Technical Course in Single-Walled Systems

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California Water Boards

Why Are We Here?

- 2014 bill altered H&SC: single-walled and hybrid tank systems will be illegal January 1, 2026.
- SW systems are often found leaking hazardous substances into soil and groundwater.
- Funding availability and timeline.
- Duty of the Water Board: Protect beneficial use of the soils and waters of the State.

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HSC 25292.05

After December 31, 2025, USTs must be permanently closed if:

- Constructed before January 1, 1984 and do not meet the requirements of H&SC §25291(a)(1)-(6), or
- Designed pursuant to §25291(a)(7).

https://en.wikipedia.org/wiki/File:Great_Seal_of_California.svg

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Topics

- Definitions
- Tank Monitoring
- Pipe Monitoring
- Integrity Testing
- Programming Requirements
- Repairs
- Lined/Clad Tanks
- Future Tanks

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Definitions:

https://www.thoughtco.com/writing-topics-extended-definition-1690536

- **ATG:** Automatic tank gauge/static gauging
- **CITLD:** Continuous in tank leak detection
- **ELD**: Enhanced leak detection, integrity test for 0.005gph leaks
- **GW:** Groundwater
- **H&SC:** Division 20, Chapter 6.7 of the California Health and Safety Code
- **Hybrid USTs:** Systems designed in accordance with HSC §25291(a)(7)
- **Integrity testing:** Tightness test for <0.1gph leaks
- **LLD:** Line leak detector

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Definitions:

https://www.thoughtco.com/writing-topics-extended-definition-1690536

- **Single-walled UST:** Single-walled tank connected to single-walled *or* double-walled piping, or a hybrid tank.
- **SIR:** Statistical Inventory Reconciliation
- **SWRCB:** State Water Resources Control Board
- **UPA:** Unified Program Agency
- **UST:** Underground storage tank system; tanks and connected piping
- **UST Regulations:** California Code of Regulations, Title 23, Division 3, Chapter 16
- **VPH:** Vacuum, pressure, or hydrostatic monitoring

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H&SC §25291(a)(1-3)

https://www.epa.gov/sites/default/files/2014-03/documents/sumps-manual-042805.pdf

Post-January 1, 1984 UST requirements:

- Primary containment must be product tight and compatible with the substance stored.
- Secondary containment must be constructed to prevent structural weakening as a result of contact with released hazardous substances.
- Secondary containment must contain 100% of the primary tank volume.

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H&SC §25291(a)(4-6)

https://www.epa.gov/sites/default/files/2014-03/documents/sumps-manual-042805.pdf

Post-January 1, 1984 UST requirements (continued):

- If multiple primary tanks, the secondary must contain 150% of the volume of the largest tank, or 10% of aggregate primary volume.
- Secondary must accommodate max volume of a 24-hr, 25-year storm if open to rainfall.
- Single-walled containers do not fulfill primary and secondary containment. However, a primary with a double complete shell must have a shell constructed of non-earthen materials, detect hazardous substances from the inner container, and detect water intrusion from the outer shell.

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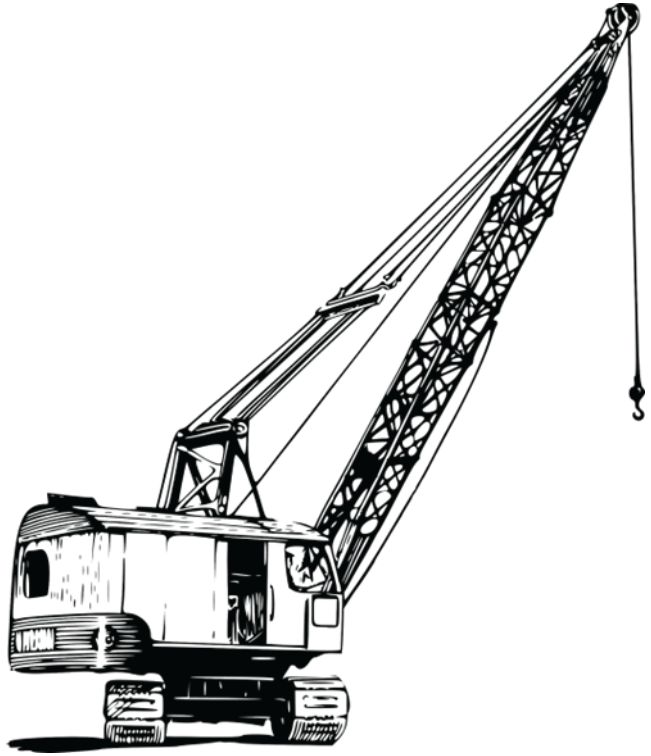
H&SC §25291(a)(1-6)

If the system was installed before January 1, 1984 and doesn't meet these requirements:

<u>Permanent closure before January 1, 2026.</u>



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H&SC §25291(a)(7)

https://www.epa.gov/sites/default/files/2014-03/documents/sumps-manual-042805.pdf

Pre-January 1, 1997 alternative design requirements for USTs storing motor vehicle fuel:

- Primary container made of fiberglass, steel clad in fiberglass, or cathodically protected steel.
- Equipped with system that intercepts and direct leaks from the tank to a monitoring well.
- Provide early leak detection and response; protect groundwater from releases.
- Daily gauging and inventory reconciliation.
- Pressurized piping must meet the above conditions, unless installed on or after July 1, 1987; then must be secondarily contained.

All other hazardous substance USTs were required to be secondarily contained and interstitially monitored by December 22, 1998 (CCR 2662).

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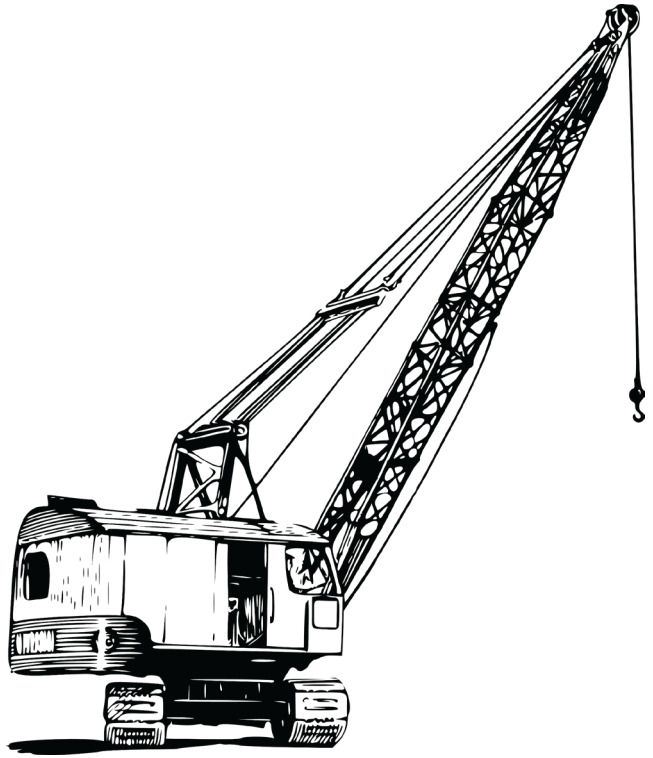
Abandoned Single-walled Tanks

- Out of service;
- Operating permit is not implemented;
- Tank has not been closed, removed, or decommissioned before January 1, 1984.
- Found tanks.
- These tanks are illegal *now*, must be permanently closed.



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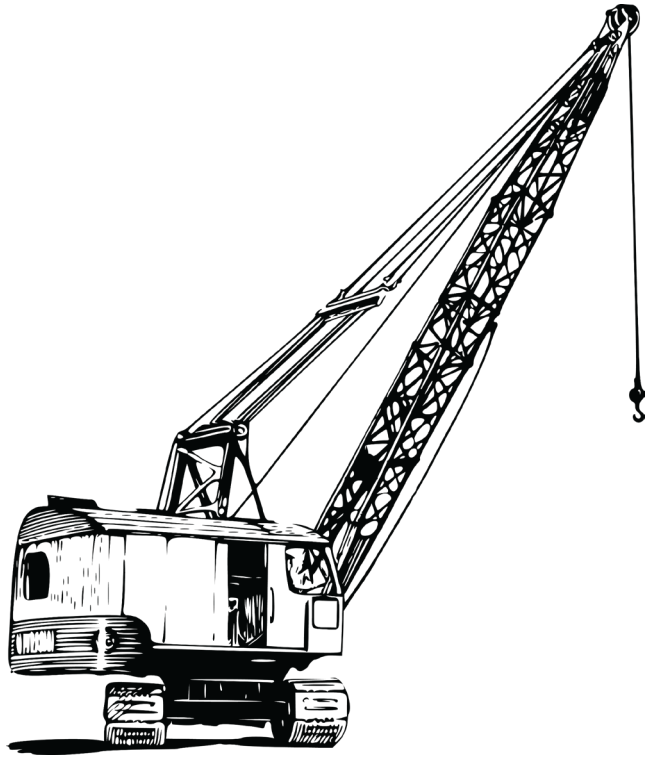
Abandoned Single-walled Tanks

- O/Os leave their tanks without closing in accordance with UST Regulations.
- As 2025 approaches, more abandoned tanks are expected as DW tanks and contractors are spread thin.
- UPAs need to reach out to the State Water Board regarding their abandoned tanks.



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Single-walled USTs:

Single-walled USTs are systems comprised of:

(a) SW tank connected to SW piping,

(b) SW tank connected to DW piping, or

(c) DW tank connected to SW piping* installed <July 1, 1987

*Some SW piping is exempt

https://www.epa.gov/land-research/underground-storage-tanks-research

Importance of Closing Single-walled Systems

https://d12m281ylf13f0.cloudfront.net/images10/tank.jpg

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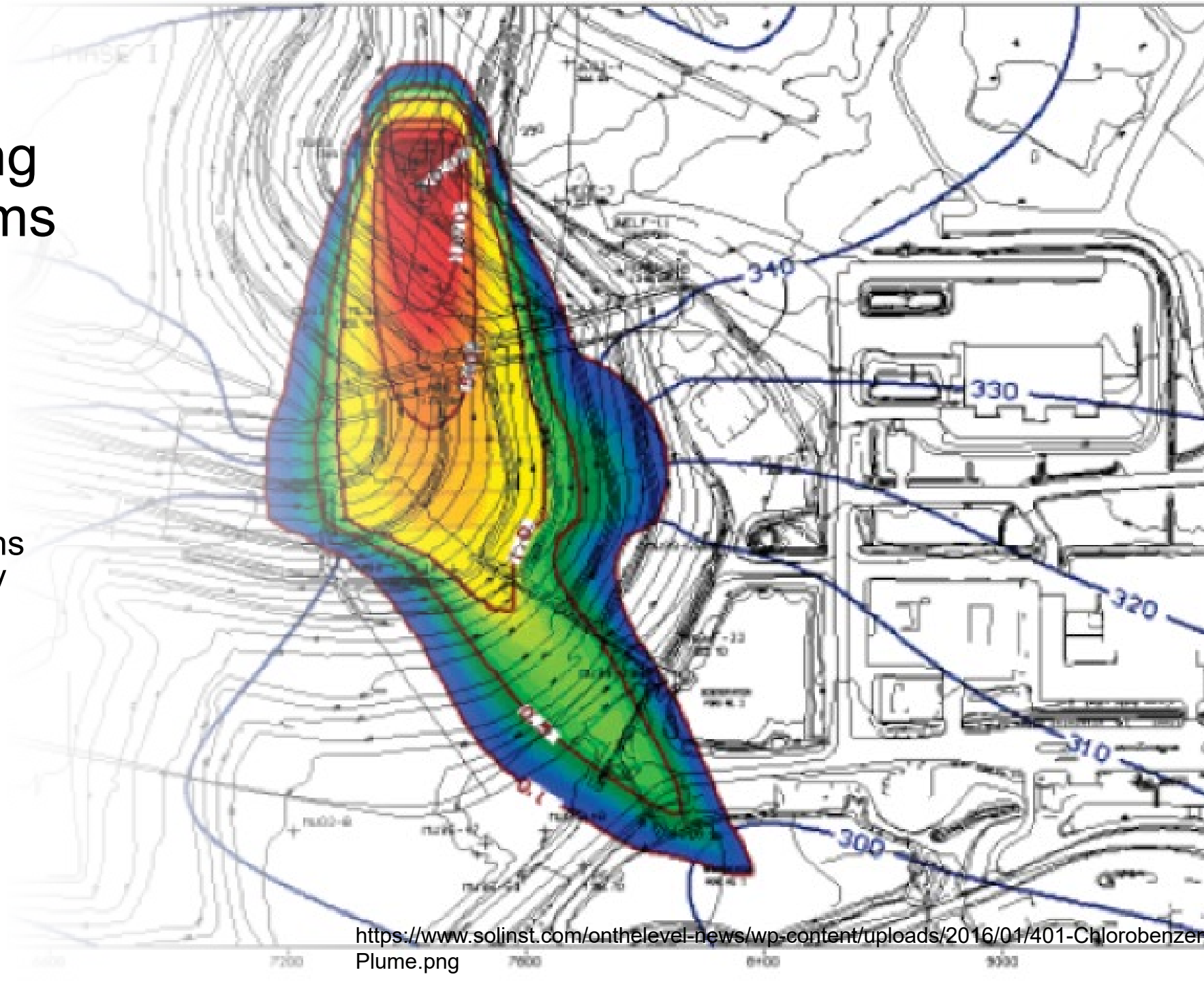
Importance of Closing Single-walled Systems

Monitoring methods for SW tanks allow for over 1,000 gallons of product to leak each year.

Any alarms on SW systems means hazardous substance has already been released to environment.

As costly as they are dangerous.



https://www.solinst.com/onthelevel-news/wp-content/uploads/2016/01/401-Chlorobenzen
Plume.png

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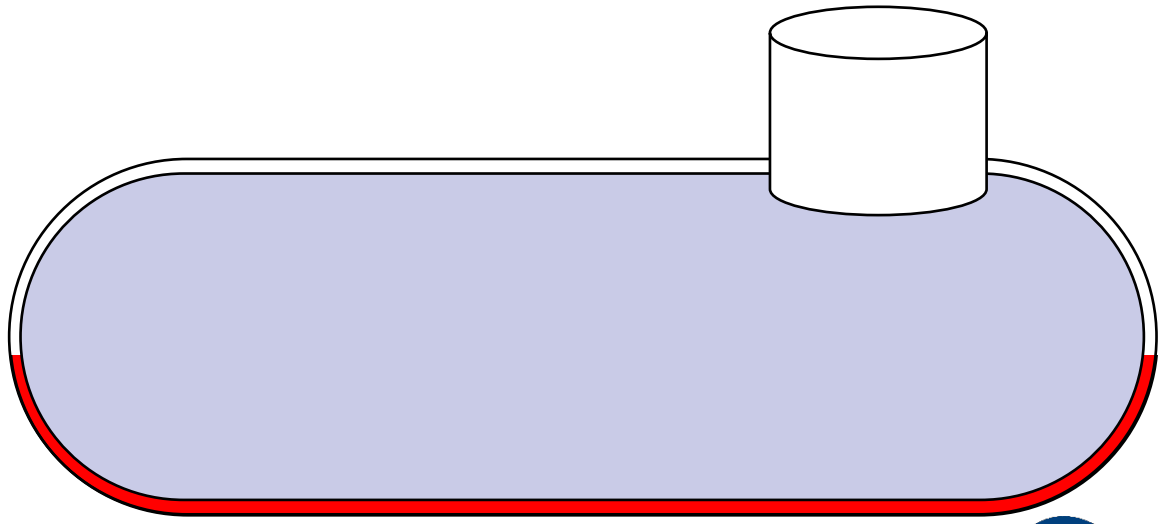
Importance of Closing Single-walled Systems

- Double-walled systems that are closed or upgraded are found to be leaking about 10% of the time (SWRCB Semi-annual Reporting).
- Leak is captured by secondary containment and not released to environment.



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Monitoring Single-walled Tanks

https://www.iqvia.com/locations/nordics/solutions/healthcare-providers/artificial-intelligence-and-machine-learning

- Automatic Tank Gauging/Static Monitoring
- Continuous In-Tank Leak Detection
- Statistical Inventory Reconciliation
- Groundwater Monitoring
- Continuous Vadose Zone Monitoring

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Monitoring Single-walled Tanks

https://www.iqvia.com/locations/nordics/solutions/healthcare-providers/artificial-intelligence-and-machine-learning

95%/5% Requirement: Equipment must properly detect a release 95% of the time; false alarm 5% of the time.

Refer to LG-113 for system volume requirements, configurations, and limitations.

Issue: These methods only alert of catastrophe

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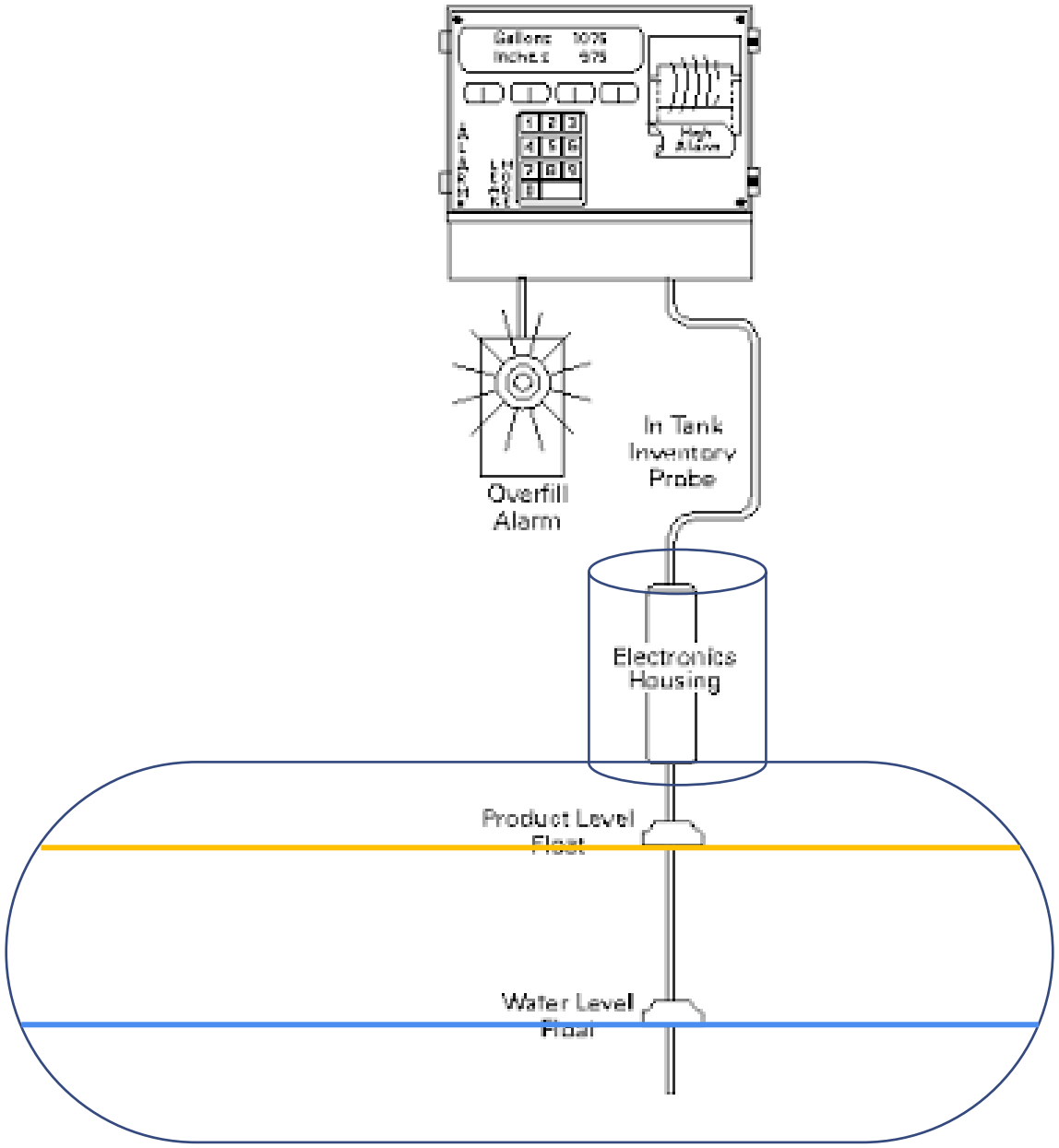

ATG/Static Gauging

- Floats rise and fall as product and water levels in the system change.
- This causes electromagnetic changes along the rod; signal sent to the monitoring panel.
- Requires hours quiet time to collect tank data: sensitive to vibrations.
- High throughput facilities often do not have enough downtime for testing.
- Used often at County facilities.

https://secure.apps.nd.gov/doh/operator/Training/OperatorTraining_ATG.pdf

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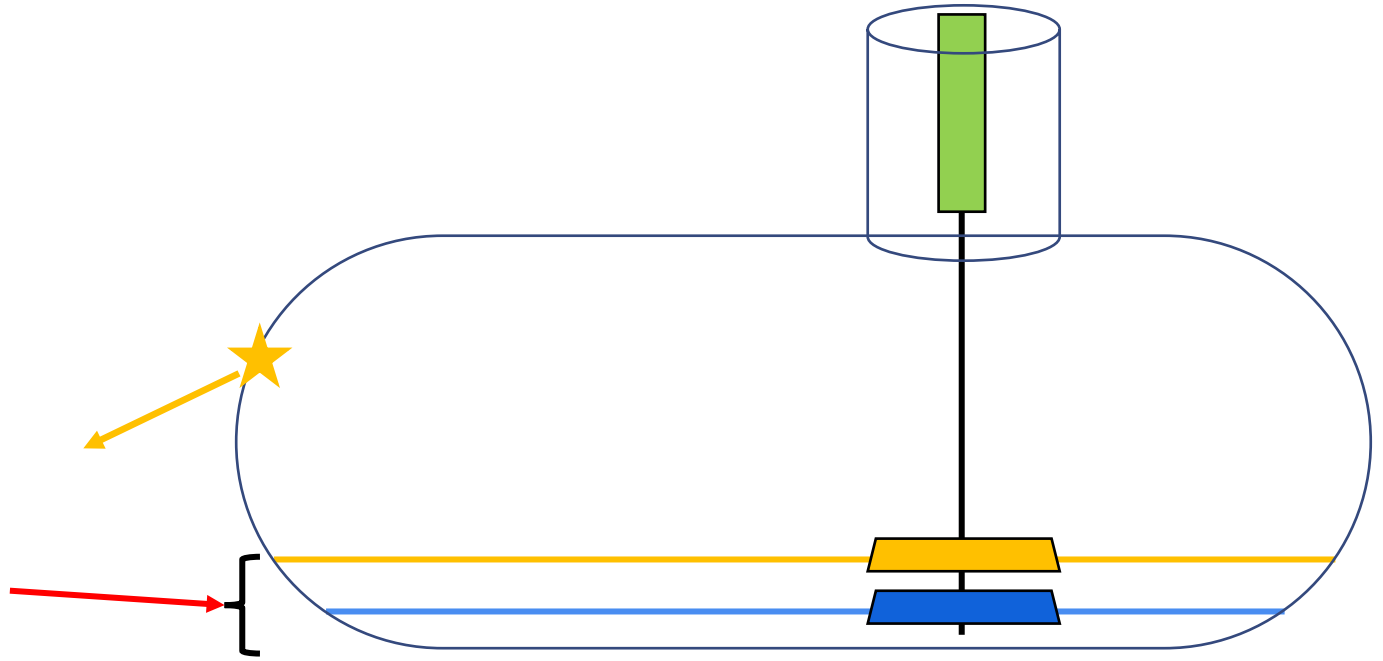
ATG/Static Gauging

- Limits for tank volume/manifolded systems (see LG-113).
- Does not account for theft, delivery, or dispensing.
- 0.2 gph every 30 days (over 100 gallons a month can go undetected).
- UST Regulations, §2643: test after product delivery or when tank is filled to within 10 percent of highest level during the previous 30 days.

Run into problems with low filled tanks (only tests filled portion of tank).



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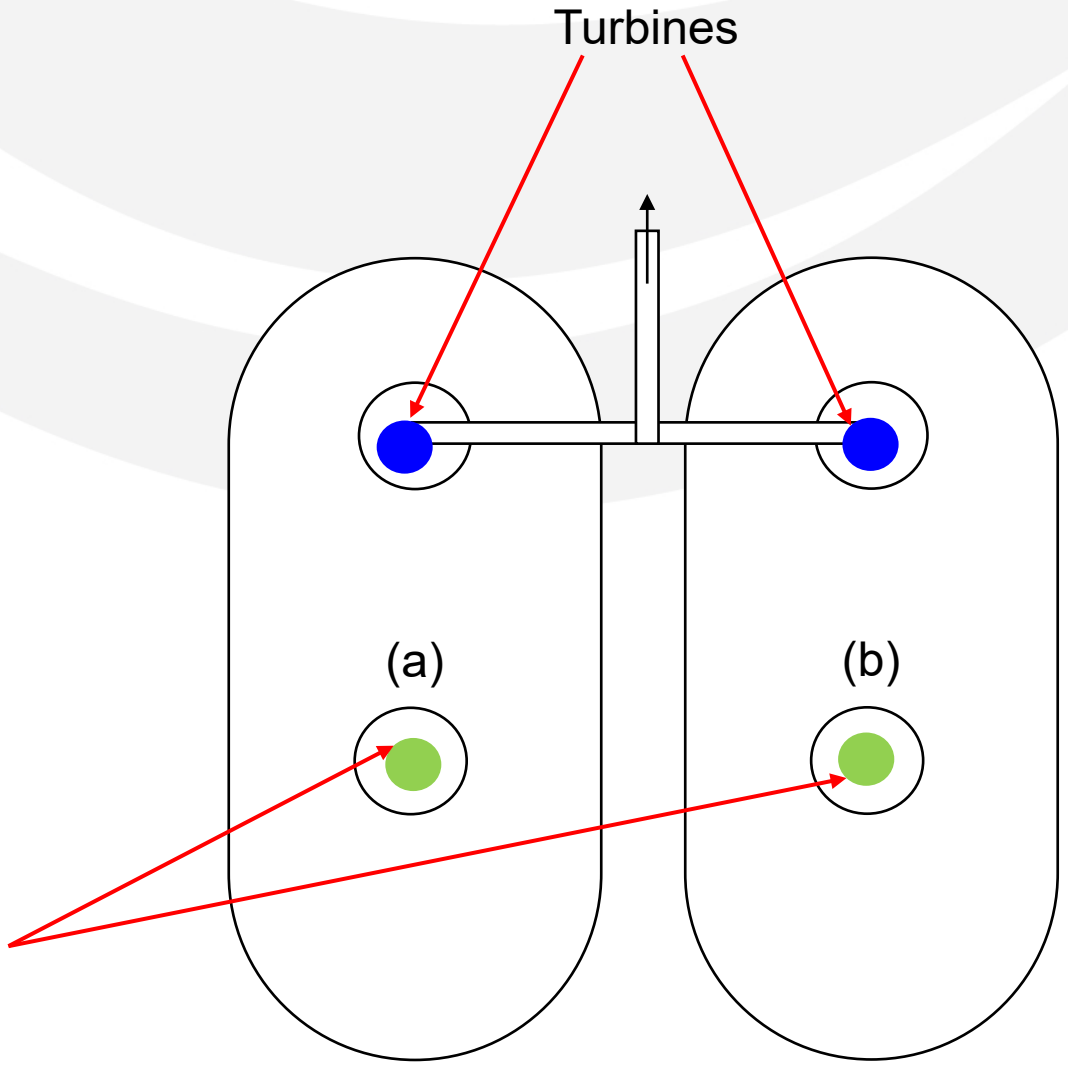
ATG/Static Gauging

Manifolded tanks that each have a turbine are required to each have an ATG probe.

Amount of product pumped from tank (b) does not effect product level in tank (a).



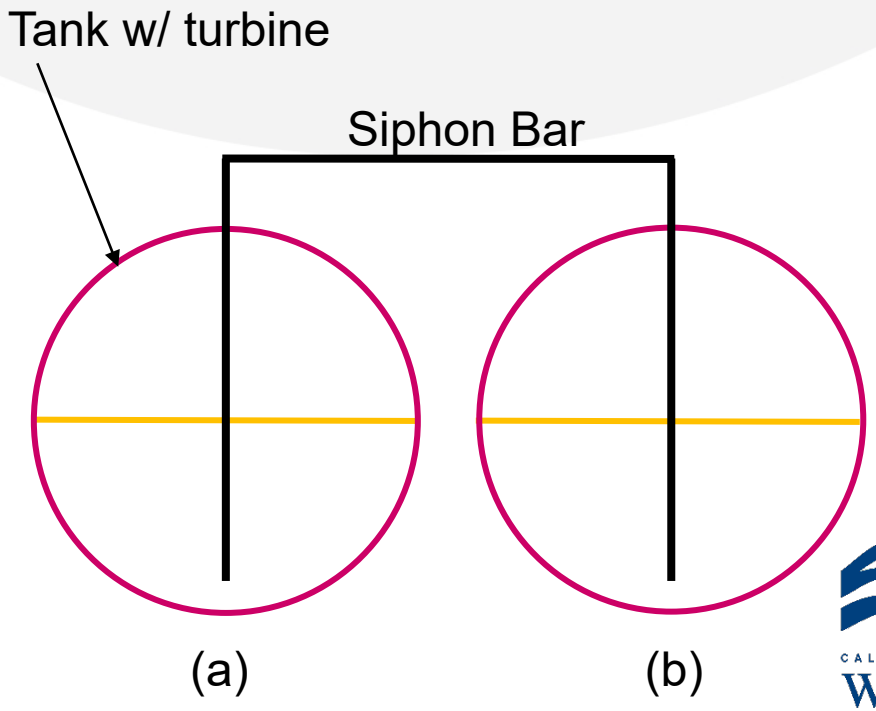
ATG/Static Gauging

Tanks manifolded with a siphon bar can be monitored with one ATG with some tweaks:

If 0.2 gallons leaks in one hour from tank (a), there will be 0.1 gallons less in tank (a), and 0.1 gallons less in tank (b).

Therefore, the ATG probe monitoring two manifolded tanks must be able to detect a 0.1gph release.

Some ATG's aren't certified for manifolded tanks (see LG-113) and therefore can not be used on manifolded systems.



ATG/Static Gauging

- Service technicians certify monitoring equipment on an annual basis.
- Demonstrates that the equipment is in proper operating condition and calibrated (floats do not get stuck).

<u>A favorable monitoring certification DOES NOT mean the tank is tight.</u>

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Continuous In-Tank Leak Detection

https://cliffordfuel.com/wp-content/uploads/2019/07/Homepage-Delivery.jpg

- Implements level probe technology like ATG/Static monitoring and continuous product reconciliation.
- Data collected on an ongoing basis.
- Monitoring system must operate uninterrupted.
- Quiet time requirement is minutes vs hours.
- 0.2 gph every 30 days (over 100 gallons a month can go undetected).

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Statistical Inventory Reconciliation

- ATG reads product/water levels during tank quiet time
- O/O records deliveries and daily sales
- Product type
- Tank manufacturer, material, size
- Third party compares O/O records to tank charts, tilt, and product input and withdrawal through statistical analysis

https://c8.alamy.com/zooms/9/eb928ed192a8463e897e09b415936929/d4j42n.jpg

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Statistical Inventory Reconciliation

https://unctad.org/sites/default/files/2020-07/image/topic_statistics.jpg

- Poorly calibrated dispensers may incorrectly track dispensed product, causing issues.
- Throughput requirements.
- Requires days of data collection in order to test.
- Verify applicability for manifolded tanks.
- 0.2 gph every 30 days and 0.1 gph tank integrity test every 24 months (over 100 gallons a month can go undetected).
- After October 1, 2018, SIR must report a quantitative leak rate using a threshold not to exceed half the minimum detectable leak rate (CCR, 2643(b)(2)).

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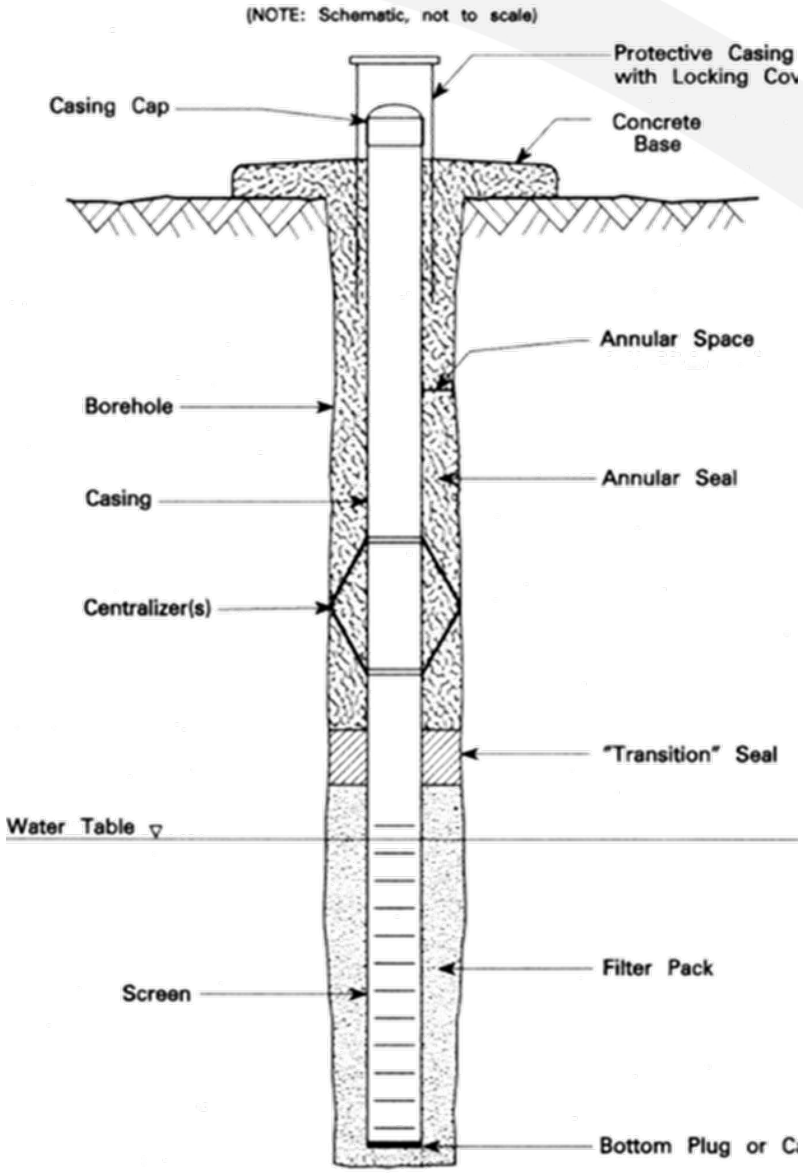

Groundwater Monitoring

- Wells are installed to continuously monitor for releases to groundwater.
- “Out of tank” product detector.
- Only method of release detection if:
  - Hazardous substance is less dense than water and SG<1.000
  - Detects at least 1/8th inch free product on groundwater
  - GW is less than 20 feet from existing grade
  - K for soil is 0.01cm/s (gravel, coarse sands, etc.)
  - Groundwater has no beneficial use, including connecting waters
  - Located as close to excavation as feasible

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https://www.researchgate.net/profile/Jerome-De-Graff/publication/259440230/figure/fig6/

Groundwater Monitoring

- Typically used for field constructed tanks; not common.
- 0.125” product every 30 days
- Sensors styles: float, electrical conductivity, optical
- UST Regulations, 2648(c) specifies number of wells/locations for different system sizes:
  - (a) 1 tank: 2 wells (one at each end)
  - (b) 2-3 tanks: 3 wells (equally spaced)
  - (c) 4 or more tanks: 4 wells (2 must be downgradient)
  - (d) Piping: as determined by UPA.

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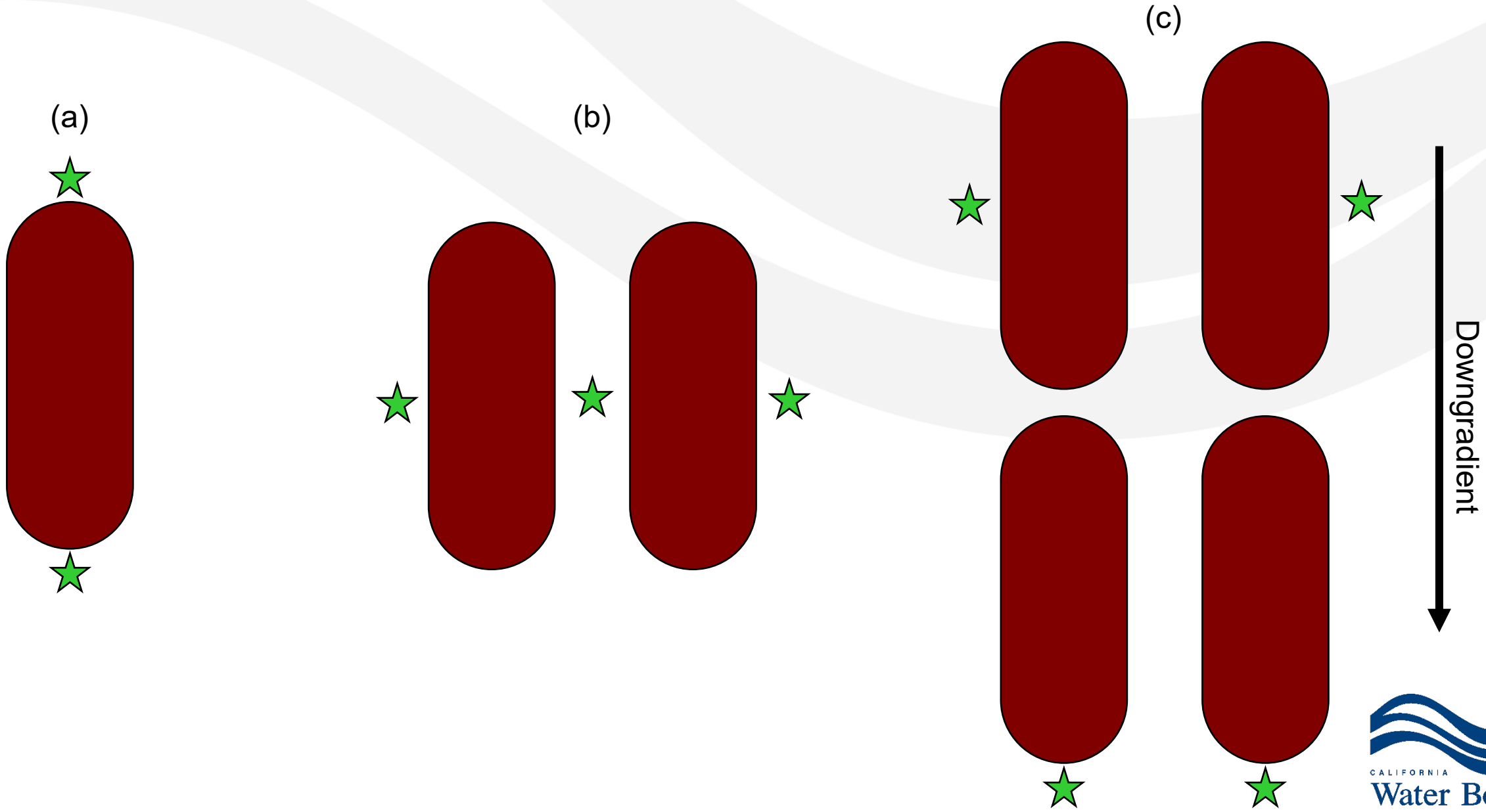
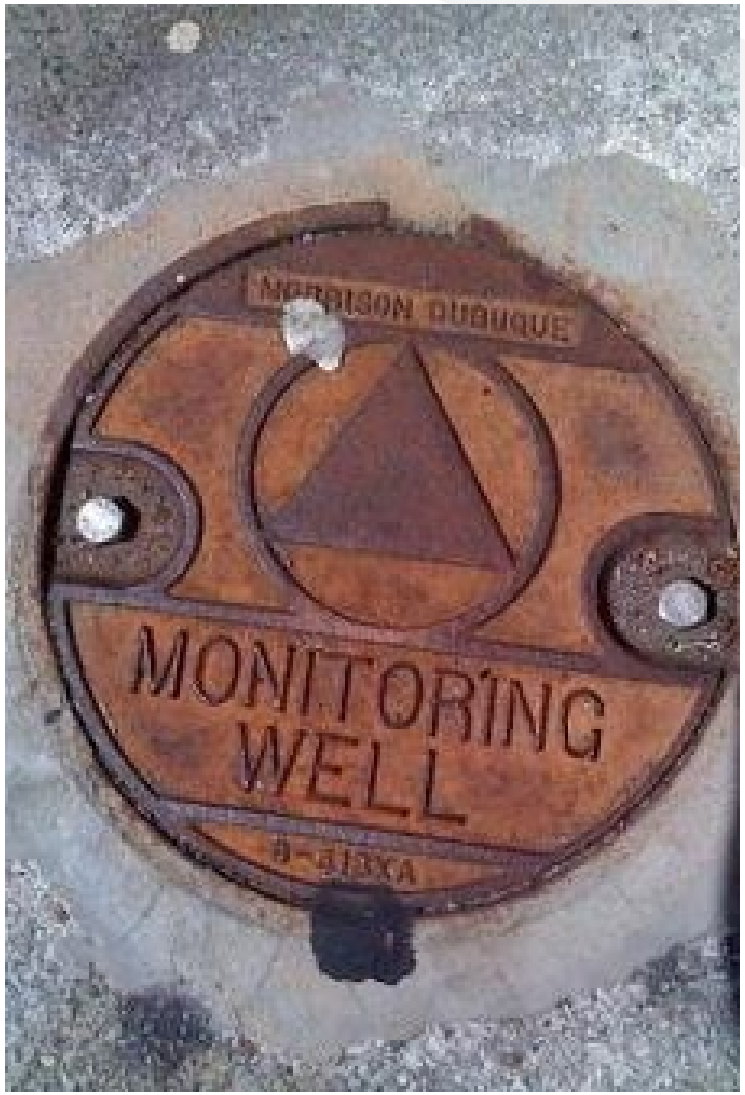
https://www.thoughtco.com/why-oil-and-water-dont-mix-609193


(a)
(b)
(c)
Downgradient



Continuous Vadose Zone Monitoring

- Continuous monitoring for product in soil vapor
- Weekly monitoring for product in soil-pore liquid
- “Out of tank” product detector
- Required for hybrid tank systems
- Only method of release detection if:
  - Well is placed in backfill
  - GW is less than 10 feet below bottom of tank

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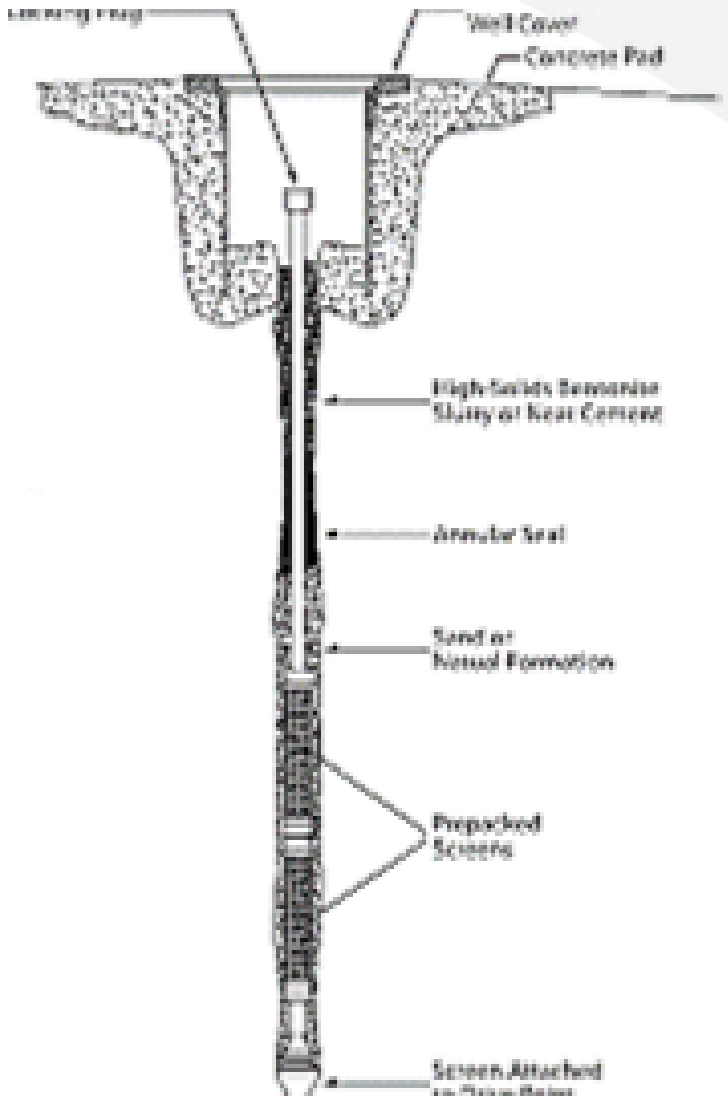

Continuous Vadose Zone Monitoring

- Requires well drained backfill/soils
- Product/tracer must vaporize easily
- Sensing: fiber optics, metal oxides, gas sensors

- UPA approves locations after exact tank and piping locations determined (section 2647).
  - Location/depth where vapor is expected to occur
  - Any ponding locations

https://www.etec.energy.gov/Library/Cleanup_and_Characterization/Soil/Co-Located/Soil_Vapor_Probe_Installation_Procedures_Plan_Final.pdf

Piping

- Pressurized: product conveyed under pressure greater than atmospheric
- Conventional suction: product conveyed under less than atmospheric pressure
- Gravity: product conveyed via gravity
- Safe/European suction: conventional suction with more steps

http://www.bayareatankcoatings.com/storagetank-portfolio/2015/3/15/coming-soon

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CCR §2643(c)

Single-walled Pressurized Pipe

- Monitoring conducted <u>hourly</u> – 3 gph at 10psi; and either:
  - 0.2 gph tightness test every 30 days at operating pressure; or
  - 0.1 gph tightness test every 12 months at 150% operating pressure.

https://oilgaspages.com/client/Media/48108/full/Service%20Facility%2045%20Piping.jpeg

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Line Leak Detectors

- Required on all buried, pressurized pipe.
- Use mathematical models to determine if there is a leak in the line.
- Test is run after turbine stops.
- ***Only option*** for monitoring single-walled pressurized pipe.

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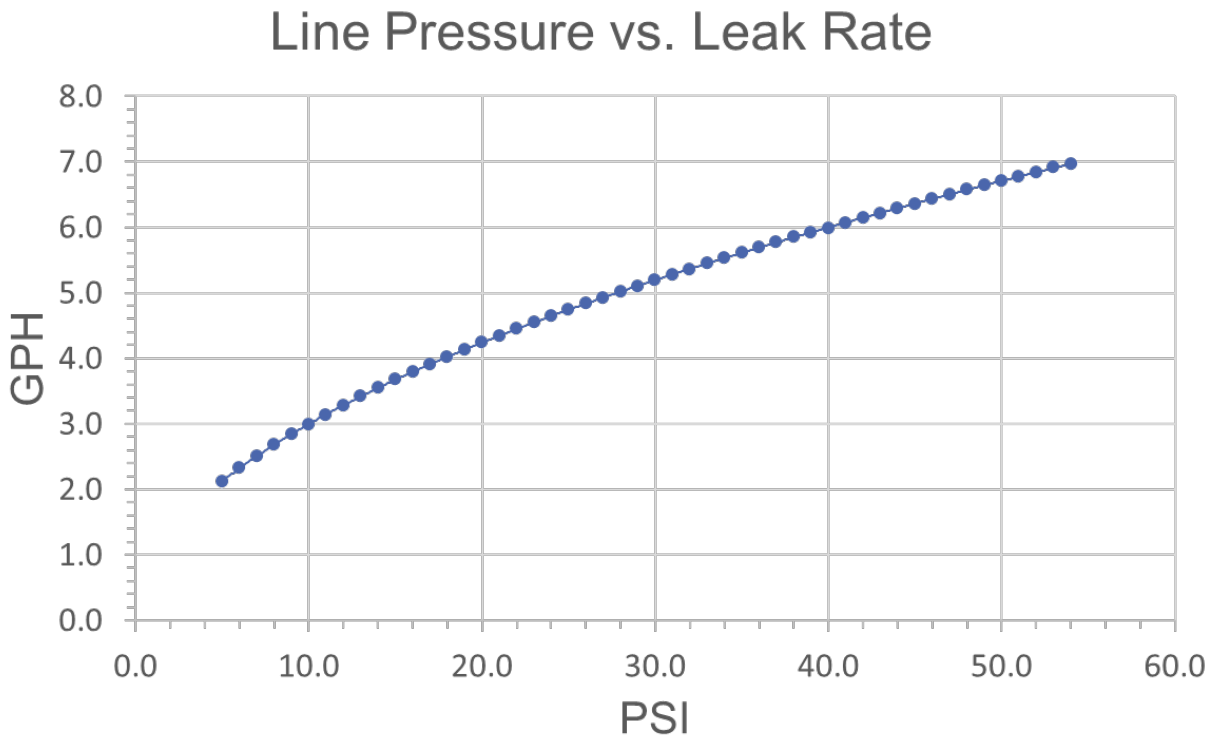
Testing LLDs - Equivalent Leak Rates

Line Pressure (PSI)	Equivalent Leak (GPH)
5.0	2.1
10.0	3.0
15.0	3.7
20.0	4.2
25.0	4.7
30.0	5.2
35.0	5.6
40.0	6.0
45.0	6.4
50.0	6.7



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Line Leak Detectors

- UST Regulations, §2666(c): By 1998, LLDs on SW pipe must be fail safe and positive shut off*
- Therefore, ***only electronic LLDs*** can be used on single-walled pressurized pipe.
- *Emergency generator systems can use audible/visual alarm instead of positive shut-off.
- Emergency generators with single-walled pressurized piping still need to be closed by 2026.

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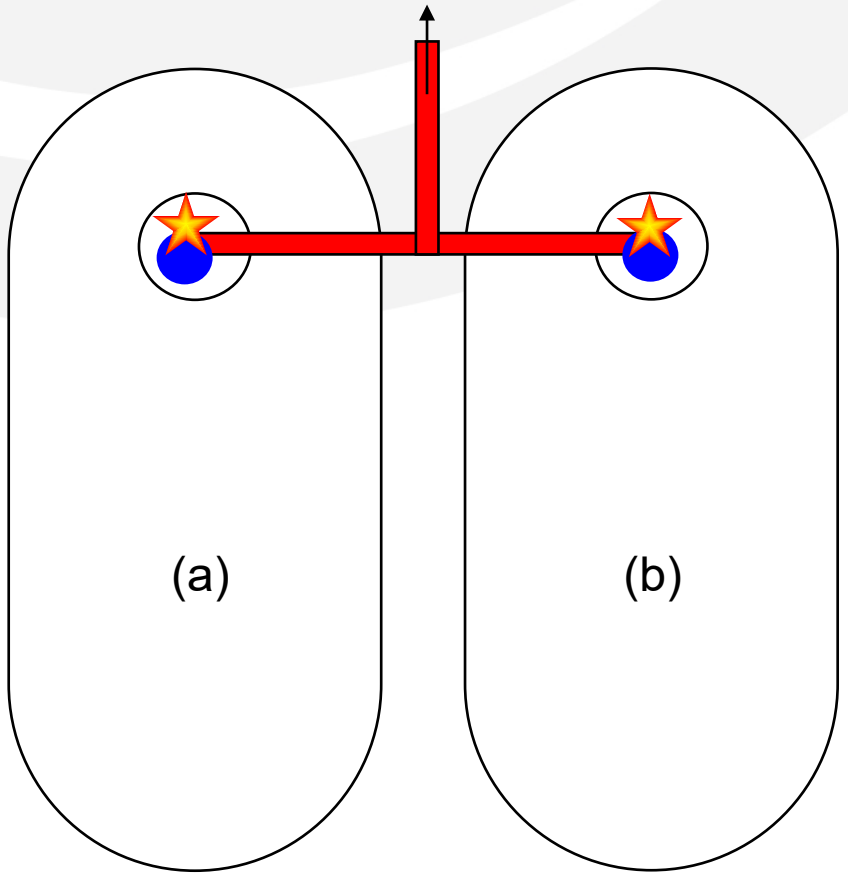
LLDs and Manifolds

- LLDs installed at each turbine are looking for a 3 gph leak each.
- Therefore, the entire system is searching for a leak equivalent to 6 gph at 10 psi, and does not meet the 3 gph requirement.



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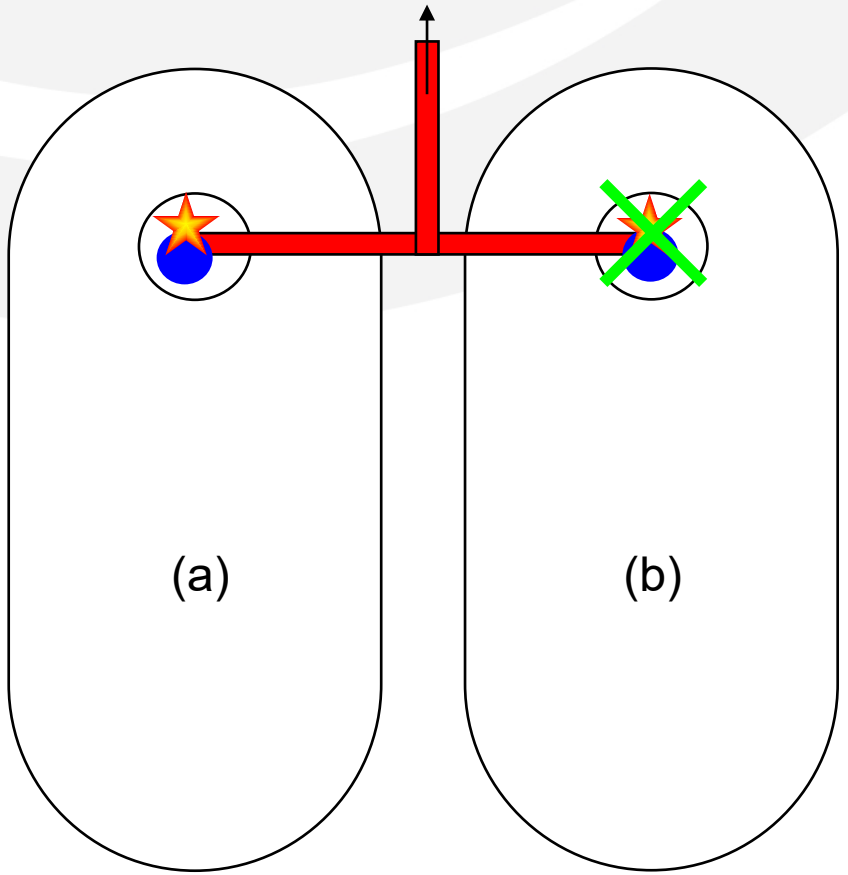
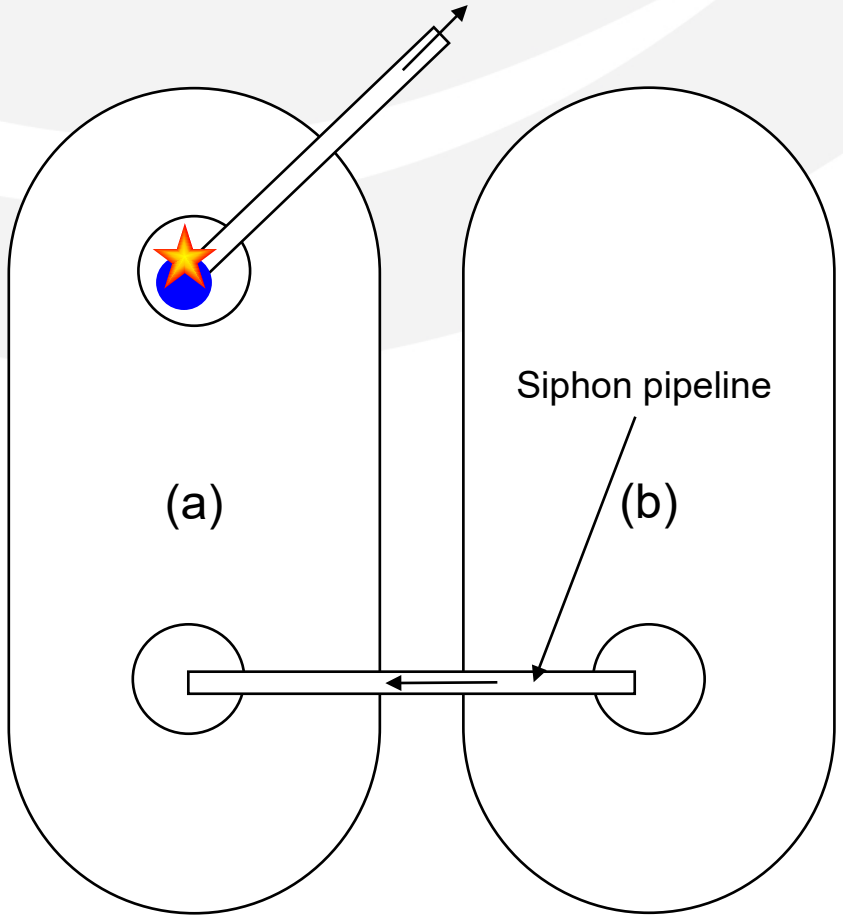


LLDs and Manifolds

In a design with one tank turbine, the LLD can be installed in its standard position.

No LLD required for the siphon line: not pressurized piping.



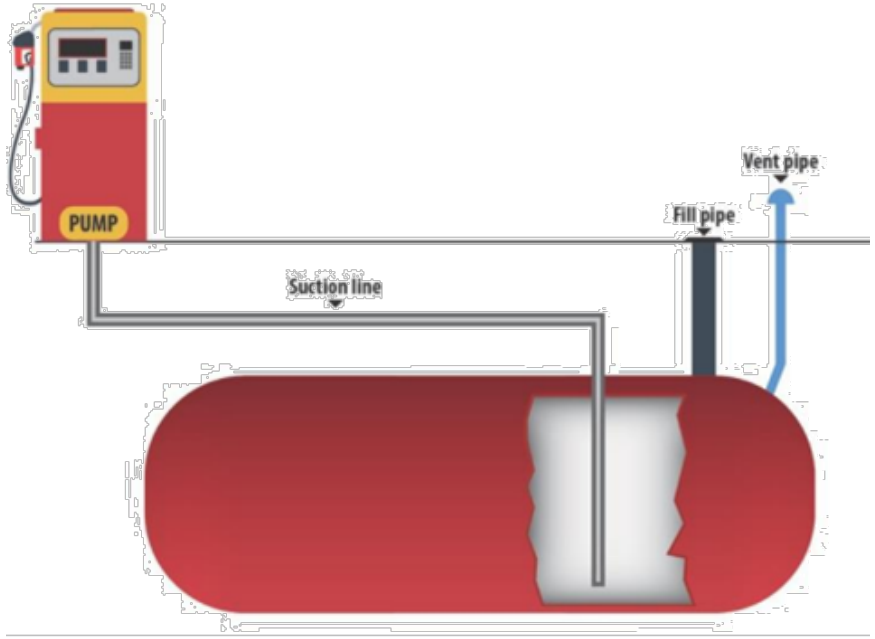
https://cdn.britannica.com/44/133044-050-9554CBE4/siphon-container-weight-pressure-atmosphere-balance-liquid.jpg

CCR §2643(d)

Conventional Suction Pipe

- Daily visual monitoring* with log for presence of air, and;
- 0.1gph, 40 psi, every 36 months.

*Emergency generators with conventional suction may be monitored less than daily, but at least every 30 days, or whenever the system operates.



https://www.sbeap.org/files/sbeap/storage-tanks/USTManual_09.10.21.pdf

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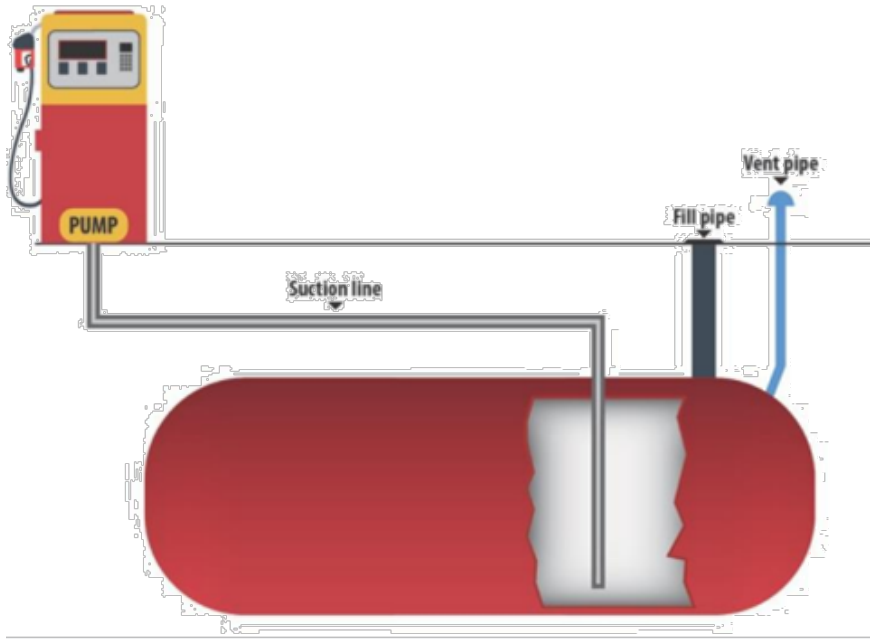
CCR §2643(d)

Conventional Suction Pipe

- If piping can't be isolated from tank, tested using an overfilled volumetric tank integrity test.
- Overfilled tank tests are very expensive and intrusive. Last effort.
- On/after July 1, 1987: must be DW.



https://www.sbeap.org/files/sbeap/storage-tanks/USTManual_09.10.21.pdf

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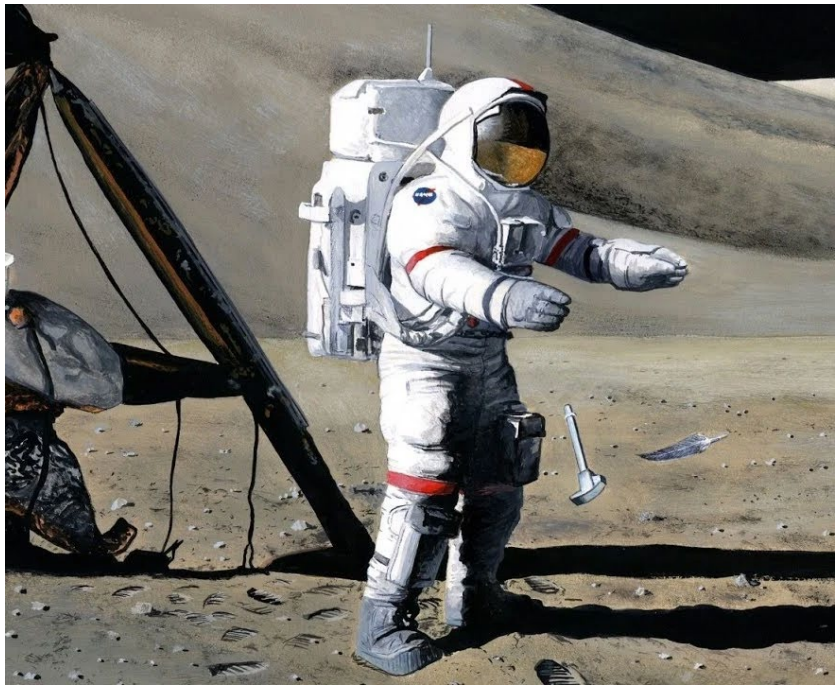
CCR §2643(e)

Gravity Pipe

- 0.1 gph, 40psi, every 24 months, or;
- If piping can't be isolated from tank, tested using an overfilled volumetric tank integrity test.



https://laughingsquid.com/wp-content/uploads/2019/05/David-Scott-Feather-Hammer-Galileo.jpg

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CCR §2636(d)

Safe Suction Piping/European Suction

No monitoring requirements if:

1. Below-grade piping operates at less than atmospheric pressure;
2. Below-grade piping is sloped so the contents drain back into tank if suction is released;
3. No valves or pumps installed below grade in suction line. One check valve installed directly below and as close as practical to the suction pump is permissible, and;
4. Inspection method* readily demonstrates these requirements are met.

- This inspection method must be readily demonstrated during annual monitoring certification.
- Safe suction on DW tanks installed before July 1, 2003 does not require permanent closure (2636(a)(3)).

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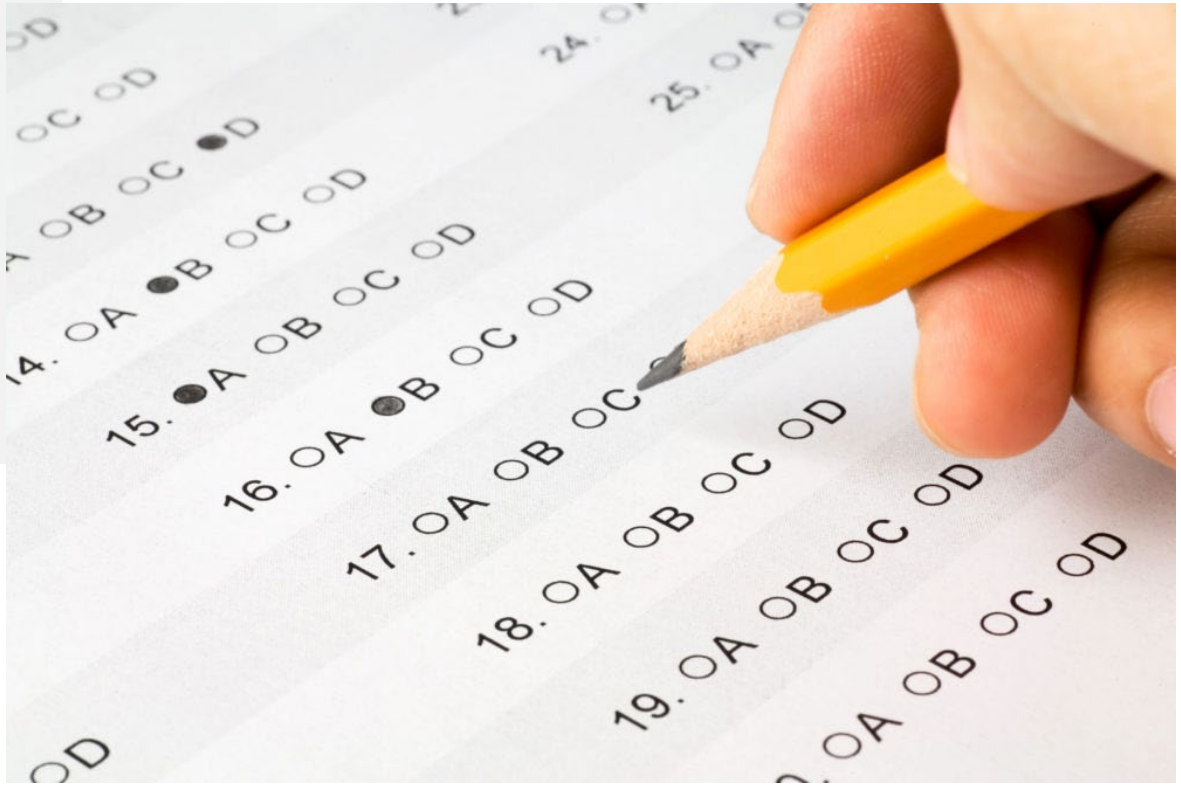
Integrity Testing

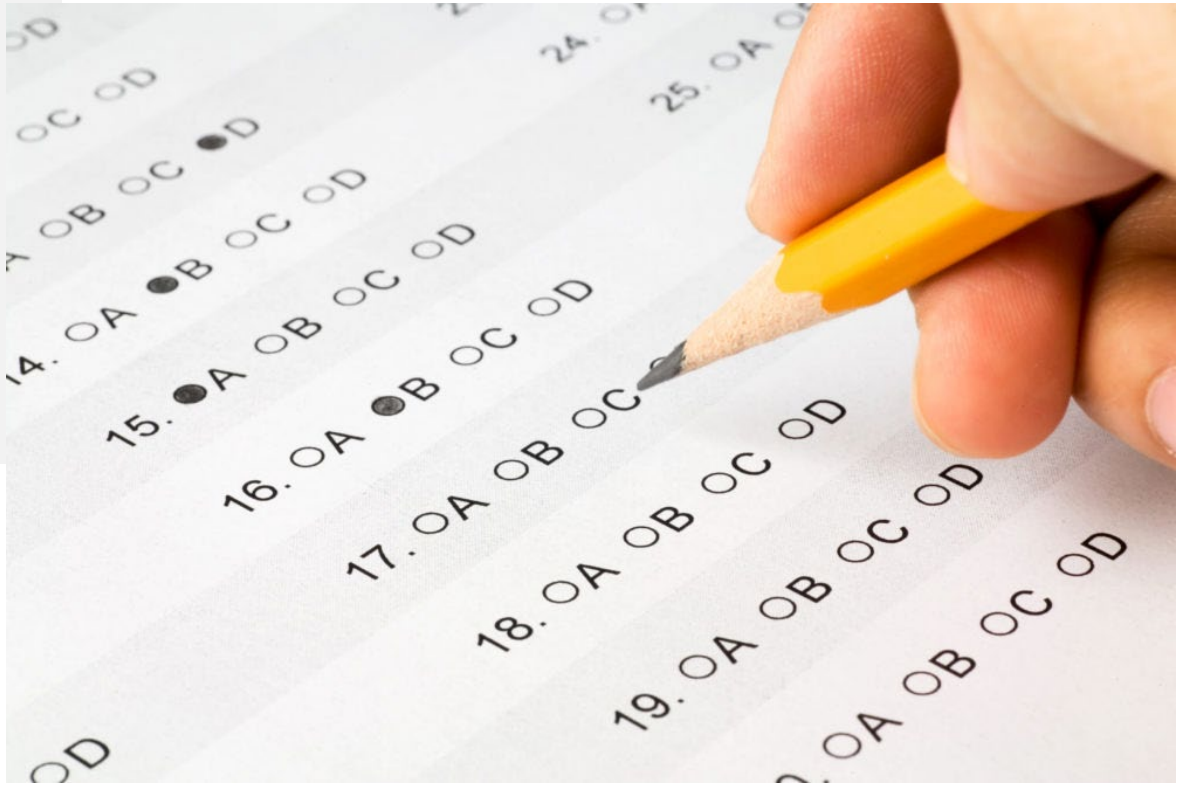


Required for:

- SW tanks implementing SIR (24 months)
- SW pressurized piping (monthly/12 months)
- SW conventional suction piping (36 months)
- SW gravity piping (24 months)

https://media.wbur.org/wp/2020/05/pencil-standardized-test-1000x667.jpg

Integrity Testing



Tank/pipeline is pressurized, pressure is monitored over a period, or;

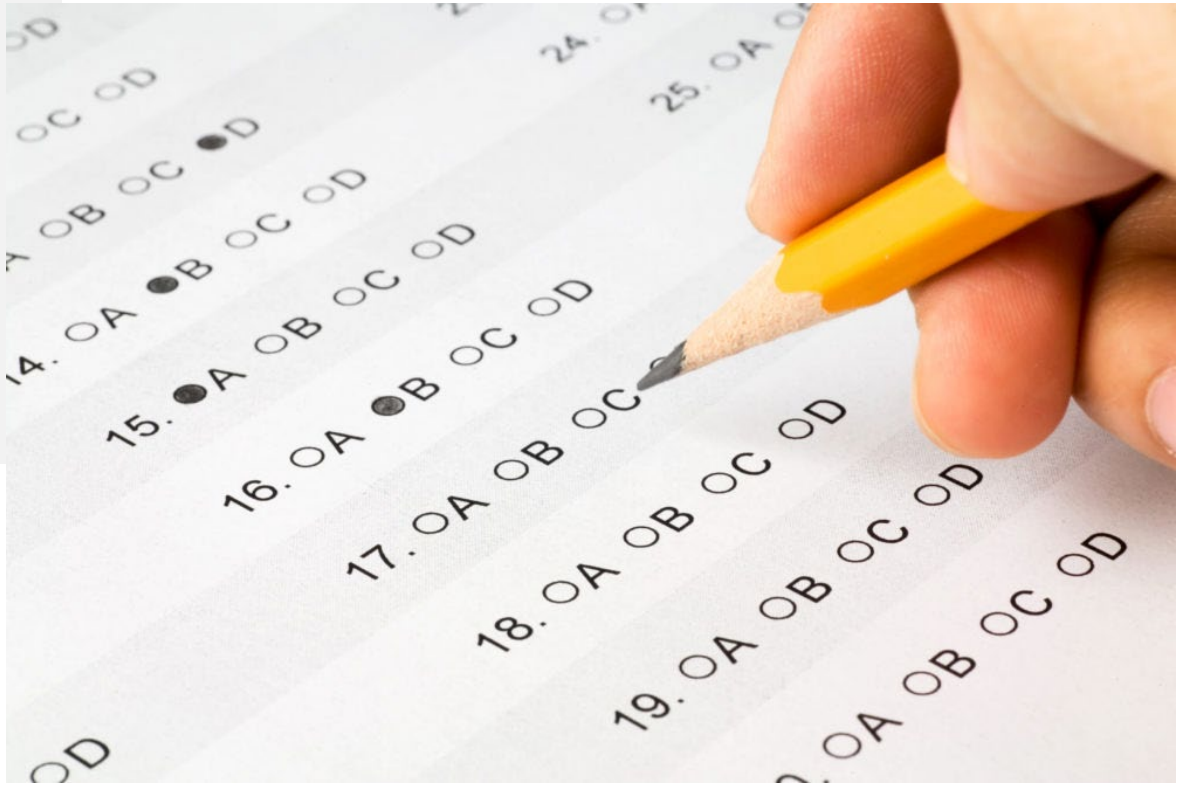
Checks for tracer chemical outside of primary containment.

“Quantitative”: test determines size of leak.

LG-113 lists all acceptable integrity test methods and what systems they can be used on.

https://media.wbur.org/wp/2020/05/pencil-standardized-test-1000x667.jpg

Integrity Testing Limitations



Tank capacity/fill volume

Product type

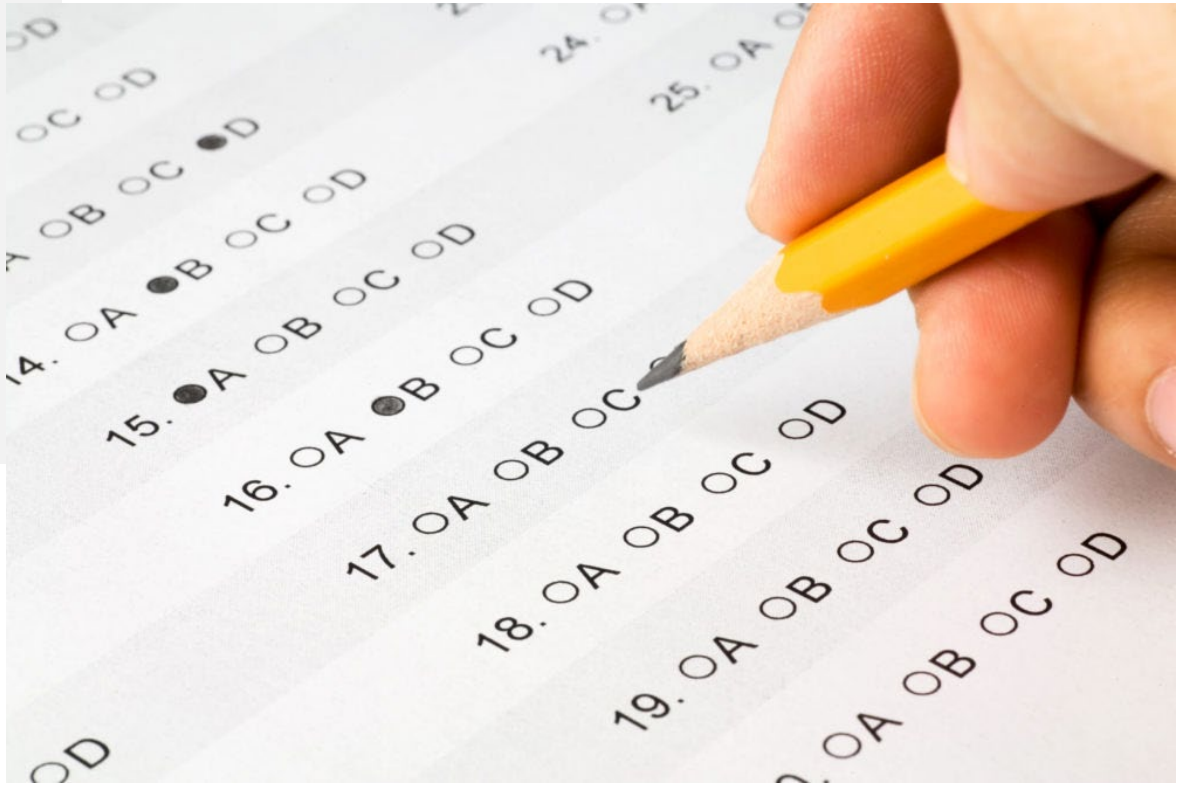
Wait time between delivery/testing (up to 24 hours)

Test time (up to 24 hours)

Groundwater level

https://media.wbur.org/wp/2020/05/pencil-standardized-test-1000x667.jpg

§2643(f)

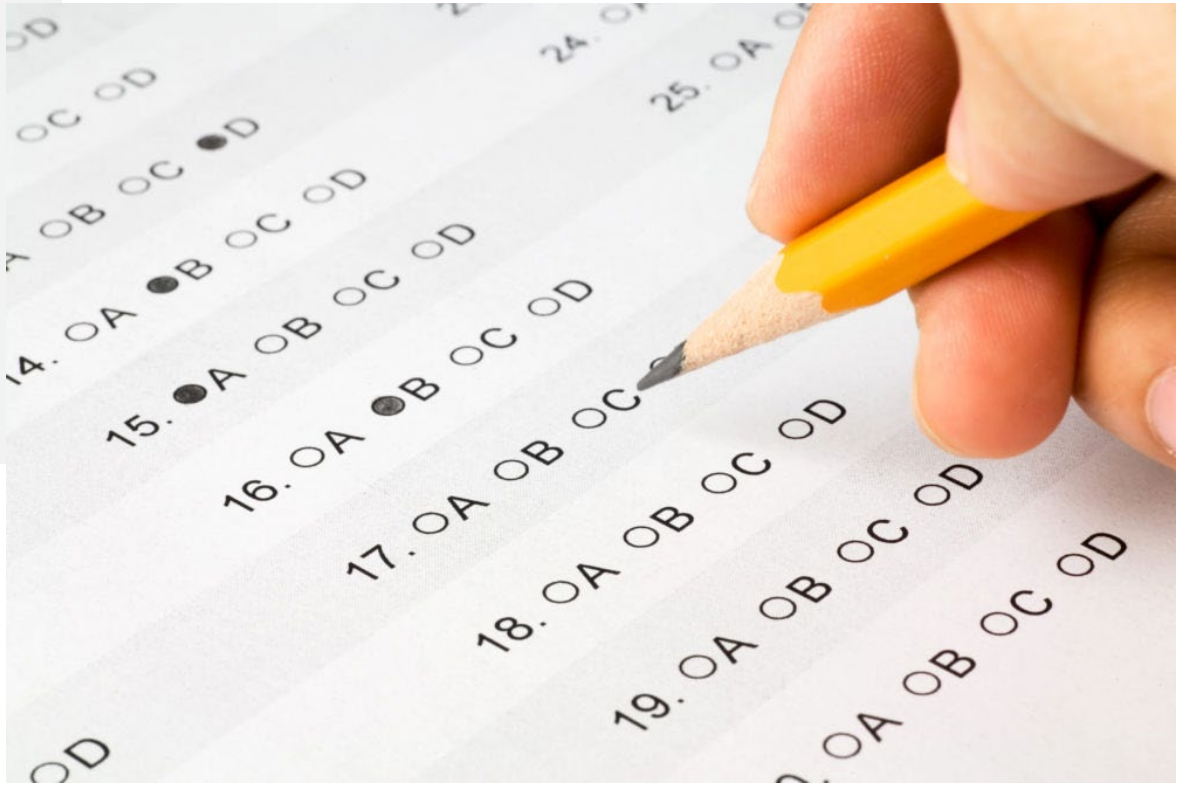


Quantitative release detection methods must be certified by third parties per:

- EPA Standard Test Procedure,
- Voluntary consensus standards, or
- Method equivalent to EPA Standard Test Procedures.

https://media.wbur.org/wp/2020/05/pencil-standardized-test-1000x667.jpg

§2643.1

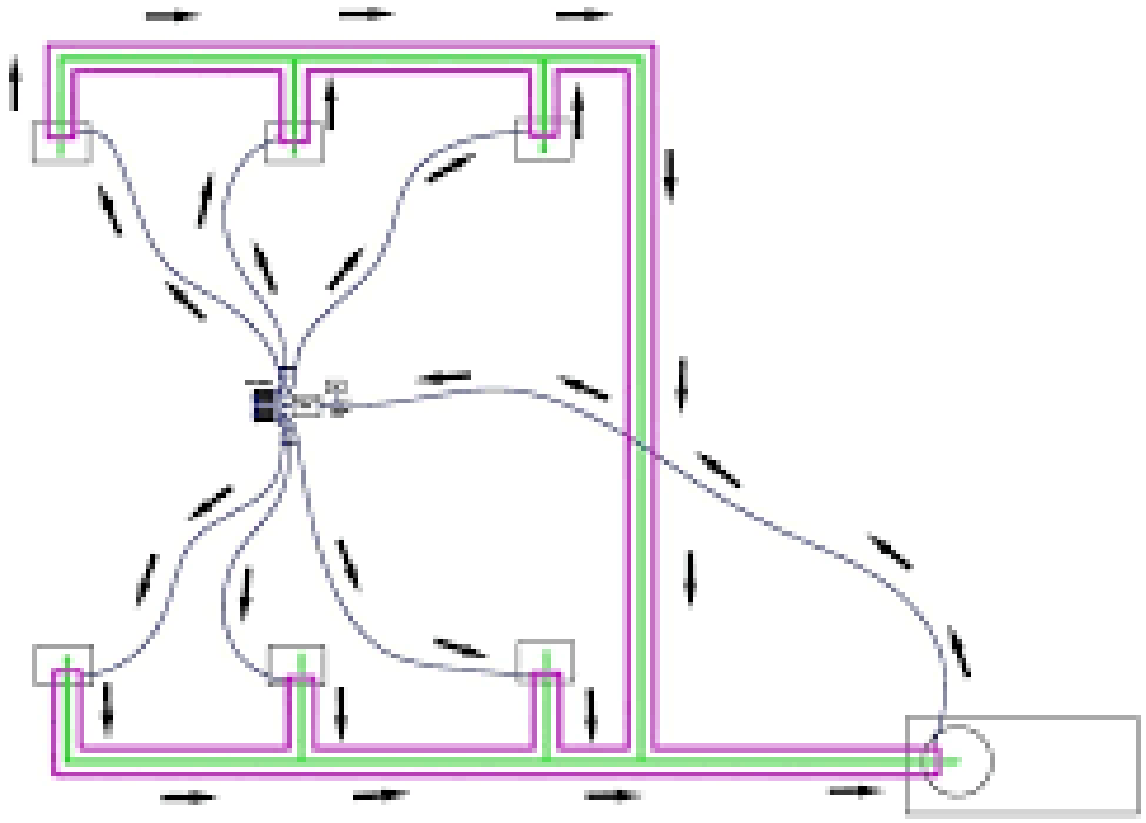


SW tanks: volumetric tank integrity testing

- 0.1gph
- Tank must be >65% full, or
- Tested under pressure equivalent to a full tank.

https://media.wbur.org/wp/2020/05/pencil-standardized-test-1000x667.jpg

Enhanced Leak Detection



- Form of integrity test.
- Tests tank and connected piping.
- Tracer chemical introduced into primary containment.
- ELD ports used to detect tracer outside of primary containment.
- Can determine size, location, and type of release.

https://www.nistm.org/PDF/Hick.pdf

Enhanced Leak Detection

- Required every 36 months for SW systems within 1,000’ of a drinking water well.
- Initial testing required within 18 months of being notified.
- UPA required to oversee implementation of recommendations from ELD test report.
- Very precise integrity test.

http://www.bayareatankcoatings.com/storagetank-portfolio/2015/3/15/coming-soon

CALIFORNIA Water Boards

Enhanced Leak Detection

- Must be able to detect a release correctly 95% of the time, with a 5% probability of false alarm.
- Liquid and vapor release detection required.
- Detects releases that SW monitoring methods would miss.
- Newly installed systems require ELD testing after install, this effectively eliminates significant releases.

http://www.bayareatankcoatings.com/storagetank-portfolio/2015/3/15/coming-soon

CALIFORNIA Water Boards

Programming Single-walled Systems

Control panel must be set up properly for:

- Leak size (3 gph vs 0.2 gph)
- Test frequency (hourly vs 30 days)
- Reaction to detected releases (shut down vs alarm)
- LLD equivalent leak rate
- Manifolded tanks
- Systems with minimal downtime
- Throughput/data collection time

https://img.freepik.com/premium-vector/digital-background-green-matrix-binary-computer-code_47243-763.jpg

CALIFORNIA Water Boards

Repairs

Piping

- SW piping* in need of repair or replacement must be upgraded with secondary containment (UST Regulations 2636(a)).
- Tightness test: 0.1gph at 150% operating pressure within 30 days of repair.

https://www.shutterstock.com/image-photo/fragments-old-castiron-water-pipes-260nw-624523112.jpg

Repairs

Piping

*Does not apply to SW vent, or riser piping installed before July 1, 2003 if equipped with proper overfill prevention equipment:

- §2635(c)(1)(B): Restrict flow at least 30 minutes before overfill and alarm at least 5 minutes before overfill or;
- §2635(c)(1)(C): Positive shut off at 95%

https://www.shutterstock.com/image-photo/fragments-old-castiron-water-pipes-260nw-624523112.jpg

Repairs

Tanks

- 2660(k): demonstrate that the tank is structurally sound, and repairs will prevent unauthorized releases due to structural failure or corrosion.
- Repairs dependent on tank material.

https://i1.wp.com/hazardhub.com/wp-content/uploads/2021/08/leaking-underground-storage-tanks-702x526.jpg

Repairs

Tanks

- Tightness test: Either volumetric or non-volumetric integrity test, 0.1gph within 30 days of repair.
- Tanks that have had a release and cannot be repaired must be permanently closed.

https://i1.wp.com/hazardhub.com/wp-content/uploads/2021/08/leaking-underground-storage-tanks-702x526.jpg

Coatings/ Linings

https://www.raiderpainting.com/blog/tank-coatings-best-defence-corrosion/

Coatings

- Help extend operational life of tank.
- Special inspector (professional engineer) must certify the tank is structurally sound before lining.
- UPA must deny lining if can not be demonstrated.
- Coating contractor must have proper license.
- Other local agencies may have additional requirements (ARB, Fire).

http://www.bayareatankcoatings.com/storagetank-portfolio/2015/3/15/coming-soon

Coatings

- Tanks can only be repaired via lining once.
- Tanks *upgraded* via lining that have a subsequent release can not be relined.
- Monitoring well must be installed for future unauthorized releases.
- Integrity testing required before returning to service.
- Inspect within 120 months of lining, and every 60 months thereafter.

http://www.bayareatankcoatings.com/storagetank-portfolio/2015/3/15/coming-soon

Coatings

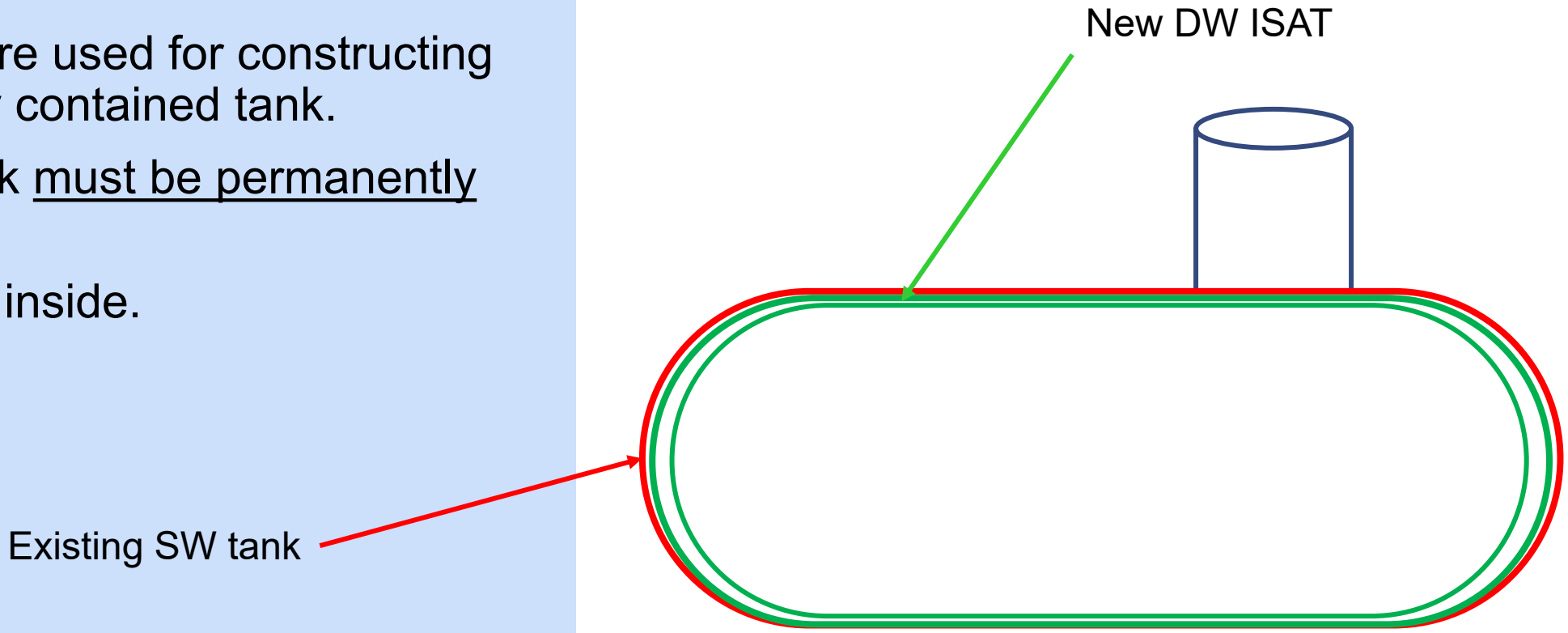
- Laminated SW tanks: still single-walled
- Clad SW tanks: still single-walled
- Lined SW tanks: still single-walled
- SW tanks with bladder: still single-walled

No amount of laminating, coating, cladding, or lining makes a single-walled tank double-walled.

http://www.bayareatankcoatings.com/storagetank-portfolio/2015/3/15/coming-soon

Internal Stand-Alone Tank Systems

- SW tank structure used for constructing new secondarily contained tank.
- Existing SW tank must be permanently closed.
- DW tank is built inside.



Internal Stand-Alone Tank Systems

- Alternative for sites where space is limited.
- Owner must obtain approval from the UPA prior to installation (among others).
- Possible to be spread thin as 2026 approaches.

https://media.istockphoto.com/id/147729477/photo/russian-babushka-or-matryoshka-doll-inside-the-other-dolls.jpg?s=170667a&w=0&k=20&c=rgQTdyE1f8nQqqxlja7U6sLahME5NAp7Sk8hyW8Pv-Q=

Internal Stand-Alone Tank Systems

- New DW system must be compatible with substance stored.
- ELD required before being placed in service.
- New tank must be VPH monitored, to include piping, UDC, sumps.
- Not always cost effective compared to conventional replacement.
- Water Board issued a statement in 2015 with additional details.

https://media.istockphoto.com/id/147729477/photo/russian-babushka-or-matryoshka-doll-inside-the-other-dolls.jpg?s=170667a&w=0&k=20&c=rgQTdyE1f8nQqqxlja7U6sLahME5NAp7Sk8hyW8Pv-Q=

Future Systems

January 1, 2026, all UST systems are required to be secondarily contained.

Any SW systems still in operation after December 31, 2025, will need to be permanently closed by January 1, 2026.

<u>Over 1,500 single-walled systems remain open.</u>

https://www.traveller.com.au/content/dam/images/h/c/w/n/image.related.articleLeadNarrow.300x0.h85o.png/1256342401000.jpg

Closing SW Tanks

Permanent closure requires:

- All residual liquid, solids, or sludges must be removed.
- Tank must be inerted if it could produce flammable vapors.
- Closed in place: filled with inert solid.
- Demonstrate an unauthorized release hasn't occurred.
- All piping must be removed.

This must be completed on or before December 31, 2025.

https://www.traveller.com.au/content/dam/images/h/c/w/n/image.related.articleLeadNarrow.300x0.h85o.png/1256342401000.jpg

Closing SW Tanks

Sampling requirements:

- Removed tanks require soil sampling at each end of the tank, two feet into the native material.
- Closed in place tanks require one sample beneath the mid point of the tank, or as approved by UPA.
- Every 20 feet of trench for piping.
- Groundwater if present in excavation.
- Must occur immediately after closure.

https://www.traveller.com.au/content/dam/images/h/c/w/n/image.related.articleLeadNarrow.300x0.h85o.png/1256342401000.jpg

DW Tanks with SW Piping

SW piping connected to a DW tank installed before July 1, 1987 must be replaced with piping satisfying H&SC 25291(a) except.

- Safe suction piping installed before July 1, 2003.
- Vapor recovery lines that do not hold standing fluid.
- Vent and fill risers that do not hold standing fluid and have proper OPE.

All piping installed after July 1, 2003 must be secondarily contained.

https://www.traveller.com.au/content/dam/images/h/c/w/n/image.related.articleLeadNarrow.300x0.h85o.png/1256342401000.jpg

SW Tanks with DW Piping

SW tanks connected to DW piping need to be replaced with DW tanks.

Replacement tanks are subject to HSC 25290.1.

Since the new DW tank is installed after July 1, 2004, the DW piping is subject to VPH monitoring, even if piping is from pre-July 1, 2004.

If the DW piping can not be VPH monitored, it needs to be replaced.

https://www.traveller.com.au/content/dam/images/h/c/w/n/image.related.articleLeadNarrow.300x0.h85o.png/1256342401000.jpg

Matrix of ***Nonmetallic*** Pipe Monitoring Applications
Gravity Flow, Vacuum (V), Pressure (P), and Interstitial Liquid Level Monitoring (ILLM)
(Enclosure to State Water Board letter dated February 29, 2008; Matrix Updated April 25, 2014)

Nonmetallic Pipe Manufacturer		**UL 971 pipe date stamped on or after July 1, 2005**		
Brand	**Secondary Containment Type and Size** (Coaxial reported as ID of PS; SOS reported as OD of SC)	**Fuels[6]**	**Open** (min. 5 psi rating on SC per UL)	**Closed** (min. 50 psi rating on SC per UL)
			Gravity Flow or Ambient ILLM	**Vacuum, Pressure, or Pressurized ILLM**
Advantage Earth Products, Inc.				
Electr-O-Fuze	Flexible; Coaxial (coil); Black 1½", 2", 3", 4"	MV,CT,HB,AM	Gravity Flow	V,P
	Flexible; Coaxial (sticks); Black 1½", 2", 3", 4"	MV,CT,HB,AM	Gravity Flow	V,P
Franklin Fueling/APT				
XP-150-SC	Flexible; Coaxial (coil); 1½"	MV,CT,HB,AM	Gravity Flow	V
XP-100, 175, 200	Flexible; Coaxial (coil); 1", 1¾", 2"	MV,CT,HB,AM	Gravity Flow	None
UPP	Flexible; Coaxial (coil); 1½", 2"	MV,CT,HB,AM	Gravity Flow	V, P
	Flexible; Coaxial (sticks); 1½", 2", 3", 4"	MV,CT,HB,AM	Gravity Flow	V, P
NOV Fiber Glass Systems				
Dualoy 3000/L	Rigid; SOS; 3", 4"	MV,CT,HB,AM	Gravity Flow	V, P
(Ameron)	Rigid; SOS; 6"	MV,CT,HB,AM	Gravity Flow	None
Dualoy 3000/LCX	Rigid; Coaxial (sticks); 2", 3"	MV,CT,HB,AM	Gravity Flow, AILLM[1]	V, P, PILLM[1]
(Ameron)	Rigid; Coaxial (sticks); 4"	MV,CT,HB,AM	Gravity Flow, AILLM[1]	None
Red Thread IIA	Rigid; SOS; 3", 4"	MV,CT,HB,AM	Gravity Flow	V, P
(Smith Fiberglass)	Rigid; SOS; 6"	MV,CT,HB,AM	Gravity Flow	None
NUPI				
Smartflex	Flexible; Coaxial (coil); 1¼", 1½", 2"	MV,CT,HB,AM	Gravity Flow	V, P
	Flexible; Coaxial (sticks); 1½", 2"	MV,CT,HB,AM	Gravity Flow	V, P
	Rigid over Flexible; Coaxial (sticks); 3", 4"	MV,CT,HB,AM	Gravity Flow	V, P
OPW-FCS				
C15, C20, C30	Flexible; Coaxial (coil); 1½", 2", 3"	MV,AM	Gravity Flow	None
C75, C10[4]	Flexible; Coaxial (coil); ¾", 1"	MV,AM	Gravity Flow	V, P
PGFC-2150[5]	Flexible; Coaxial (coil); 1½"	MV,AM	Gravity Flow	V, P
Western Fiberglass				
Co-Flex	Flexible; Coaxial (coil); 1½", 2", 3"	MV,AM	Gravity Flow, AILLM[2]	None
Co-Flex[4]	Flexible; Coaxial (coil); ¾", 1"	MV,AM	Gravity Flow, AILLM[2]	V, P, PILLM[2]
Co-Flex[3]	Flexible; Coaxial (coil); 1½"	MV,AM	Gravity Flow, AILLM[2]	V, P, PILLM[2]

https://www.waterboards.ca.gov/ust/tech_notices/docs/ust_construction_and_testing_requirements.pdf

Future Systems

Monitoring strategies that will be extinct January 1, 2026:

- ATG
- CITLD
- SIR
- GW monitoring
- Continuous vadose zone monitoring

This equipment can remain installed, but <u>not for monitoring purposes</u>.

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Future Systems

Monitoring strategies that must be used starting January 1, 2026:

- Tanks installed <July 1, 2004: continuous interstitial monitoring.
- Tanks installed >July 1, 2004: continuous interstitial monitoring using VPH monitoring.

https://www.traveller.com.au/content/dam/images/h/c/w/n/image.related.articleLeadNarrow.300x0.h85o.png/1256342401000.jpg

Resources/Contact Information

Local Guidance 113

- https://www.waterboards.ca.gov/water_issues/programs/ust/leak_prevention/lg113/

UST Construction, Monitoring, and Testing Requirements

- https://www.waterboards.ca.gov/ust/tech_notices/docs/ust_construction_and_testing_requirements.pdf

UST Statutes and Regulations

- https://www.waterboards.ca.gov/ust/regulatory/#regs

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Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS