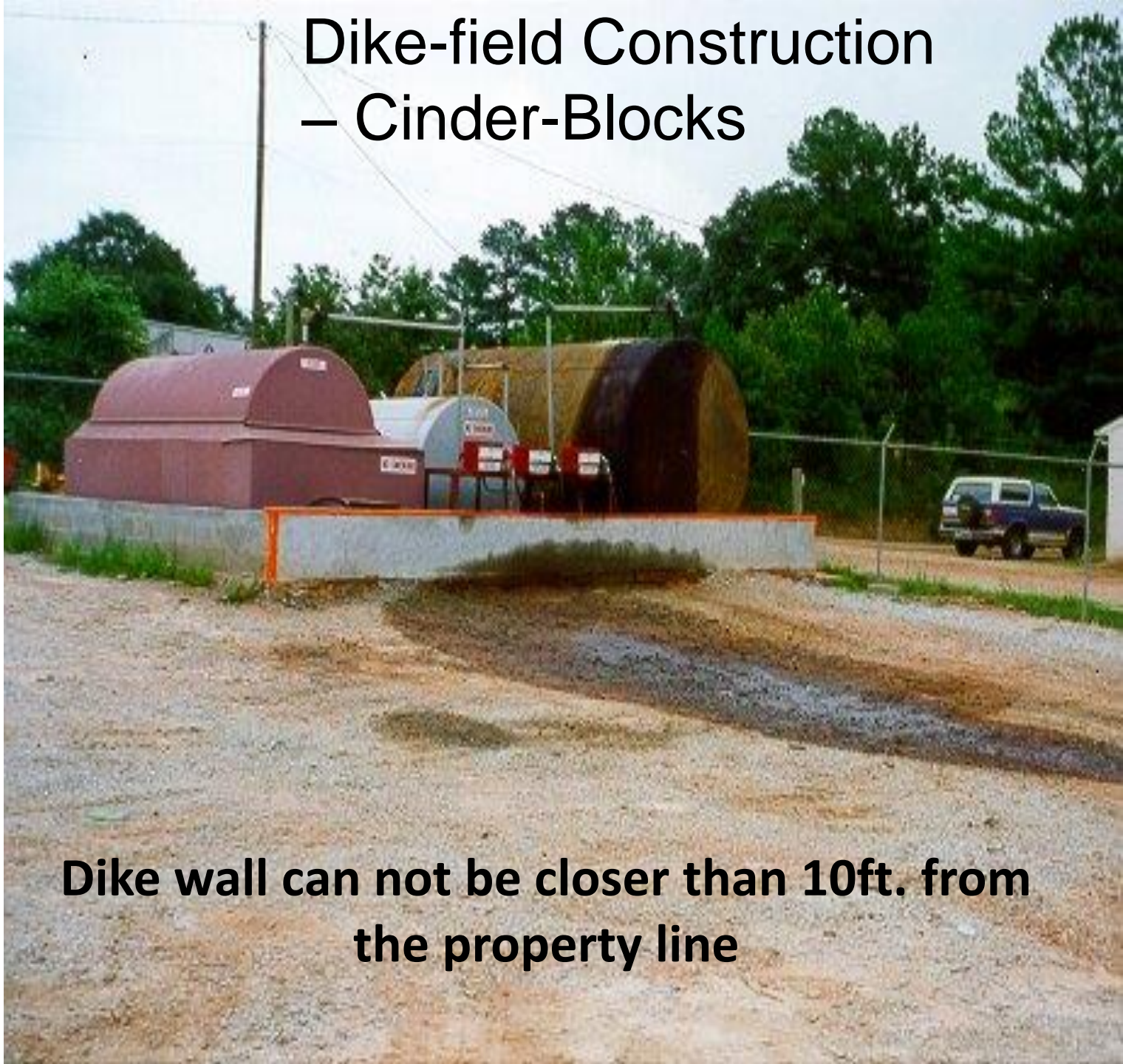
If an RPB, must be “sufficiently impervious”

Earthen Dike- Field...With a Problem



APR 15 2003

Dike-field Construction – Cinder-Blocks



**Dike wall can not be closer than 10ft. from
the property line**

There should be at least three feet between the tank and the Dike-wall



Single-wall Tanks
Must be at Least
100 ft. from the
Property Line



21 ft. to property line





Anything
wrong here?

Power lines shall maintain a 10 foot horizontal separation from tank shell





FLAMESHIELD

Tested to NFPA 30A-2000
Fire-Resistant Tank
Requirements



All nozzle penetrations must
be on the top of the
tank for secondary
containment compliance



No Anti-Siphon Valves

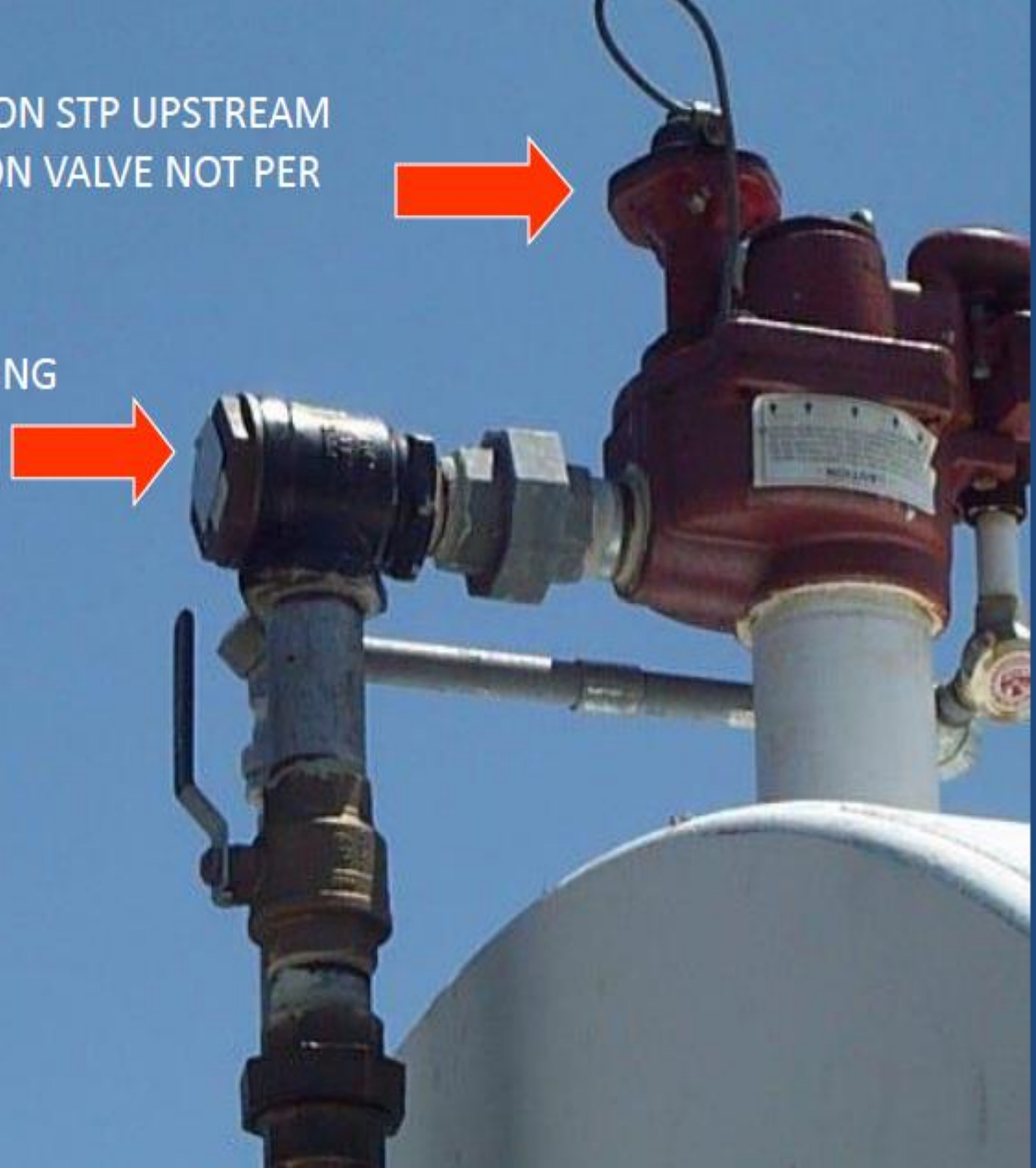


Sometimes it gets a
little complicated...



MLLD INSTALLED ON STP UPSTREAM
FROM ANTI SIPHON VALVE NOT PER
PEI/RP 200-96.

MORRISON 910-ER SPRING
LOADED CHECK ANTI-
SIPHON VALVE



Line-Leak Detector installed incorrectly upstream



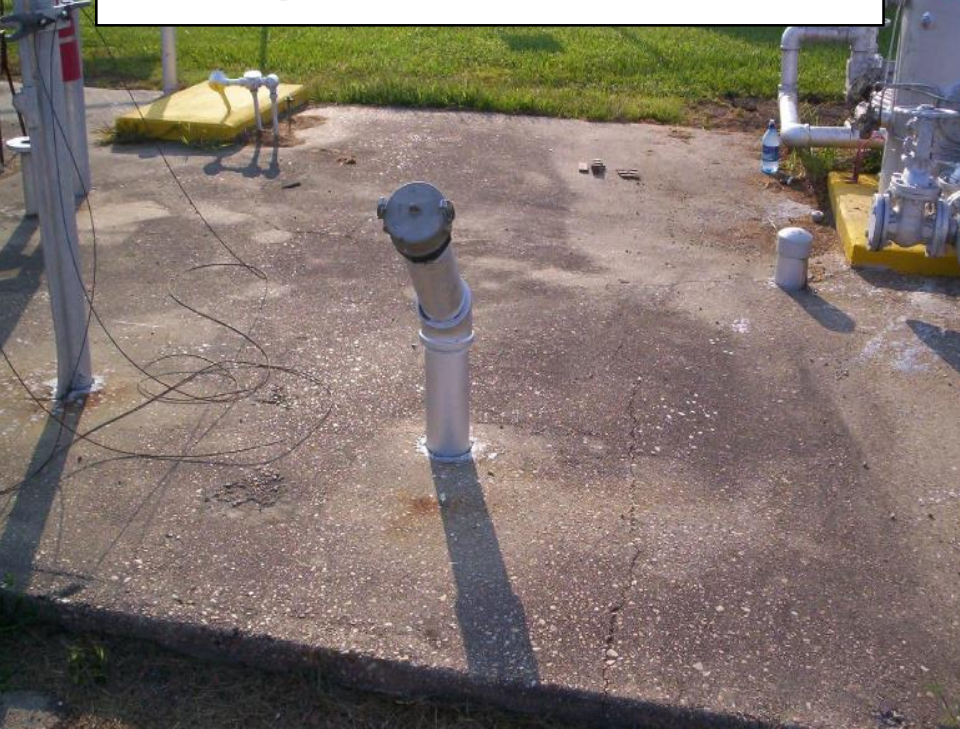
Line-Leak Detector installed correctly
here...



No Spill Containment



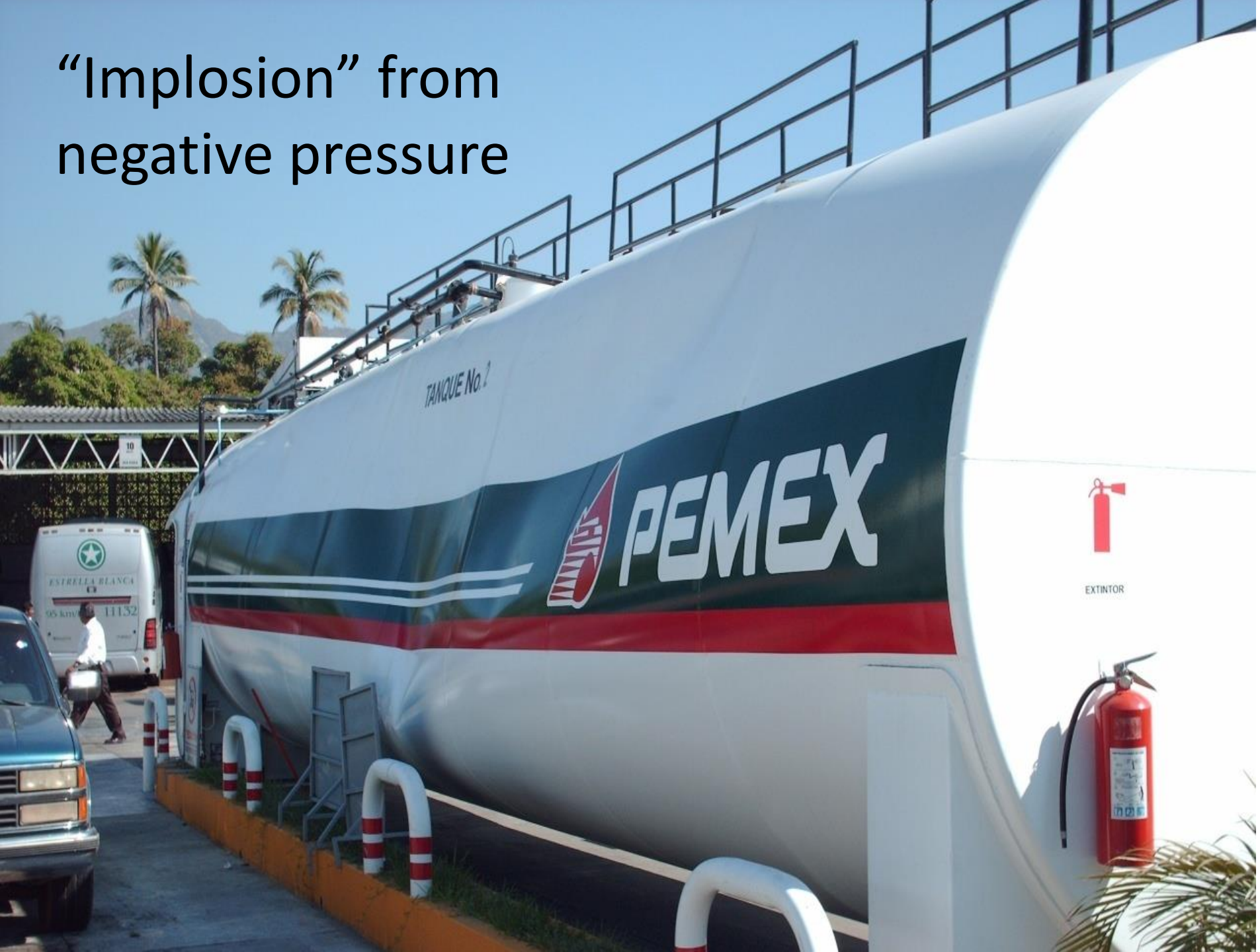
Spill Containment



A large, horizontally-oriented cylindrical metal tank, possibly a storage vessel, is shown. The end cap is severely distorted, with significant buckling and cracking, indicating a failure due to over-pressurization. The tank is supported by a metal structure. The background shows green trees and a clear sky. The text "Over pressurization" is overlaid on the image.

Over pressurization

“Implosion” from
negative pressure



Manway
Tank Gauge

No Emergency Venting
No Atmospheric Vent

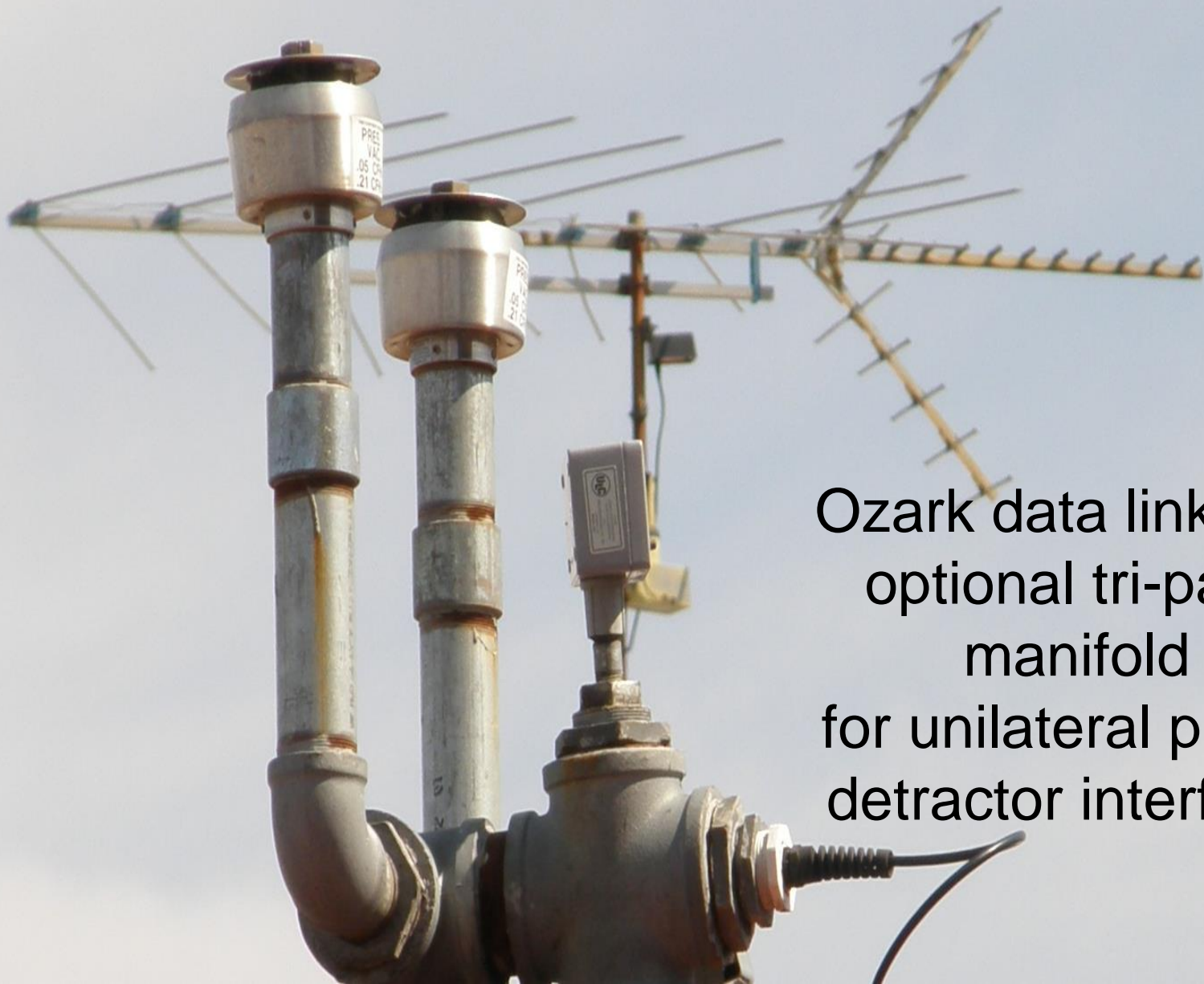


$\frac{3}{4}$ in. atmospheric vent.



Must never be
less than one
and a quarter
inches

From John Albert in the Ozarks...



Ozark data link with optional tri-pack manifold for unilateral phase detractor interface.

Long-bolt Man-way Vent Non-functional





Obstructed Long-bolt
Man-way Vents

Ice cream scoops work well for blocking
Emergency vents open



A photograph showing a white cylindrical vent pipe on a roof. The pipe has a rusted metal cap. To the right of the pipe is a weathered electrical outlet with a white cover. Below the outlet is a broken pipe flange with a jagged, rusted edge. The roof surface is light-colored and shows signs of wear. The background consists of green foliage and a road.

Deception

Emergency Venting Deception

Deception





Deception



Deception

21 12:39 PM



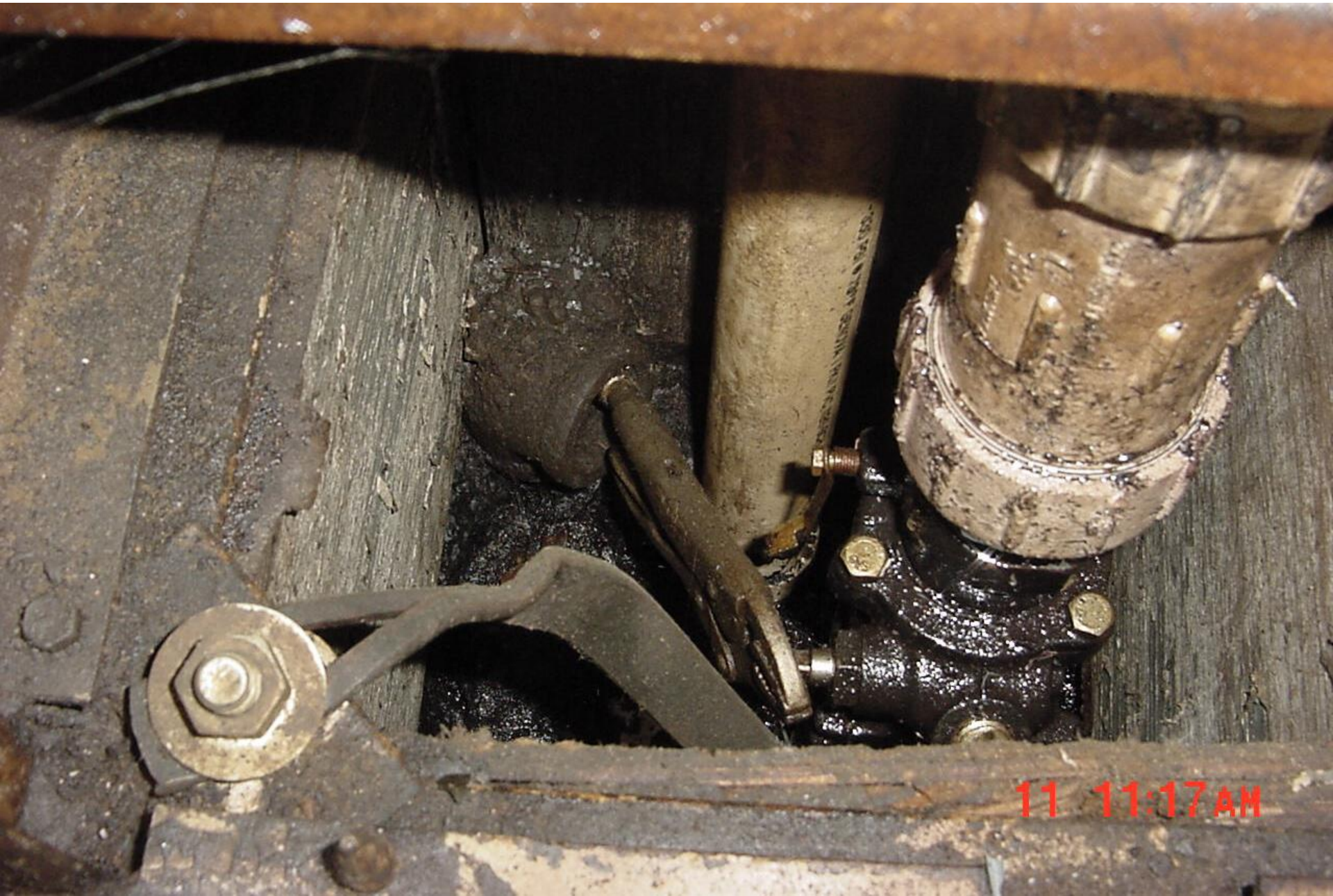
Excellent
attempt at
making caulk
look like a
weld

21 12:38 PM

Duct tape E-vents must be replaced every 30 days unless clearly marked “industrial grade”



Shear valves required with a pressurized system



11 11:17 AM



Repairs

Hickory Plug



Side of Tank Near Dike-Wall



Tank Top



Shop-fabricated Tank Discharges



Suspected Releases



Confirmed Releases

Suspected
Releases



27 3:17 PM

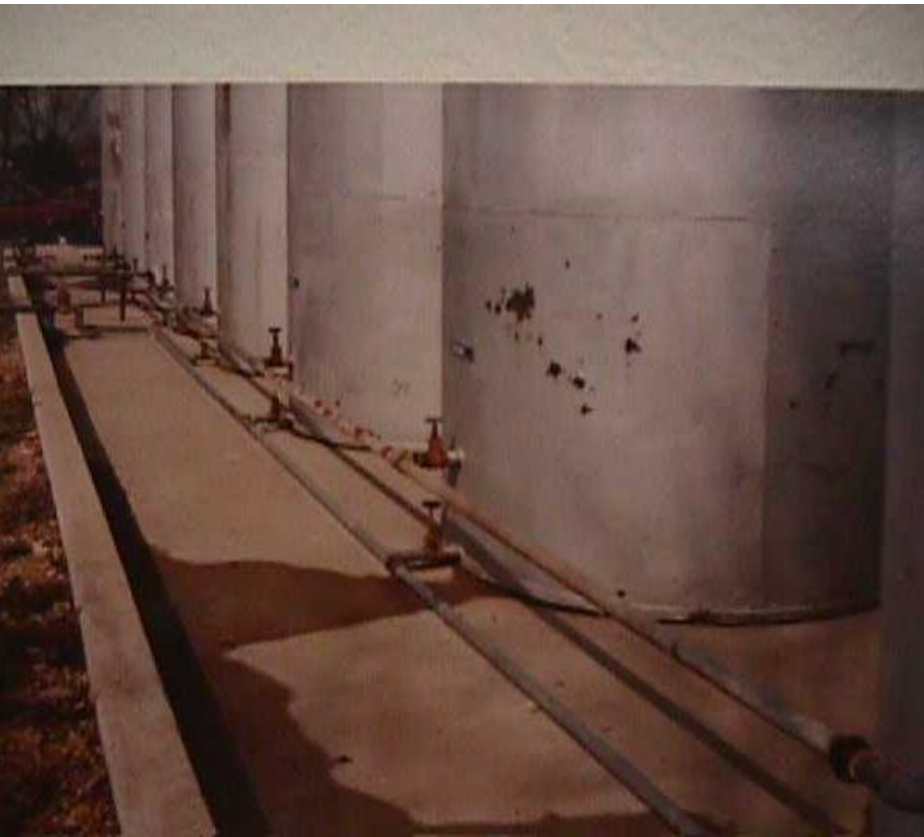
Confirmed Releases



Release Response

Tank bottom leak that remains in the dike-field - incident

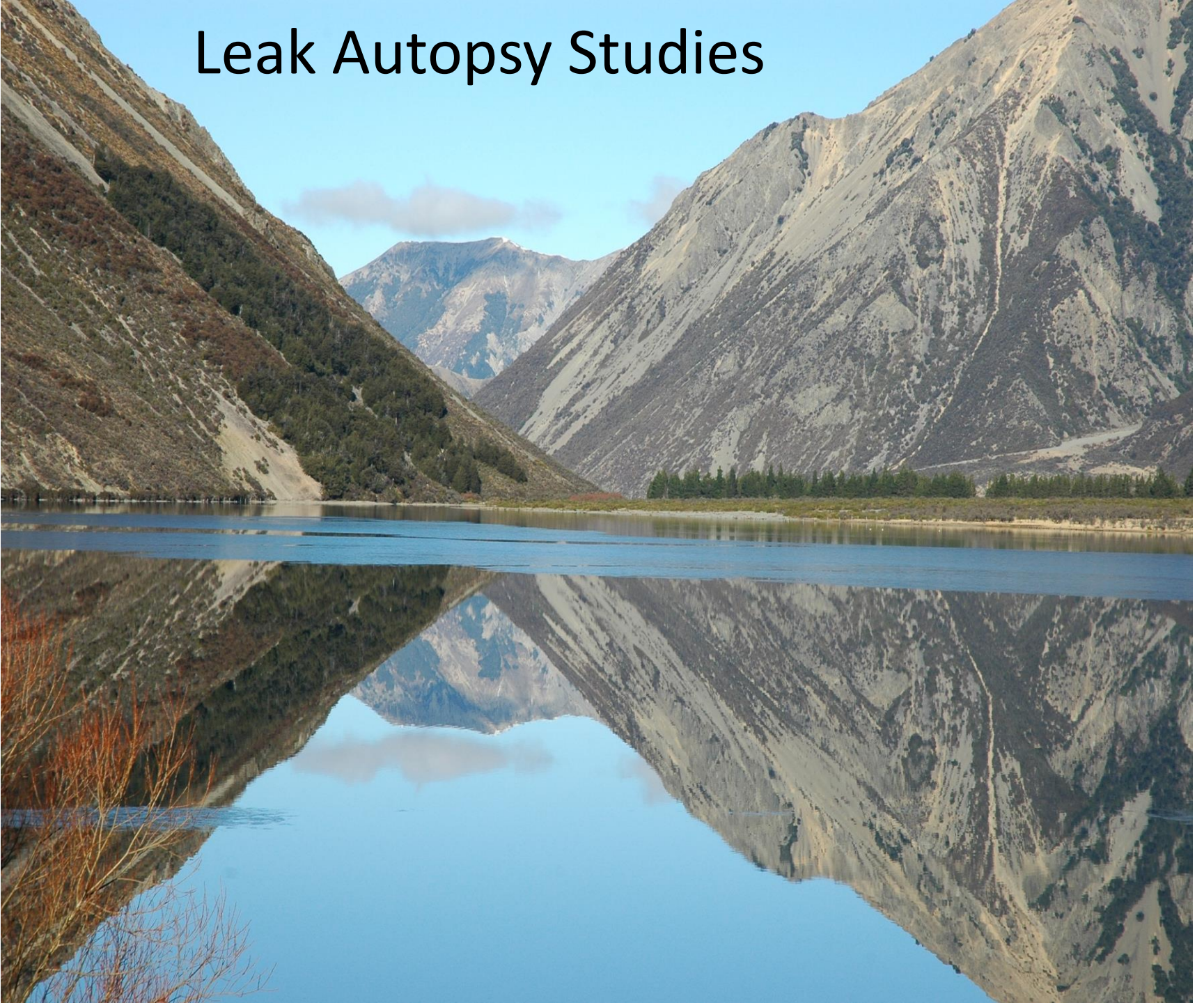
Overfill outside of the dike-field - discharge requiring remediation



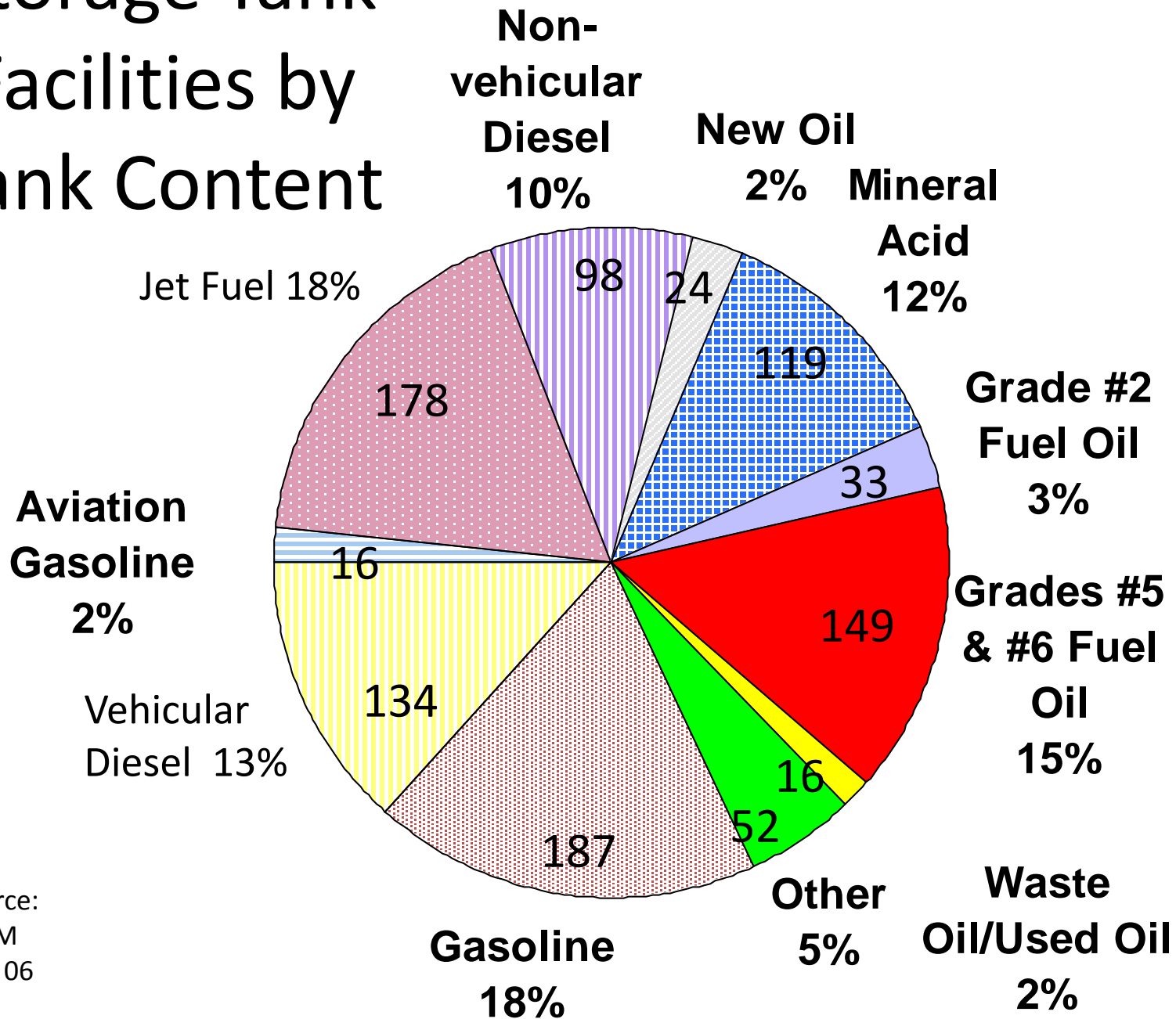


Out-of-Service, Closure, and Closure Assessments

Leak Autopsy Studies

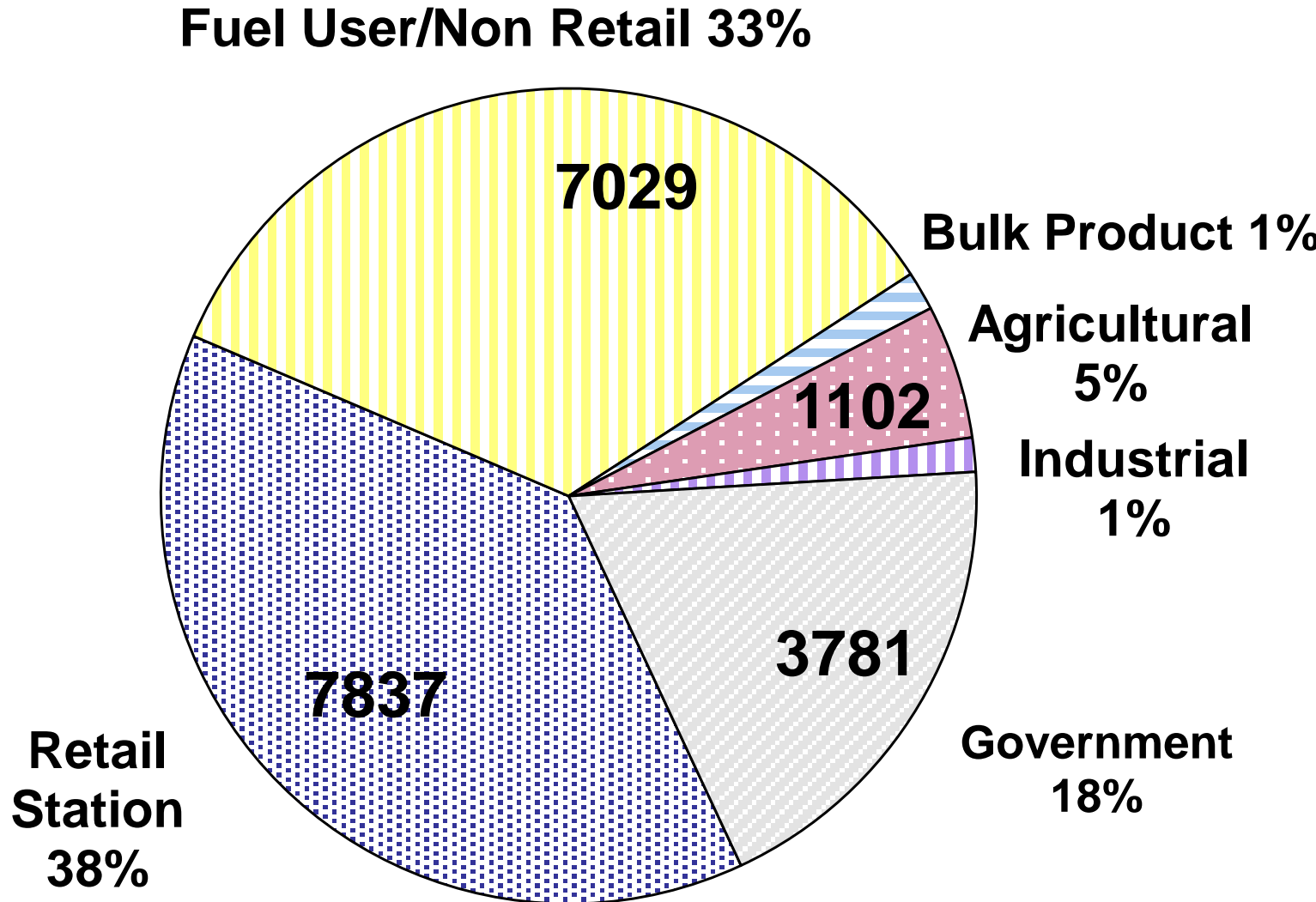


Storage Tank Facilities by Tank Content



Source:
STCM
Nov 06

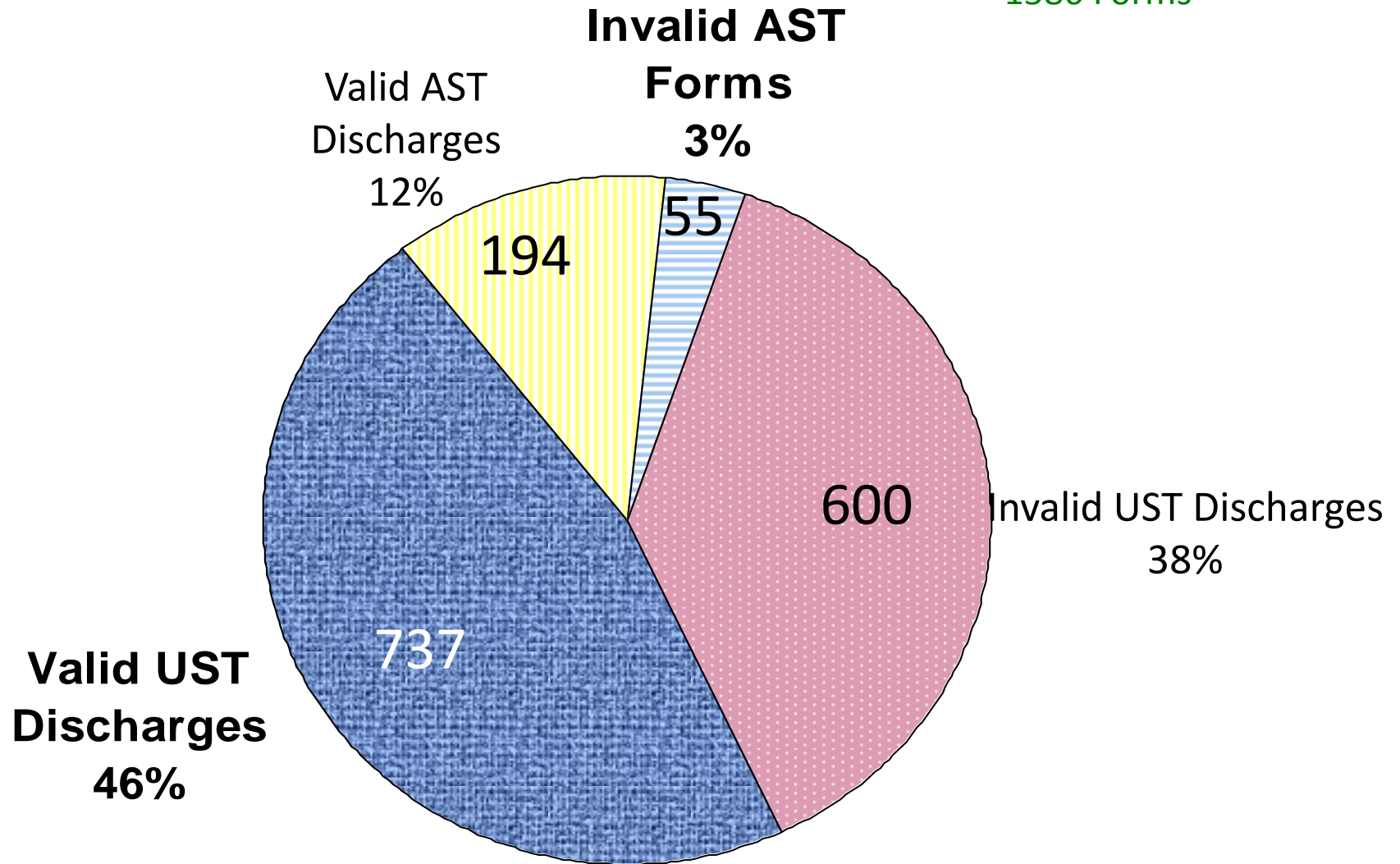
Storage Tank Ownership by Facility Type 2009 – ASTs & USTs



Source:
STCM
Apr 09

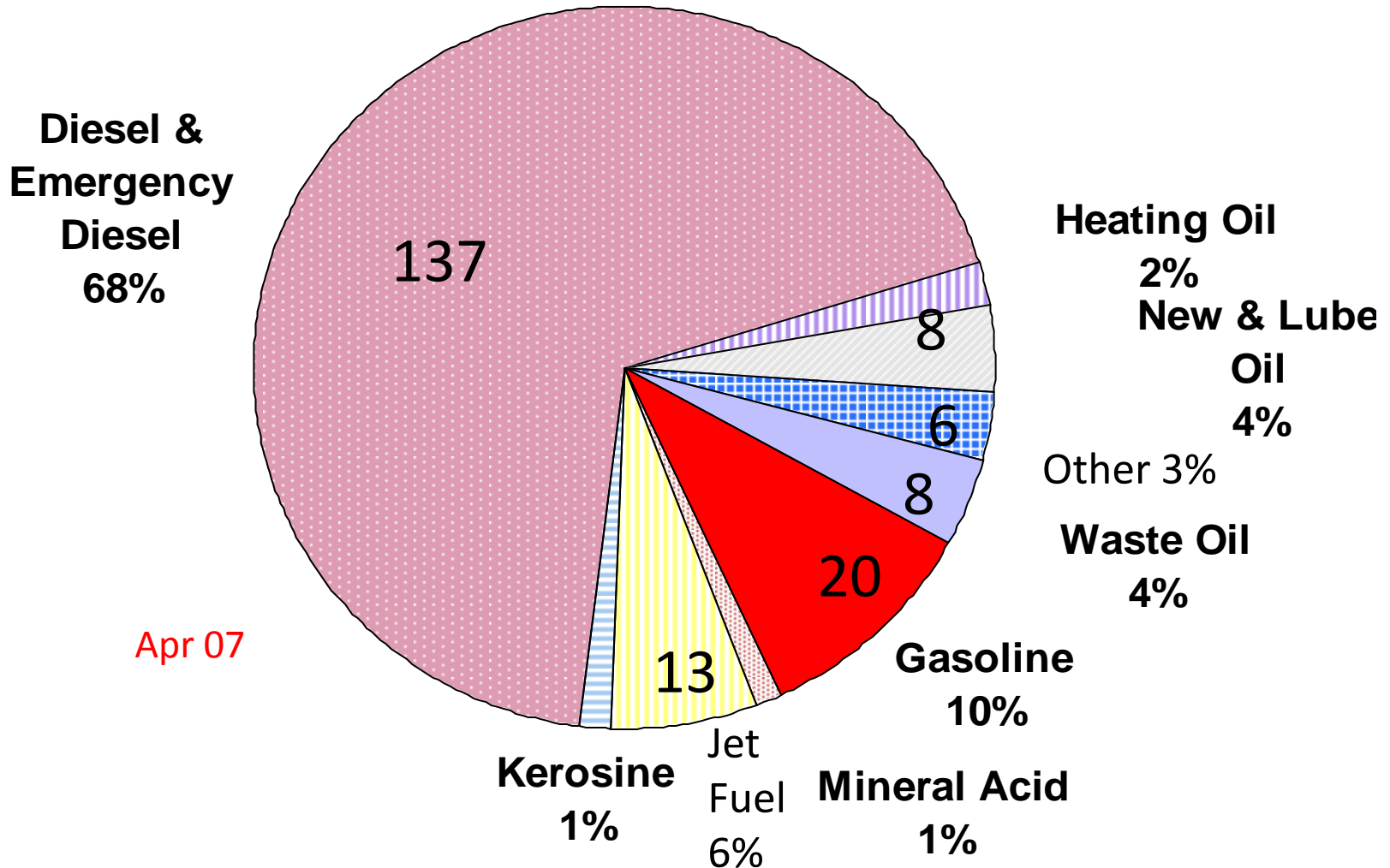
Florida Leak Autopsy Forms 1 Jan 03 – 10 Mar 08

1586 Forms



- Required for all new discharges after January 1, 2003

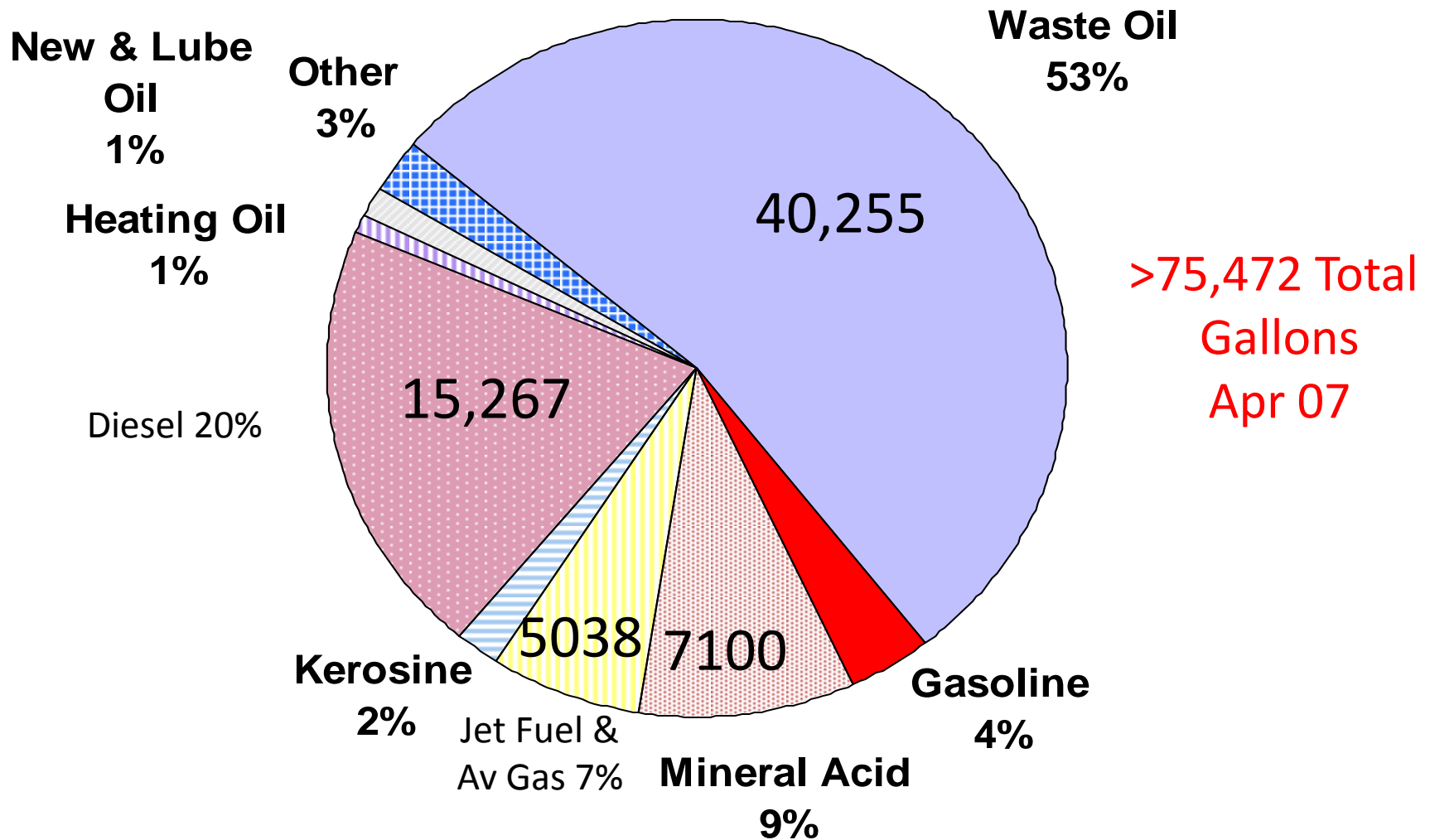
Percent of Discharges by Product Type



Apr 07

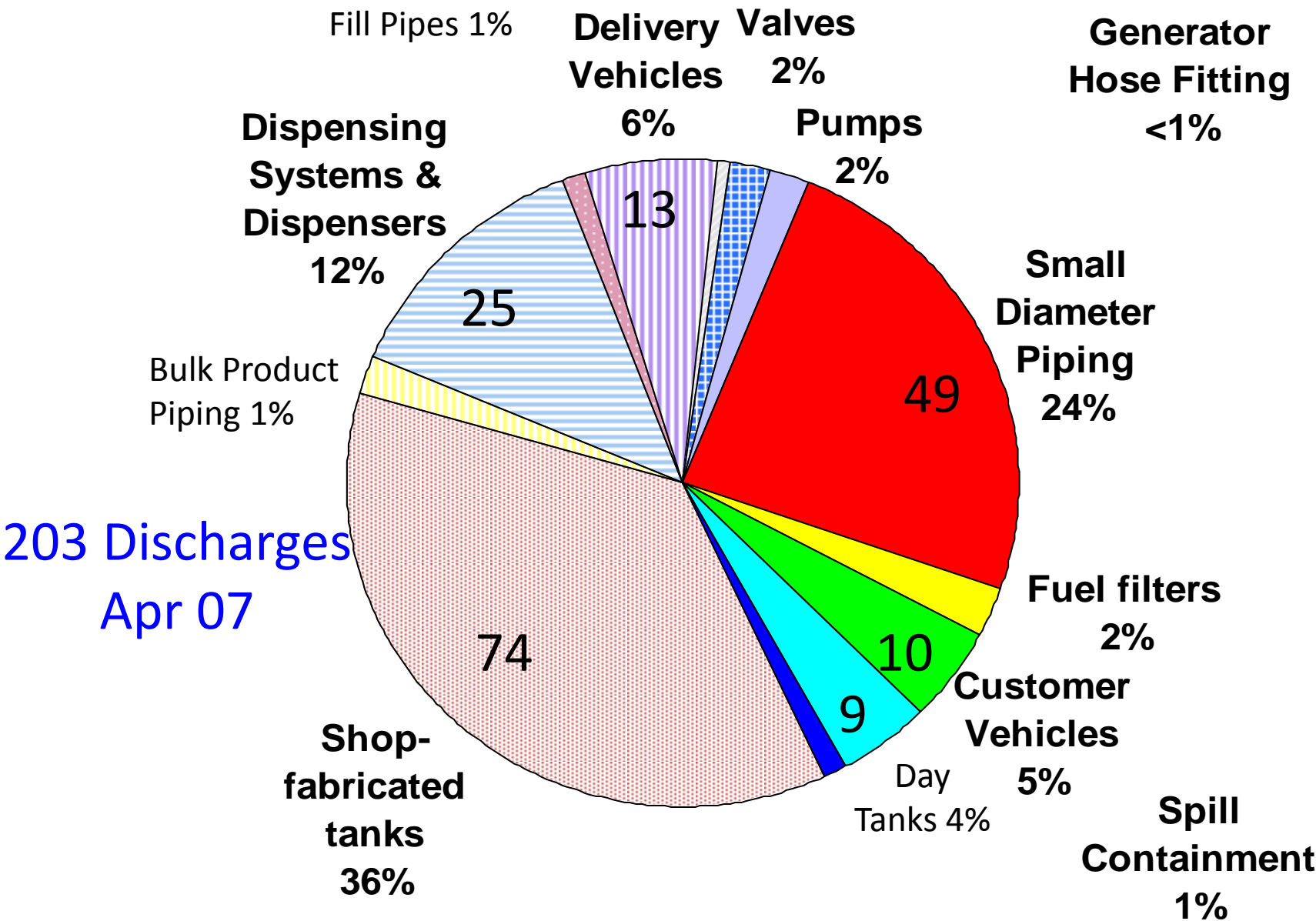
Shop-fabricated AST Systems

Percent of Estimated Gallons Discharged by Product Type



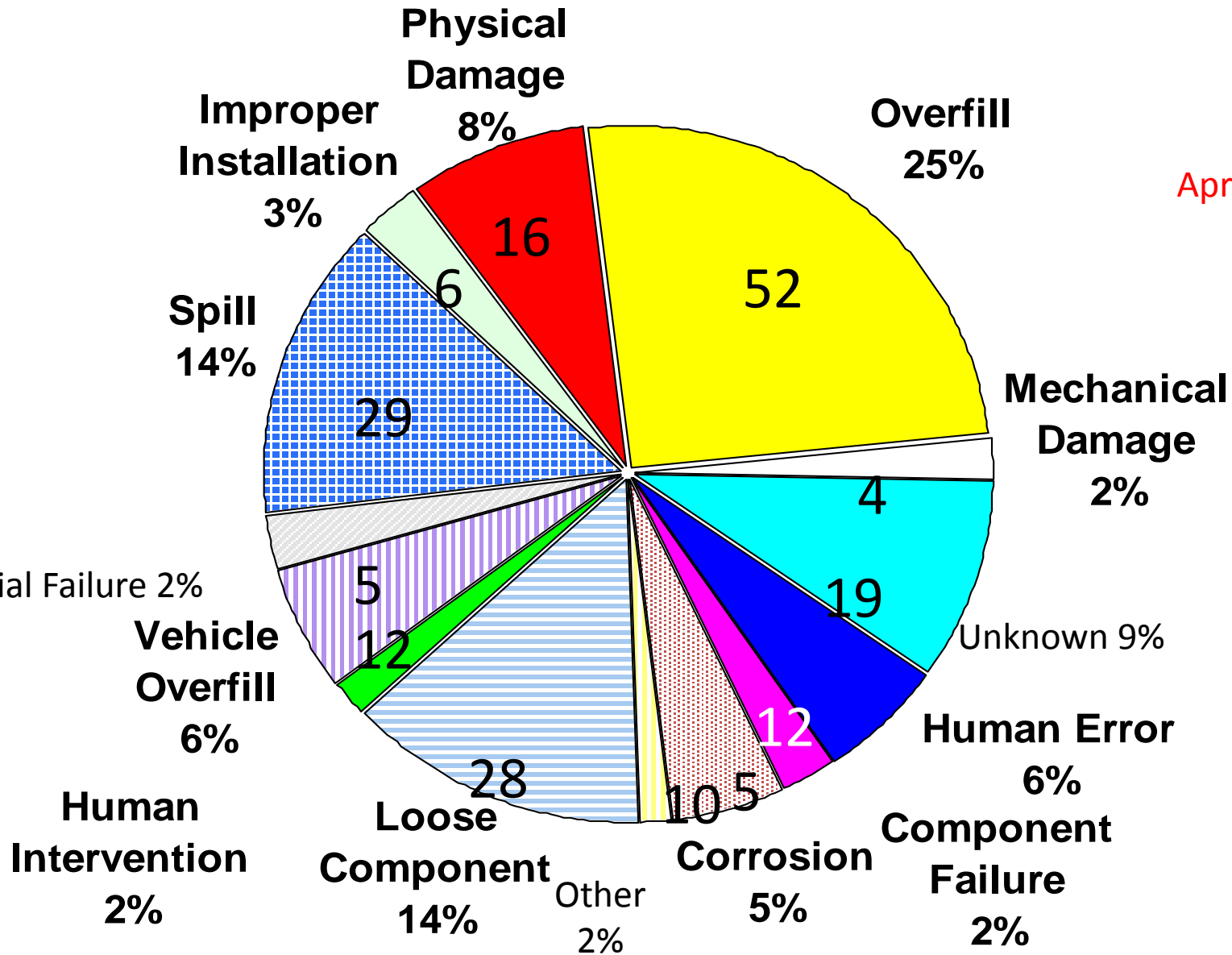
Shop-fabricated AST Systems

Sources of Discharges - Shop-fabricated ASTs



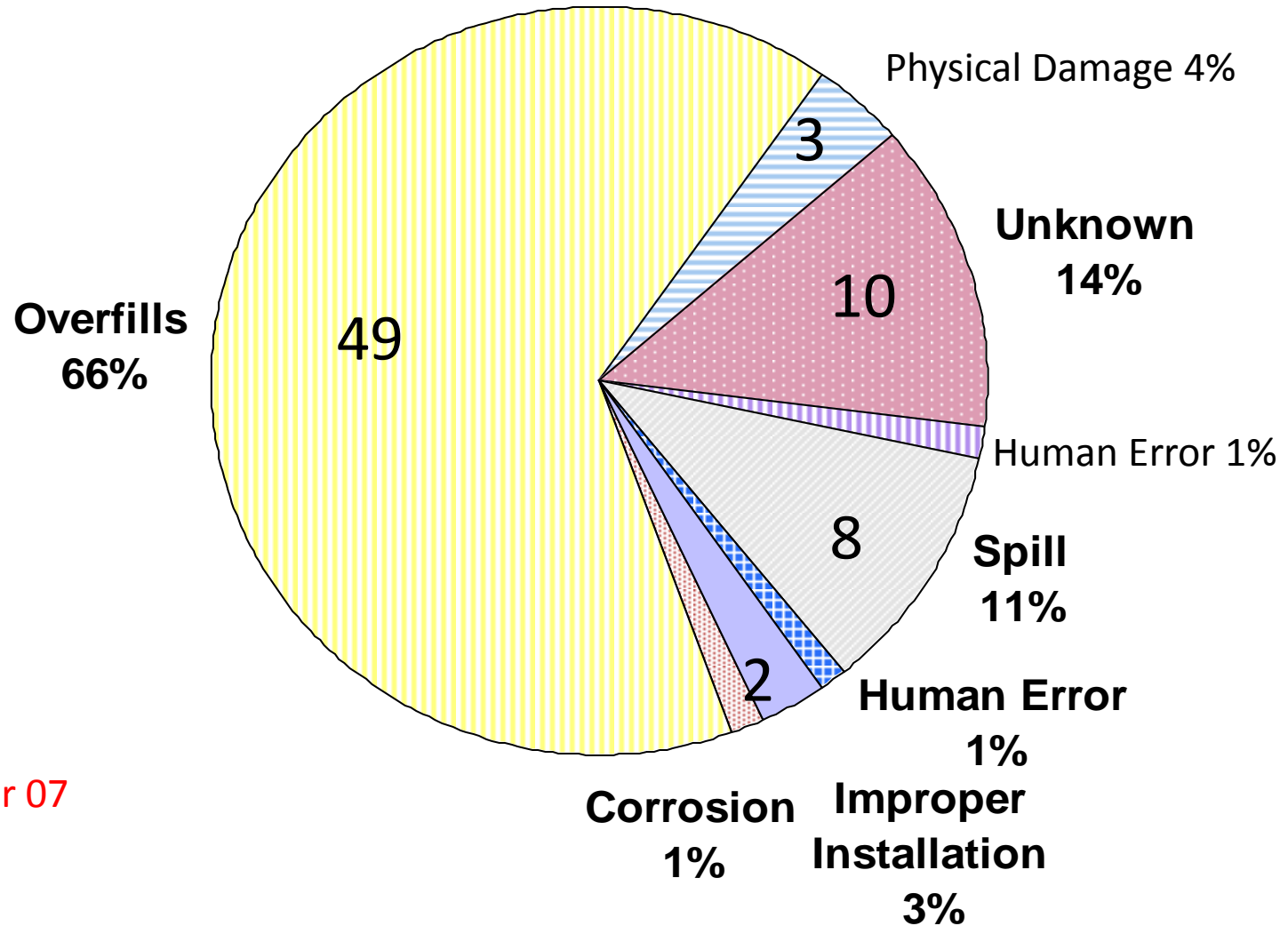
Causes of Discharges from All Sources

Apr 07



Shop-fabricated AST Systems

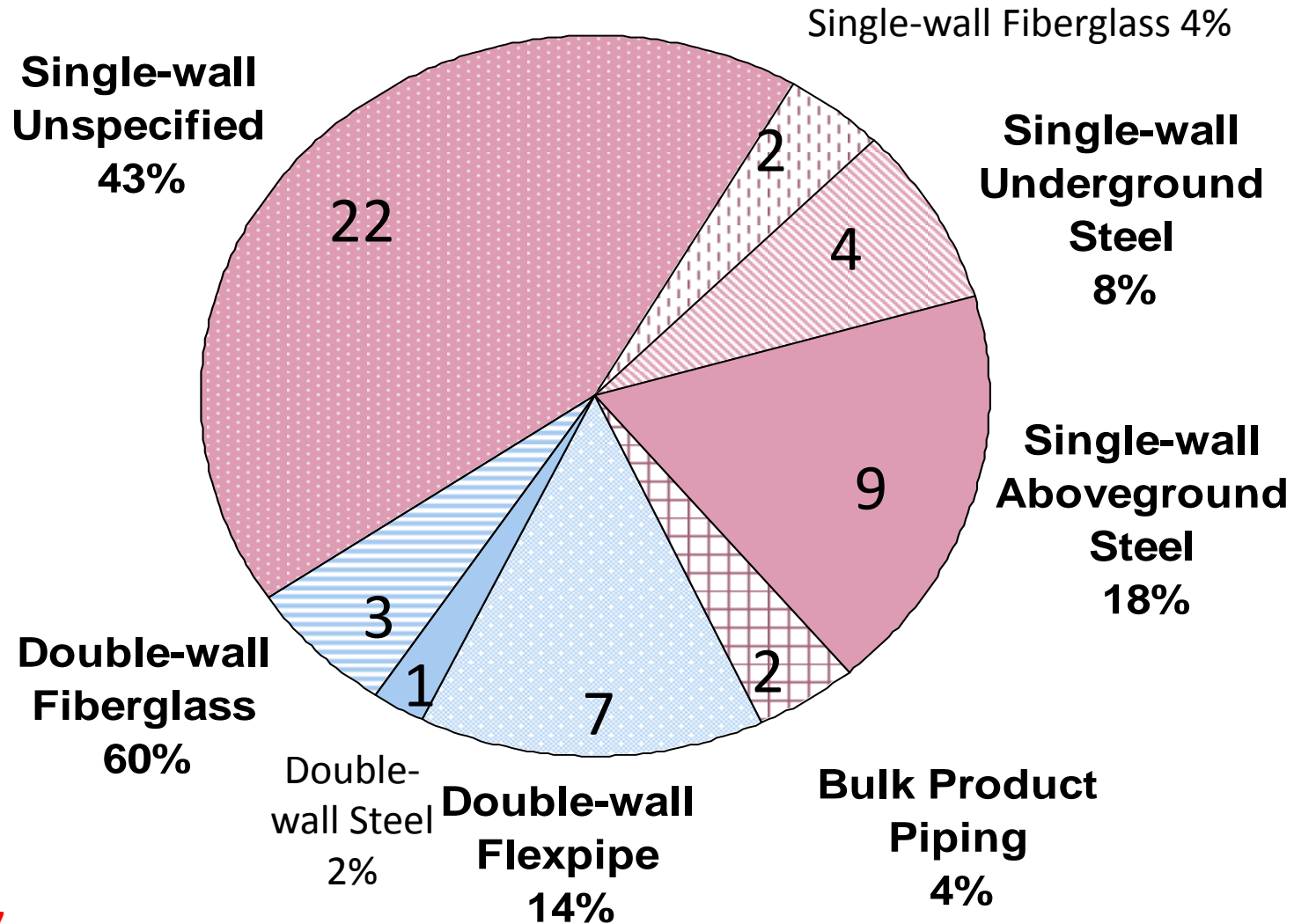
Causes of Discharges from Tanks



Apr 07

Shop-fabricated AST Systems

Causes of Discharges from Piping, Different Types of Piping

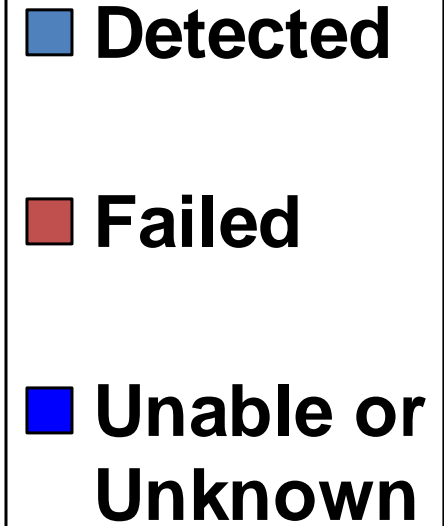
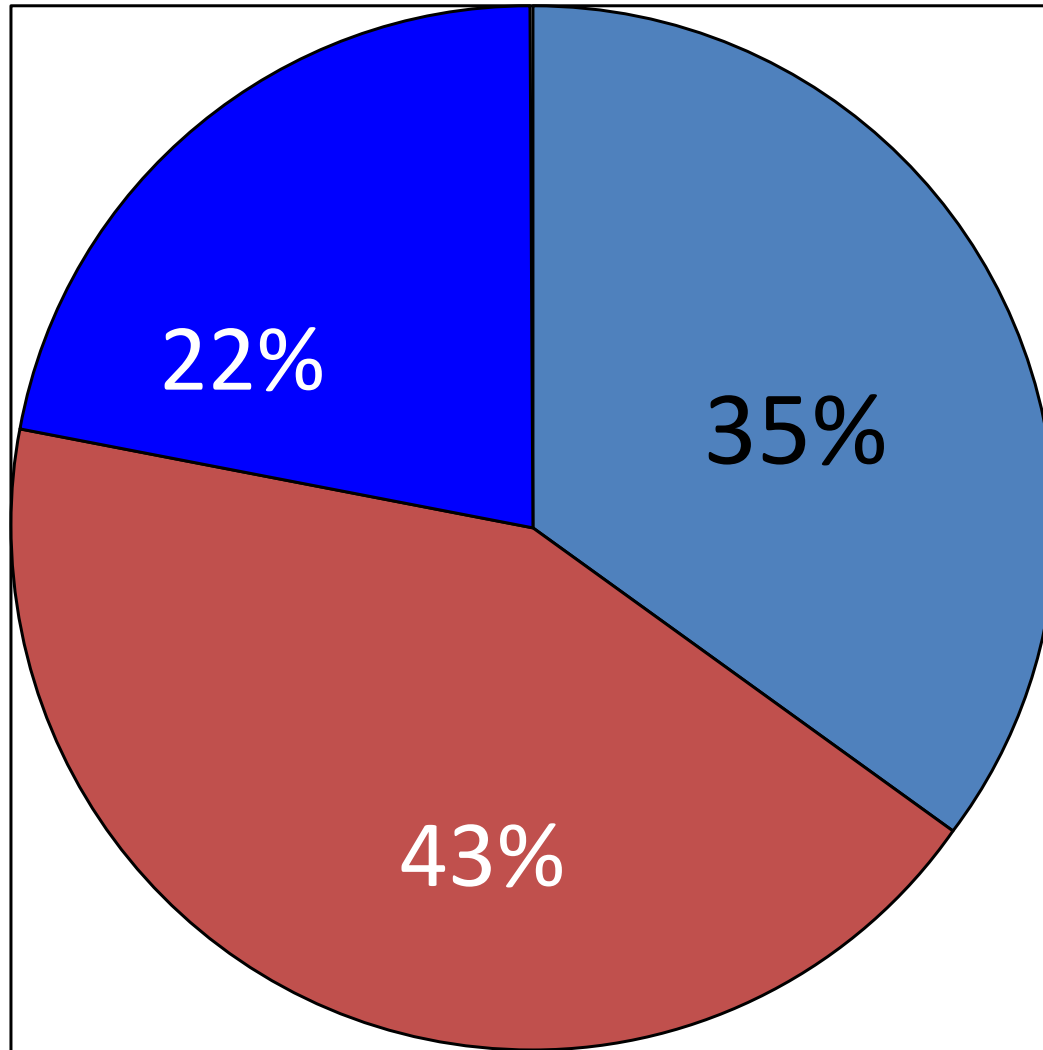


Apr 07

Shop-fabricated AST Systems

Success of Leak Detection

Mar 08



Fires and Explosions



Frozen Vents

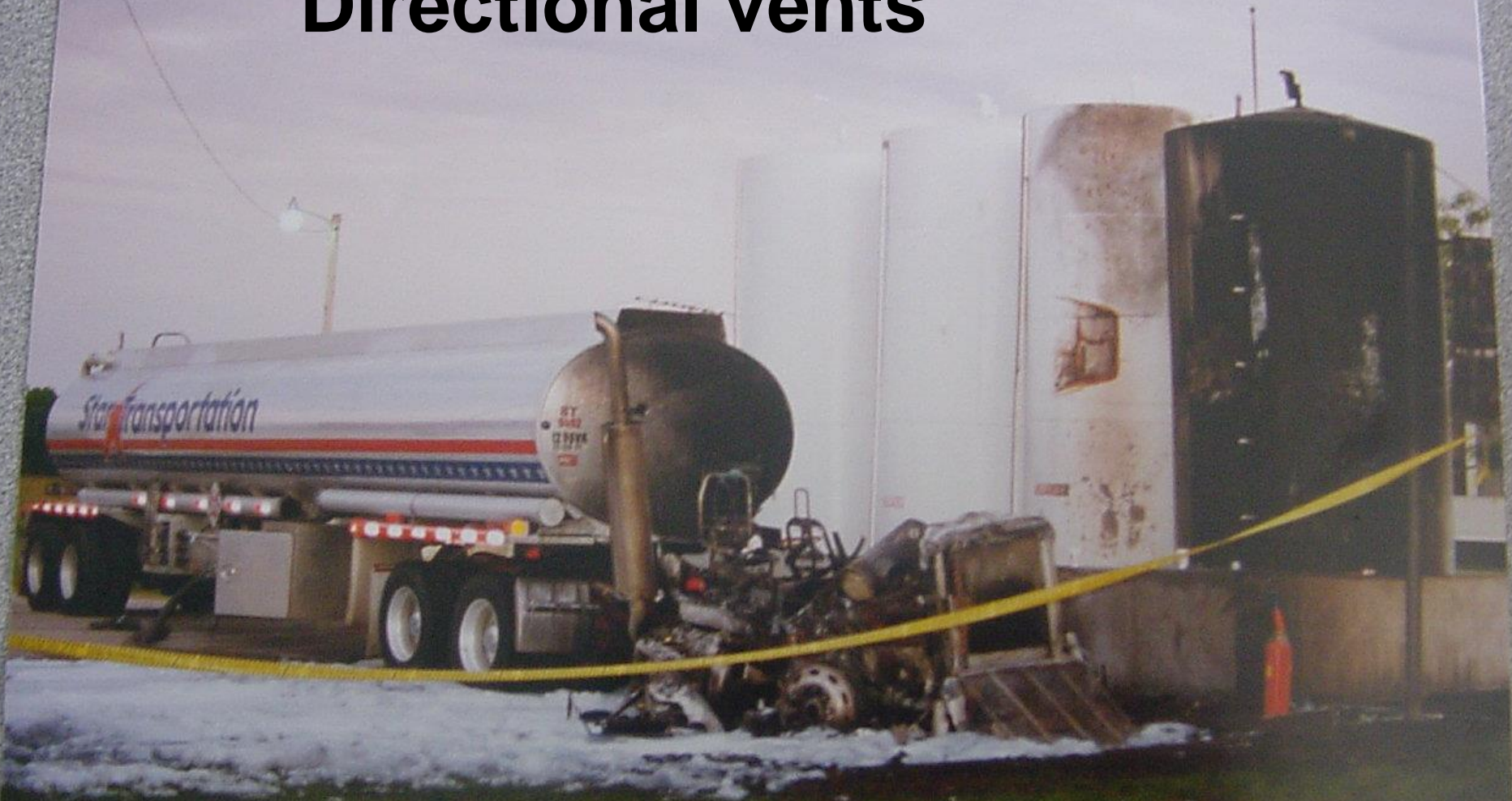


7 9:26 PM



10 1:09 PM

Directional vents



31 1:30 PM

Gallery of Unusual Shop-Fabricated Tank Photos...



Is this an aboveground tank?



Elevated Galvanized Secondary Containment



Non-Elevated Galvanized Secondary Containment



Wooden Secondary Containment





A Barrier or Lay-Away
Secondary Containment?

Using USTs as ASTs





Using USTs
as ASTs

Using USTs as ASTs





Using USTs as ASTs

Using USTs as ASTs



Convertizontals



Ozark tank farm featuring the UL 142/58 convertizontal side draft. Very rare



Tank Farm House



Pig Farm House





~~SHOCKING~~
SERVICE
TANK
LOUISVILLE KY

ONE
TANK

PLEASE DONT SHIT
AROUND THIS WORK AREA



Gotta Get Under the 550 Gallon Regulatory Threshold...



What Happens When You Over-Pressurize a Convault...



What Happens When You Drop a Concrete Silo on a Convault...



Eco-Paint



Thomas Tanks



An Inconvenience Store



2002. 2. 5 13:39

A photograph showing a large, horizontal, cylindrical metal tank, possibly a water storage tank, situated in a grassy area. In the foreground, there is a stream or a small waterway with some debris and a wooden plank. The background is filled with dense green vegetation. The text "Best area for burning trash" is overlaid in yellow on the left side of the image.

Best area for burning trash



DIESEL

1993

10



Mobile Tanks

A Stationary Mobile Tank





Sante Fe Inverted Single-Wall Previously
Mobile Shop-Fabricated Tank on Saddles

UST Piping Sump on an AST



UNLEAD

(Ozarks Again)

They Bought
Another
Vowel
(Ozarks
Again)

NO
SMOKEiNG

Storm Damage



Flooding from Heavy Rainfall





Wind Damage





Storm Surge



Storm Surge Dike-field Damage



Tank Float-off



Boat Didn't Miss



27 10:35 AM

Missed the Boat





My Tank

The End

