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Environmental Protection
Agency

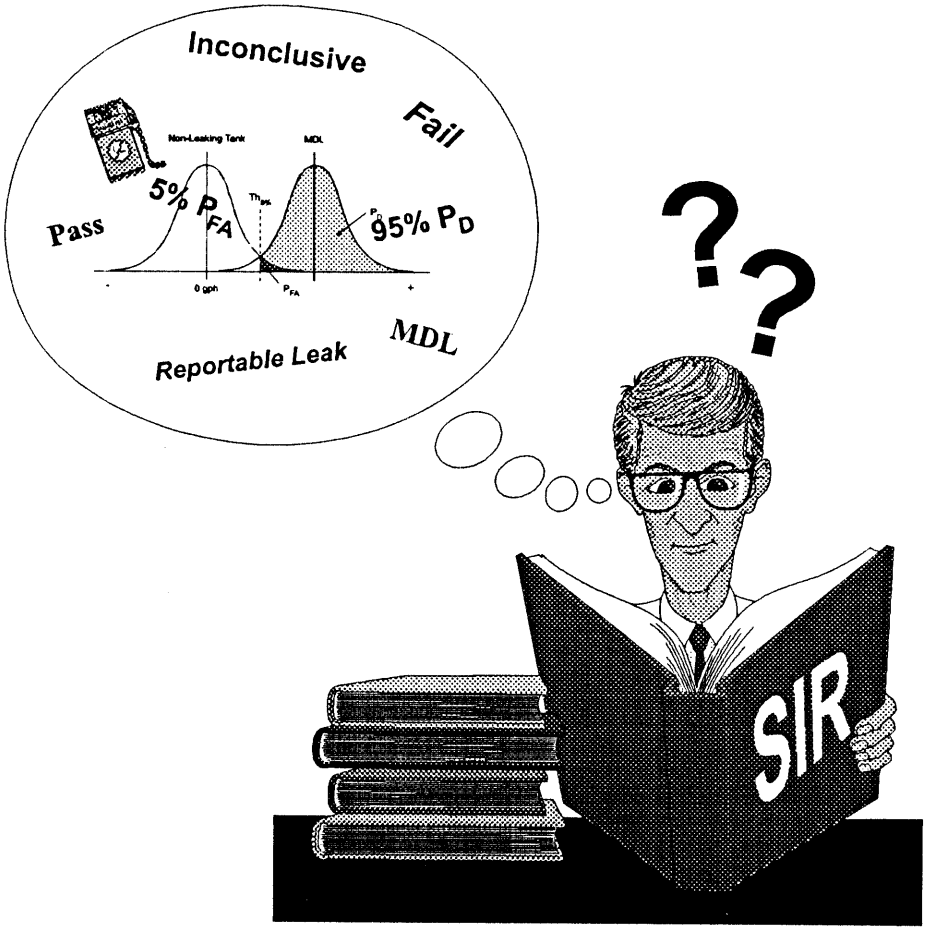
Solid Waste And
Emergency Response
5403W

EPA 510-B-95-009
September 1995

EPA

Introduction To Statistical Inventory Reconciliation

For Underground Storage Tanks



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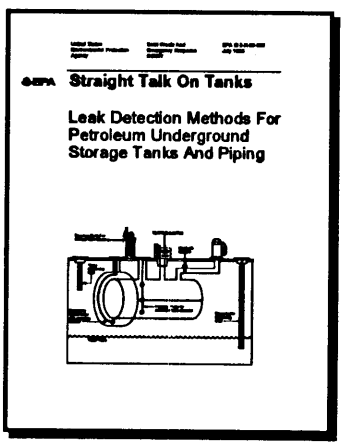
Why You Should Read This Booklet

Federal and state laws require underground storage tank systems (USTs) to have leak detection. One of the available leak detection methods is Statistical Inventory Reconciliation (SIR). In this method, a trained professional uses sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data.

SIR can allow the owner or operator of an UST facility to meet leak detection requirements without an extensive outlay of capital, using only the equipment that most facilities have readily at hand—a tank stick and a tank chart used for inventory control. The SIR analysis itself is usually provided as a service by vendors who charge a monthly fee based on the number of tanks.

This booklet provides basic information on the method—what it is, how it works, factors that impact data quality—to assist you in determining if SIR is appropriate to your needs.

If you need information on federal leak detection requirements and the various methods of leak detection available to you, see **Straight Talk on Tanks**. For a free copy, call the U.S. Environmental Protection Agency's (EPA's) toll-free Hotline at 800 424-9346 and ask for publication EPA 510-K-95-003.



How Does SIR Work?

On the face of it, SIR looks very similar to old-fashioned inventory control—the owner or operator, using simple equipment, tracks tank volumes, deliveries, and sales. However, the similarity ends there. Simple inventory control is relatively imprecise. Depending on your system throughput, you could be losing hundreds of gallons every month without realizing anything is wrong!

To many people, SIR may seem like magic. But it's based on sound mathematical principles.

By contrast, SIR analysis can be very sensitive and accurate. A SIR vendor can take the same inventory data and analyze them for releases so small that many would go unnoticed with inventory control. By using a month's worth of good tank data, it is possible for SIR methods to detect a release of just over 1½ pints per hour (that's about 145 gallons per month) from a tank or its product lines 95 times out of a hundred.

The mechanics of how SIR works are beyond the scope of this booklet. SIR vendors actually use a variety of statistical tools to evaluate inventory data, and no two vendors' methods are exactly alike—the information they collect and the results they provide can vary. Still, for fundamental release detection purposes, there are only three possible bottom-line responses for any SIR test: *PASS*, *FAIL*, or *INCONCLUSIVE*. These bottom-line responses are described below and on the following pages.

A 'FAIL' does not necessarily mean your system is leaking, but you must still notify your local UST agency.

PASS—According to the analyzed data, the UST system tests tight.

FAIL—Analyzed data indicate a loss of product from the system or an influx of groundwater. However, a *FAIL* does not *necessarily* indicate that your system is leaking. A *FAIL* may indicate miscalibrated dispensers, inaccurately metered deliveries, or stolen product. There is also a chance that a *FAIL* is a false alarm. **If you receive a *FAIL*, you must first notify your local UST regulatory agency.** Then, you should explore possible reasons for the *FAIL* (see page 7). Keep your local UST agency informed as to your findings.

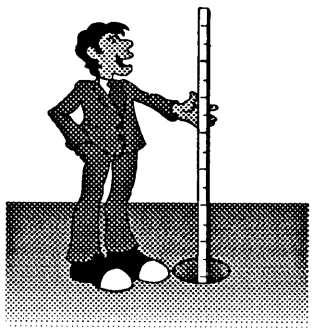
INCONCLUSIVE—Analyzed data cannot make the call. There is a chance that the information provided to the SIR vendor is so bad that it is not possible to make a determination. This often can be traced back to poor tank sticking or bookkeeping practices (for example, a new hire who has received inadequate training). Whatever the reason, an *INCONCLUSIVE* result means, in effect, that you have failed to perform leak detection on the UST in question for that month. You are in violation of federal leak detection requirements. Contact your state UST program office to find out local policy on how *INCONCLUSIVE* results are handled. See page 7 for additional information.

Necessary Equipment

One of the major attractions of SIR for UST owners and operators is that it does not require a large, up-front investment of capital—the primary cost is subscribing to the SIR vendor's services. The equipment needed to use the method is usually already found on-site at most UST facilities.

Gauge Stick Or Other Gauges

A gauge stick, made of wood or other non-sparking material, is used to measure the depth of liquid in the UST. Typically, such sticks are marked or notched in 1/8-inch increments starting with the bottom of the stick. It is important that the stick be in good condition. Sticks that have worn ends, cut-off ends, worn-off numbers, or worn-off varnish coatings are not acceptable and should be replaced.



Good sticking practices are essential to good SIR analyses.

Other forms of gauges can also be used if they are available and in good operating condition. Automatic tank gauges, for instance, can simplify measuring tank volumes. (Keep in mind, of course, that some automatic tank gauging systems can serve as acceptable monthly tank leak detection methods by themselves.)

Whatever form of gauge you choose to use, you must follow the SIR vendor's instructions carefully to gather useful data. For instance, many providers of SIR services require that the tank measurements are made to the nearest 1/8-inch. If you fail to follow the vendor's instructions, you may end up with inconclusive test results.

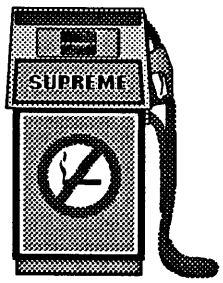
Pastes For Finding Fuel Or Water

If you use a gauge stick, you can improve the quality of your readings if you use a fuel-sensitive paste smeared over about six inches of the stick where you expect the fuel level to be. The paste changes color where it comes into contact with the fuel.

Similarly, you can use a water-sensitive paste on the end of the stick to monitor for the presence of water in the bottom of the tank. While water in the tank can come with your deliveries or as a result of condensation of moisture inside the tank, it can also come from groundwater leaking in through holes or through loose fittings high in your tank.

Tank Chart

The strapping chart used to convert stick measurements into gallons must be the right one for the tank. The chart should have stick measurements listed to 1/8 of an inch to minimize math errors that occur when using charts marked off to the nearest inch. SIR vendors can quickly determine if the chart is inappropriate to your tank, and will often generate a proper one for your tank.



Calibrated Dispensing Meters

A poorly calibrated totalizer can produce bad data that may be mistaken for some types of releases. While many SIR vendors can identify this pattern as a possible cause of a *FAIL*, it is wise to avoid the problem entirely. Keep your dispensers in good operating condition and have them periodically recalibrated as recommended by your equipment manufacturer and as required by state and local weights and measures agencies.

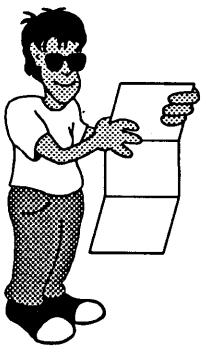
Forms

The SIR vendor typically provides forms on which daily stick readings, sales, and deliveries are recorded. These forms often resemble the inventory sheets usually maintained at UST facilities. In some instances, SIR vendors may allow submission of the data on a facility's own inventory sheets. Some vendors may also permit submission of data in electronic format, such as computer spreadsheets.

SIR Reporting And Recordkeeping

What You Should Provide To The Vendor

Although SIR vendors may ask for a variety of information, some of the more common elements include:



- Tank size (capacity, diameter, and length).
- Tank type, material of construction, and manufacturer.
- Product type.
- Date each stick measurement was taken.
- Daily opening stick measurement and volume.
- Daily closing stick measurement and volume.
- Daily sales volume.
- Gross deliveries over the course of the month.
- Thirty days of observations.

What The Vendor Should Provide To You

Vendors supply different levels of service to their clients. You will need to consult with individual vendors to find the collection of features you desire. However, there is a core of reporting elements that should be common to all SIR analyses (see sample on page 6). These include:

- Clear and timely reporting of results in terms of *PASS*, *FAIL*, or *INCONCLUSIVE*.
- Complete and annotated copies of inventory records used in the analysis, showing such problems as errors in delivery records or bad measurements tossed out by the test.
- Suggestions as to the likely cause of any test failure or inconclusive result.
- Instructions on follow-up actions to be taken in the event of a *FAIL* or *INCONCLUSIVE* (for example: "Notify your local UST agency of a failed test result within 24 hours").

☑ **Pass**

☐ **Fail**

☐ **Inconclusive**

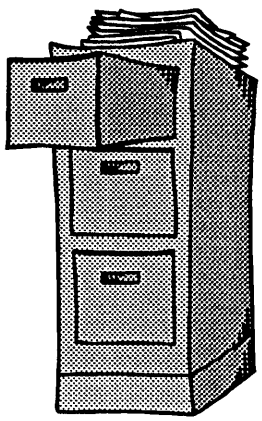
Also, in the case of quantitative testing methods, the form should report the calculated leak rate in gallons per hour and the leak threshold at which a leak would be declared based on the data provided for each tank. The minimum detectable leak rate (MDL) for your data may also be provided by some vendors. (See page 9.)

Your SIR vendor may also supply you with other useful information and services beyond the basics itemized above. SIR vendors may further provide:

- Off-site storage of leak detection records.
- Potential reasons for a *FAIL* other than a release of product:
  - Apparent product theft
  - Missed product delivery entry
  - Suspected totalizer miscalibration
- Potential reasons and possible solutions for any *INCONCLUSIVE* results.
- Possible location of leak within the system.
- Assessment of tank sticking practices.
- Special tank-specific strapping charts for those tanks needing them (such as tilted tanks and odd-sized tanks).

What You Should Keep On File

The minimal recordkeeping requirements for facilities using SIR are the same as for other release detection methods:



- All written performance claims pertaining to the SIR method used and the manner in which those claims were justified or tested by the vendor (such as a third-party evaluation of the method) must be kept on file for five years from the date you started using the method at the facility.
- The monthly SIR reports, along with the results of any other sampling, testing, or monitoring, must be kept for at least one year.

Sample Cover Sheet Of A Quantitative SIR Report

Monthly Statistical Inventory Reconciliation Report

Sammy's SIR Services
12739 N. South St.
Nowhere, USA

For the Period of: October 1-31, 1995
Facility: Joe's Gas & Grill
123 E. West Street
Anytown, XX

October 1995

Simple, concise description of system status.

Tank ID	Product	System Status	Measured Leak Rate	Threshold	MDL
001	Premium Unleaded	PASS	0.037	0.09	0.18
002[1]	Regular Unleaded	FAIL!	0.735	0.13	0.26
003[2]	Diesel	INCONCLUSIVE!	0.120	0.17	0.34

(All rates are in gallons per hour)

[1] Tank number 002 has an unexplained loss of product. You must notify your local underground storage tank agency of the failed test within 24 hours and take appropriate steps to confirm or refute.

[2] Tank number 003 could not be analyzed to the necessary performance levels. The tank has failed to meet federal leak detection requirements for the period in question. Improved tank sticking methods may help. See report detail for more information.

What to do if problems are discovered.

Detailed copies of inventory records included.

Copies of your analyzed inventory records accompany this report.

Keep this report on file for at least one year.

Questions? Call xxx-xxx-xxxx.

Number to call for help.

- Records of equipment calibration and maintenance must be kept for at least one year. Any schedules of required calibration and maintenance provided by the SIR vendor must be kept for five years from the date you began using the method at the facility.

You should check with your local UST agency to determine if there are any additional recordkeeping requirements.

What To Do When You Get A '*FAIL*'

When your UST system fails a SIR monthly analysis, you must report the incident to your local UST program agency within 24 hours or whatever time period your local agency requires.

HELP!

At the same time, you need to begin to investigate the cause of the failed test. Within seven days, you must determine the cause of the *FAIL* and report back to your local agency. Your SIR vendor may, on the basis of the test results, be able to provide you with areas to examine, such as a miscalibrated totalizer. You must have any defective equipment repaired or replaced immediately.

If the *FAIL* cannot be linked to equipment problems, you must have the system tightness tested or the site checked for evidence of a release (such as sampling in the excavation zone). You must report the results to the local agency. If a release is confirmed, the agency will provide instructions for any necessary cleanup action.

What To Do When You Get An '*INCONCLUSIVE*'

An *INCONCLUSIVE* means you have failed to meet leak detection requirements. However, the steps you must take upon getting an *INCONCLUSIVE* depend on the requirements of your local UST agency. In some instances, you may be required to perform a system tightness test to be sure the UST is not leaking. In others, you may be given an additional month to come into compliance. Be sure to know what is required locally. A list of UST agency phone numbers can be found in the back of this booklet.

An 'INCONCLUSIVE' means that you effectively have no leak detection for that month.

An *INCONCLUSIVE* should in no way be taken as demonstrating the failings of a given vendor's method—it is inherent to *all* methods. Even if vendors use terms other than "inconclusive," they represent the same condition.

In all cases, you will want to double check your operating procedures to see what caused the *INCONCLUSIVE* and prevent its recurrence. Your SIR vendor will provide assistance in locating the problem and offer suggestions to improve your data collection.

Answers To Frequently Asked Questions

"Can SIR be used on manifolded tanks?"

SIR methods can be used on tank systems that have multiple tanks linked together by siphon bars. This generally requires that each tank in the manifolded system be individually stuck for inventory measurements. As with single tank systems, no product deliveries or sales should be made during the time the sticking and totalizer readings are taking place.

Check with your local UST agency to determine if it permits use of SIR on manifolded systems or has additional requirements.

"Can SIR be used as an annual tightness test?"

For facilities that are still using inventory control with tightness testing as their means of leak detection, it is possible to use SIR in place of more traditional tightness tests such as an overfill test. The performance requirements for a tightness test are more stringent than for monthly monitoring methods, however, so be sure to check that your SIR vendor can meet those requirements. Tanks must be tested for releases of 0.1 gph with a probability of detection (P_D) of 95% and a probability of false alarm (P_{FA}) of 5%. To act as a replacement for piping tightness testing, the requirements are even more rigorous—the SIR method must be able to detect releases of 0.08 gph with a P_D of 95% and a P_{FA} of 5%. To find releases of this magnitude, SIR vendors often need several months of good data.

Be sure to contact your local UST agency to see if it allows use of SIR as an annual test. Also, remember that inventory control with tightness testing can only be used for a limited time. You may want to consider moving now to an approved method of monthly monitoring, such as automatic tank gauge systems, monitoring wells, or monthly SIR analyses.

There is no such thing as an "acceptable" leak. Any ***leak will cost you in the long run and should be fixed.***

"Why did a SIR vendor fail my tank for a leak under 0.2 gph?"

First of all, it is a misconception that *any* leakage into the environment is acceptable. Even small leaks over long periods of time can result in extensive contamination that can cost you substantial time and money for soil and groundwater clean up.

Secondly, the performance standard by which leak detection methods (including SIR) are measured says that leaks of 0.2 gph must be detected in 95 out of 100 times. Further, false alarms should not happen more than five times in a hundred. What this means is that the SIR vendor looks at the estimated leak rate determined for a tank—say 0.15 gph—and asks the question "What is the likelihood that the *true* leak rate is actually 0.2 gph?" On the basis of a statistical analysis of the data you provide the vendor, the SIR vendor can make the call as to whether your system tests tight or not.

Typically, a *FAIL* will be called for apparent releases of around 0.1 gph. See the question on page 10 on 'estimated leak,' 'threshold,' and 'MDL' for additional information.

"What is the difference between 'qualitative' and 'quantitative' SIR methods?"

Although there are many methods that are employed by vendors performing SIR analyses, they break down into two major classifications: *qualitative* and *quantitative*.

Qualitative methods do not provide estimated leak rates. When a vendor's qualitative method is evaluated to demonstrate its capability of meeting the EPA performance standard, it simply reports results in terms of *PASS, FAIL,* or *INCONCLUSIVE*. These results are compared with the evaluator's knowledge of which tanks are leaking in a test set of tank records.

Quantitative methods also categorize results in terms of *PASS, FAIL,* or *INCONCLUSIVE,* but they go further by actually providing a numerical estimate of the leak rate, typically in gallons per hour. In evaluating the performance of the method, the evaluator compares the method's estimates with the actual leak rates imposed on the test set of tank records.

NOTE: EPA neither certifies nor approves any leak detection vendor or method. Method evaluations are generally done by third-party testing organizations.

"What is this 'estimated leak rate,' 'threshold,' and 'MDL' stuff all about?"

These are rather technical statistical terms often used by quantitative SIR vendors to provide their clients with more detailed information on their analyses. They provide insight beyond the simple *PASS, FAIL,* and *INCONCLUSIVE*, including just how bad a leak appears to be (estimated leak rate) and how good the data are that you have been providing to the vendor for analysis (MDL).

The ***estimated leak rate*** is the number a quantitative SIR method comes up with for the amount of product your tank appears to be losing. The number is usually expressed in gallons per hour since the EPA regulations use those units.

This estimated leak rate is rarely, if ever, zero. All tanks, whether leaking or tight, will generally show a leak rate. The question is, is this leak rate significant? This is where the threshold comes in.

SIR vendors offer a diverse number of supplemental reporting options. Look over what each has to offer and choose the one that best meets your needs.

The ***threshold*** is basically an action level leak rate. That is, if the estimated leak rate exceeds the threshold leak rate, the SIR vendor declares a *FAIL*. It is important to note that the threshold is *not* a fixed number, such as 0.1 gph. Instead, it is typically the value associated with a fixed percentage set to the probability of false alarms (that is, declaring a leak on a system that is actually tight) the SIR vendor is willing to accept. EPA's regulations allow no more than 5% of analyses to turn out to be false alarms. However, many SIR vendors consider one failure in twenty analyses to be too high and set their thresholds to a 1% probability of false alarm.

Finally, the ***MDL*** is the ***Minimum Detectable Leak***. The MDL is the smallest leak rate the vendor can determine for the data provided with a P_D of 95% or better. The MDL is tied to the threshold and is usually twice the threshold leak rate. The MDL must be less than or equal to the EPA performance standard rate of 0.2 gph at a P_D of 95% and a P_{FA} of 5% in order to make a *PASS/FAIL* call. If the MDL exceeds the performance standard, your system cannot be given a *PASS*—an *INCONCLUSIVE* is the best you can get.

Fortunately, most vendors who provide this level of detail often provide a "plain English" translation as well.

"Can SIR be used as a monthly test of my piping, too?"

NOTE: State programs may require a different form of testing for lines. Check with your local UST agency.

Yes. SIR is a test of the entire UST system. Losses are reported regardless of their origins. So, whether you are losing product as a result of a tank leak, a line leak, miscalibrated equipment, or theft, a *FAIL* will result if the estimated leak rate exceeds the threshold for calling a leak. Remember, though, that if you are using pressurized lines, you will also need to have an automatic flow restrictor, shutoff device, or continuous alarm in place to fully meet piping leak detection requirements.

"How much does SIR cost?"

Unlike most other methods, SIR has no installation costs and equipment costs are minimal—a well-calibrated dispensing meter and a good stick are about all you need. While vendor costs will vary, monthly monitoring for a facility with three USTs costs about $800 to $1200 per year. SIR used as an annual tightness test costs about $200 to $600. (These figures are based on estimates in 1995.)

"There are so many vendors. How do I choose?"

Whether you have decided to invest in SIR services or other leak detection methods, the basic steps are similar:

- Request information from the vendors you are interested in. Compare their services, option packages, and prices to see which vendors best meet your needs. Ask for references and check them.
- Contact your local UST agency to see if it has a certification program for leak detection vendors. Consult the agency's list of certified service providers.
- Contact the Better Business Bureau to see if there have been any complaints lodged against the vendor.

Publications And Videos About USTs

PUBLICATIONS

TITLE

Musts For USTs: A Summary Of The Federal Regulations For Underground Storage Tank Systems
Booklet clearly summarizes federal UST requirements for installation, release detection, spill, overfill, and corrosion protection, corrective action, closure, reporting and recordkeeping. (About 40 pages.)

Normas Y Procedimientos Para T.S.A.
Spanish translation of **Musts For USTs.** (About 40 pages.)

Straight Talk On Tanks: Leak Detection Methods For Petroleum Underground Storage Tanks
Booklet explains federal regulatory requirements for leak detection and briefly describes allowable leak detection methods. (About 30 pages.)

Doing Inventory Control Right: For Underground Storage Tanks
Booklet describes how owners and operators of USTs can use inventory control and periodic tightness testing to meet federal leak detection requirements. Contains reporting forms. (About 16 pages.)

Manual Tank Gauging: For Small Underground Storage Tanks
Booklet provides simple, step-by-step directions for conducting manual tank gauging for tanks 2,000 gallons or smaller. Contains reporting forms. (About 12 pages.)

Don't Wait Until 1998: Spill, Overfill, And Corrosion Protection For Underground Storage Tanks
Information to help owners and operators of USTs meet the 1998 deadline for compliance with requirements to upgrade, replace, or close USTs installed before December 1988. (About 16 pages.)

Dollars And Sense: Financial Responsibility Requirements For Underground Storage Tanks
Booklet clearly summarizes the "financial responsibility" required of UST owners and operators by federal UST regulations. (About 16 pages.)

An Overview Of Underground Storage Tank Remediation Options
Fact sheets provide information about technologies that can be used to remediate petroleum contamination in soil and groundwater. (About 26 pages.)

Controlling UST Cleanup Costs
Fact sheet series on the cleanup process includes: *Hiring a Contractor, Negotiating the Contract, Interpreting the Bill, Managing the Process, and Understanding Contractor Code Words.* (About 10 pages.)

Federal Register Reprints
Not simple summaries, these reprints are extensive records of the rulemaking process including technical information, explanatory preambles, and the rules as they appear in the Code of Federal Regulations. Reprints dated 9/23/88; 10/26/88; 11/9/89; 5/2/90; and 2/18/93. Over 300 pages.

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Publications And Videos About USTs

PUBLICATIONS

TITLE	AVAILABLE FROM
Doing It Right Illustrates proper installation of underground tanks and piping for installation crews. Part 1: Tanks (24 minutes); Part 2: Piping (16 minutes). Cost: $25 **Doing It Right II: Installing Required UST Equipment** Illustrates installation of spill and overfill equipment, observation wells, and piping leak detection (23 minutes). Cost: $60 **Doing It Right** and **Doing it Right II** Set Cost: $75 **Keeping It Clean: Making Safe And Spill-Free Motor Fuel Deliveries** Making pollution-free deliveries to USTs. Includes Stage 1 vapor recovery, overfill prevention and spill containment. For fuel tanker drivers and UST owner/operators (25 minutes). Cost: $60 **Petroleum Leaks Underground** How liquids and vapors move in the subsurface and why early response to leaked petroleum is so important. Part 1: How Liquids Move (14 minutes); Part 2: How Vapors Move (15 minutes). Cost: $75 **Straight Talk On Leak Detection** Overview of the leak detection methods available for complying with federal regulations. Part 1: Straight Talk From Tank Owners (owners address the problems of UST compliance [5 minutes]); Part 2: Straight Talk On Leak Detection (30 minutes). Cost: $40	**Environmental Media Center** Box 30212 Bethesda, MD 20814 301 654-7141 800 522-0362 Visa and MasterCard accepted
Tank Closure Without Tears: An Inspector's Safety Guide Focuses on explosive vapors and safe tank removal (30 minutes). Video and Booklet Cost: $35; Booklet: $5 **What Do We Have Here?: An Inspector's Guide To Site Assessment At Tank Closure** Inspecting sites for contamination where tanks have been removed. Part 1: Site Assessment Overview (30 minutes); Part 2: Field Testing Instruments At A Glance (14 minutes); Part 3: Soil And Water Sampling At A Glance (7 minutes). Video and Booklet Cost: $45; Booklet: $5 **Searching For The Honest Tank: A Guide To UST Facility Compliance Inspection** Covers major steps of UST inspections from protocols and equipment to enforcement and followup; from cathodic protection to leak detection. Directed at inspectors, yet also helpful to owners and operators (30 minutes). Video and Booklet Cost: $40; Booklet: $5	**New England Interstate Environmental Training Center** ATTN:VIDEOS 2 Fort Road South Portland, ME 04106 207 767-2539

☆U.S. GOVERNMENT PRINTING OFFICE: 1995- 624-581 - 82353

State UST Program Office Numbers

Alabama Dept. of Env. Management
334 271-7986

Alaska Dept. of Env. Conservation
907 465-5203

Arizona Dept. of Env. Quality
602 207-4324

Arkansas Dept. of Pollution Control & Ecology
501 570-2801

California State Water Resources Control Board
916 227-4313

Colorado State Oil Inspection Office
303 620-4300

Connecticut Dept. of Env. Protection
203 424-3374

DC Env. Regulatory Administration
202 645-6080

Delaware Dept. of Natural Resources & Env. Control
302 323-4588

Florida Dept. of Env. Regulation
904 488-3935

Georgia Dept. of Natural Resources
404 362-2687

Hawaii Dept. of Health
808 586-4226

Idaho Dept. of Health & Welfare
208 334-0542

Illinois Office of State Fire Marshall
217 785-5878

Indiana Dept. of Env. Mgt.
317 233-6418

Iowa Dept. of Natural Resources
515 281-8135

Kansas Dept. of Health & Env.
913 296-1678

Kentucky Div. of Waste Mgt.
502 564-6716

Louisiana Dept. of Env. Quality
504 765-0243

Maine Dept. of Env. Protection
207 287-2651

Maryland Dept. of Env.
410 631-3442

Massachusetts Dept. of Public Safety
617 351-6000

Michigan Dept. of Natural Resources
517 373-8168

Minnesota Pollution Control Agency
612 297-8609

Mississippi Dept. of Env. Quality
601 961-5171

Missouri Dept. of Natural Resources
314 751-7428

Montana Dept. of Health & Env. Sciences
406 444-5970

Nebraska State Fire Marshal
402 471-9465

Nevada Dept. of Conserv. &Natural Resources
702 687-5872

New Hampshire Dept. of Env. Services
603 271-3644

New Jersey Dept. of Env. Protection
609 984-3156

New Mexico Env. Dept.
505 827-0188

New York Dept. of Env. Conservation
518 457-4351

North Carolina Pollution Control Branch
919 733-8486

North Dakota Div. of Waste Mgt.
701 328-5166

Ohio Dept. of Commerce
614 752-7938

Oklahoma Corporation Commission
405 521-3107

Oregon Dept. of Env. Quality
503 229-5774

Oregon Dept. of Env. Quality
503 229-6642

Pennsylvania Dept. of Env. Resources
717 772-5599

Rhode Island Dept. of Env. Mgt.
401 277-2234

South Carolina Dept. of Health and Env.Control
803 734-5335

South Dakota Dept. of Env. & Nat. Resources
605 773-3296

Tennessee Dept. of Env. & Conservation
615 532-0945

Texas Natural Resources Conservation Comm.
512 239-2000

Utah Dept. of Env. Quality
801 536-4100

Vermont Dept. of Natural Resources
802 244-8702

Virginia Dept. Env. Quality
804 527-5189

Virginia Dept. Env. Quality
804 527-5189

Washington Dept. of Ecology
206 407-7211

West Virginia Div. of Env. Protection
304 558-6371

Wisconsin Dept. of Industry, Labor & Human Relations
608 267-7605

Wisconsin Dept. of Natural Resources
608 267-7560

Wyoming Dept. of Env. Quality
307 777-7096

U.S. TERRITORIES

American Samoa Env. Protection Agency
684 633-2304

Commonwealth of Northern Mariana Islands Div. of Env. Quality
607 234-6984

Guam Env. Protection Agency
671 646-8863

Puerto Rico Env. Quality Board
809 767-8109

Virgin Islands Div. of Env. Protection
809 774-3320

EPA

United States
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