



# **New Underground Storage Tank (UST) Requirements**

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State Water Resources Control Board  
New UST Equipment Workshops  
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# Presentation Outline

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- Background
- Post-installation enhanced leak detection (ELD) testing
- Vacuum, pressure, or hydrostatic (VPH) continuous monitoring of interstitial space



# Background: Rationale for New Requirements

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- Study of operating USTs (Field-Based Research) indicated widespread vapor releases, even from double-walled USTs
- Secondary containment testing showed similar failures
- Number of new releases began to increase
- New UST legislation enacted to address findings



# Background:

## Overview of AB 2481 Provisions

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- Design and Construction Standards for New Post July 1, 2003 USTs
  - Product-Tight
  - Full Secondary Containment (e.g., double-walled vent and vapor recovery piping)
- Enhanced leak detection (ELD) for double-walled UST systems
- Annual spill bucket testing
- Red Tag & Administrative Enforcement Authority



## Another AB 2481 Provision...

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- Enhanced Leak Detection (ELD) Post-Installation Testing
  - For new USTs installed on or after July 1, 2003
  - Provides one-time “snapshot” of vapor-tight construction

# AB 2481 (2002) & AB 1702 (2003)

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- Vacuum, Pressure, or Hydrostatic (VPH) Continuous Monitoring Methods
  - For new USTs installed on or after July 1, 2004
  - Full-time evaluation of primary and secondary containment



# Enhanced Leak Detection

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Presented by:

Erin Ragazzi



# Enhanced Leak Detection “Enhanced Tracer Tight® Test”

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## ○ Existing USTs

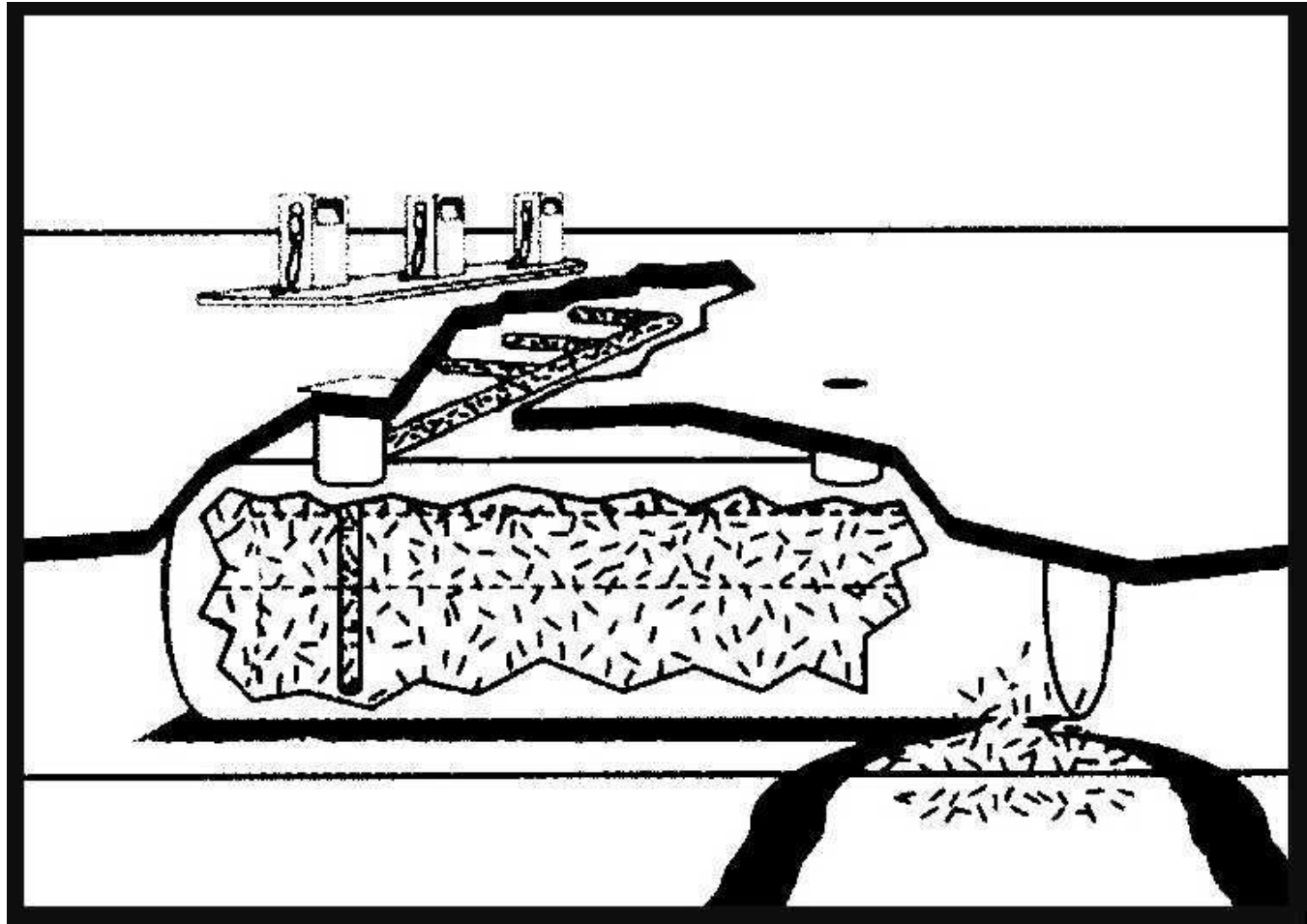
- For USTs located within 1,000 feet of a public drinking water well
- Vertical probes installed through surface
- On-site testing may take up to 14 days if samples are shipped

## ○ New USTs

- For all new USTs installed on or after July 1, 2003
- Horizontal probe array installed during construction of facility
- Mobile lab used so testing typically may be completed in 2 days

# Vapor-Tight Post-Installation Testing

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# Vapor-Tight Post-Installation Testing Topics of Discussion

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- Summary of post-installation ELD testing performed to date
- Contractor experience
- Phase 1 Enhanced Vapor Recovery (EVR) equipment (e.g. spill buckets) installation and testing concerns

# Final ELD Tests Completed

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<u>Month</u>	<u>Facilities Tested by Month</u>	<u>Total Facilities Tested</u>
October 03	4	4
November 03	17	21
December 03	25	46
January 04	37	83
February 04	27	110
March 04	34	144
April 04	26	150
May 04	29	179

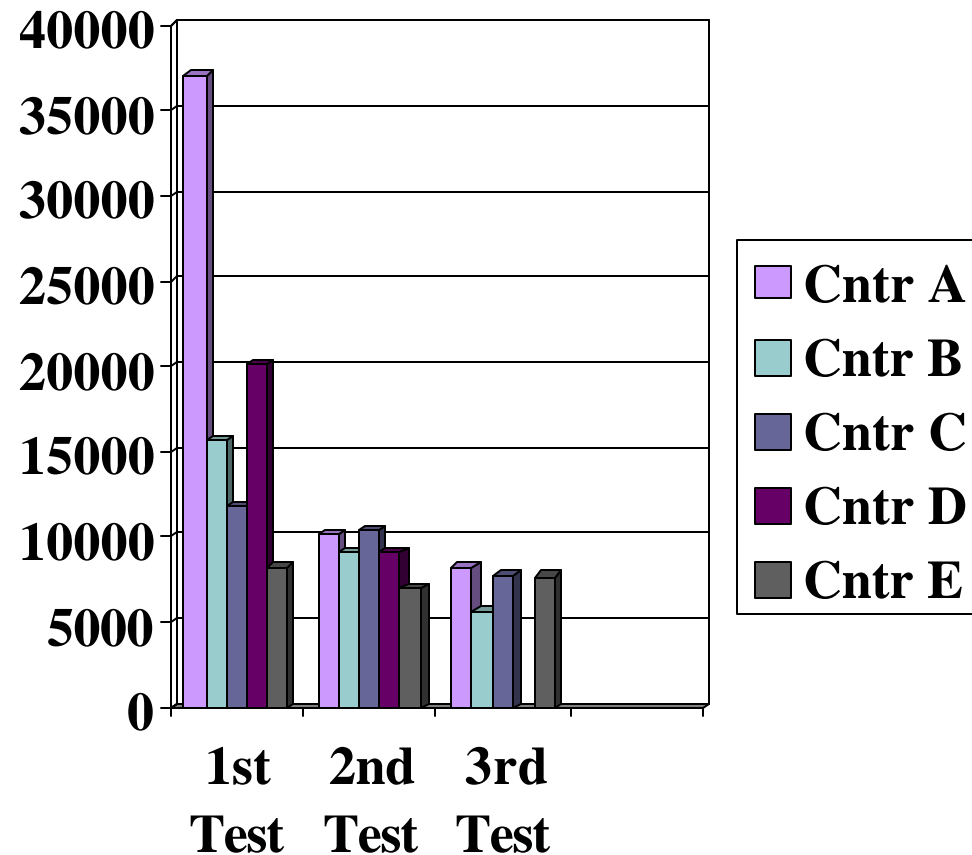
# ELD Service Capacity and Backlog

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<u>Month</u>	<u>Estimated Backlog</u>	<u>Service Capacity</u>	<u>Mobile Labs</u>
Sept 03	0	4	1
Oct 03	4	18	3
Nov 03	15	34	4
Dec 03	30	27	6
Jan 04	3	56	8
Feb 04	0	63	9
Mar 04	0	70	10
Apr 04	0	70	10
May 04	0	70	10

# Experience Gained by Contractors

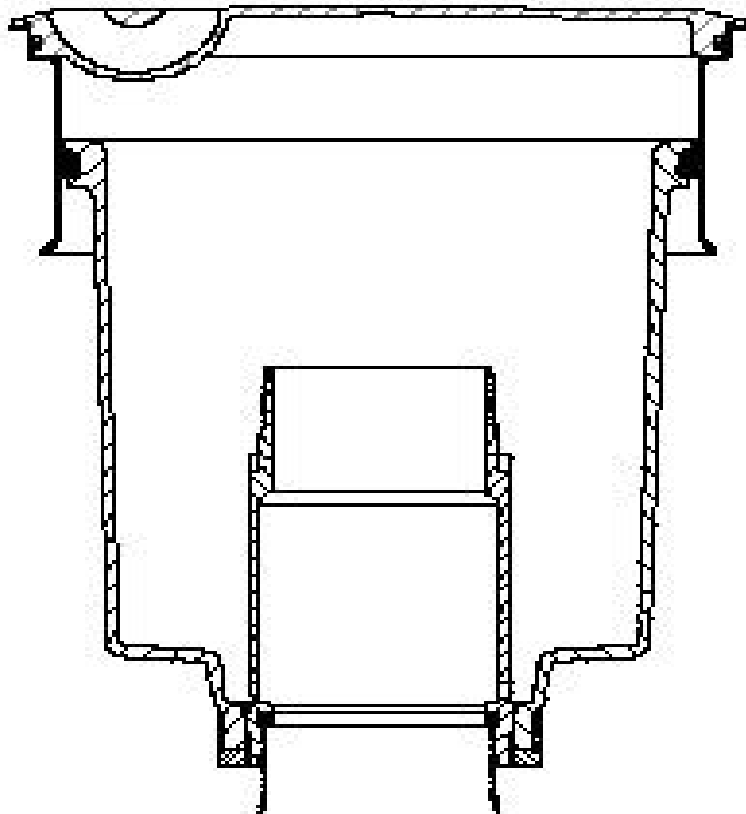
- Contractors A, B, C and D lowered final test costs by assembling facilities with fewer leaks
- Contractor E started well and displays consistent quality
- Good assembly and pretesting saves time and money
- Contractors have option of learning and performing their own pretest



# Spill Bucket Installation and Testing Concerns

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Vapor Recovery



- Ensure Phase 1 EVR equipment is properly installed and torqued per Executive Order specifications
- Ensure inoculation of tracer is performed consistent with method approved by Phase 1 EVR equipment manufacturer

# For Your Reference - An Example of Torque Settings

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- Torque settings for rotatable adaptors on Phase 1 Enhanced Vapor (EVR) equipment
  - Listed in approved California Air Resources Board (ARB) Executive Orders (EOs) for Phil-Tite, OPW, EBW, and CNI
  - Maximum, 108 pound-inch average static torque
- Refer to ARB EOs for appropriate torque settings on other Phase 1 EVR components

Torque Wrench???




# Joint ARB/SWRCB Letter

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- Sent to Phase 1 EVR equipment manufacturers
- Responses indicated the following inoculation methods<sup>1</sup> and under warranty:
  - Phil-Tite: Vacuum & Displacement
  - OPW: Displacement
  - EBW: Displacement
  - CNI: Vacuum & Displacement

<sup>1</sup> "Vacuum" refers to using ~ 29 inches of mercury to prepare for the introduction of the tracer compound. "Displacement" refers to introducing the tracer gas mixture by displacing air already in the UST system.



# Vacuum, Pressure, and Hydrostatic (VPH) Continuous Monitoring

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Presented by:

Scott Bacon



# Monitoring Methods for Newly-Installed UST Systems

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- Vacuum, pressure, or hydrostatic (VPH) methods for continuous monitoring of interstitial space
- Evaluation and approval process for monitoring equipment
- Current status of equipment development



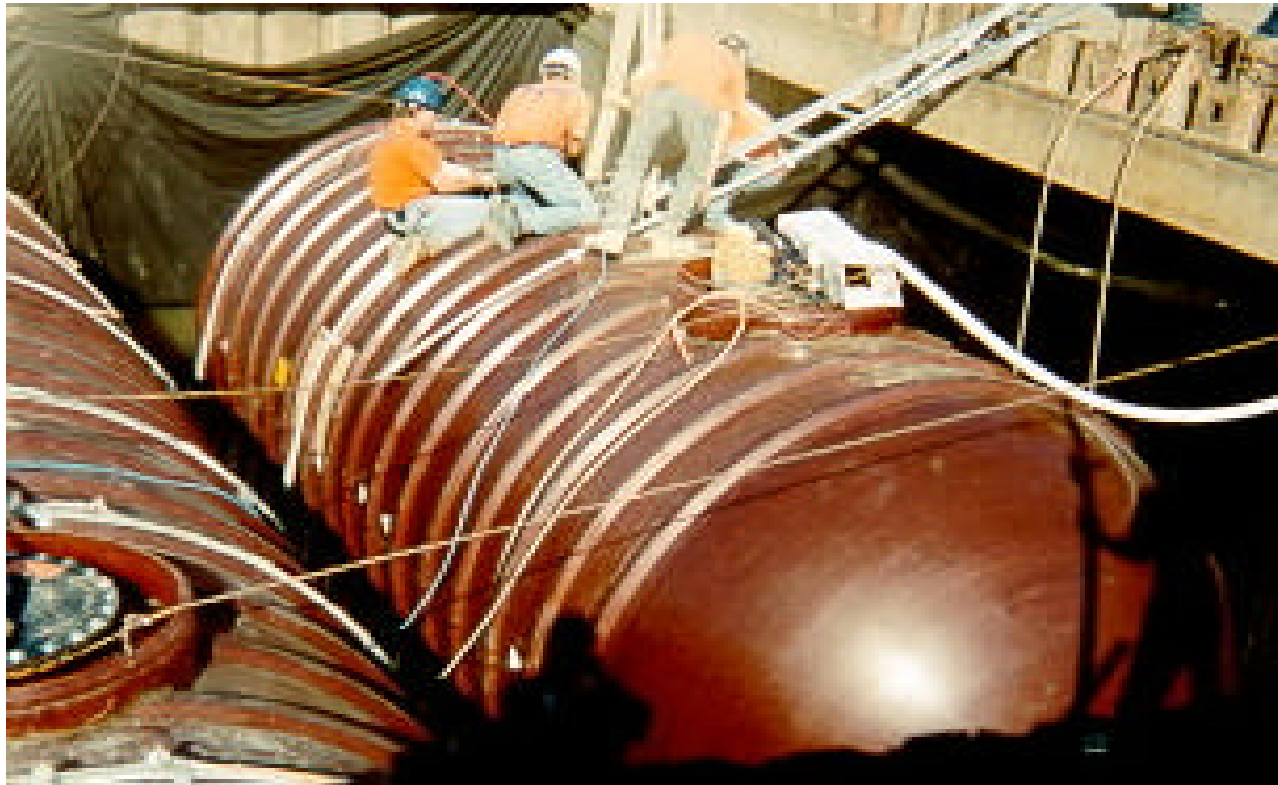
# New Requirement

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- New USTs installed on or after July 1, 2004: VPH methods for continuous monitoring of primary and secondary containment
- Purpose: to detect a breach in the primary or secondary containment before the liquid- or vapor-phase of the hazardous substance stored is released into the environment

# Installed USTs - VPH Monitoring

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# VPH Monitoring

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- Continuous monitoring of tanks and piping using:
  - vacuum (below atmospheric pressure)
  - pressure (above operating pressure)
  - hydrostatic (interstitial liquid level monitoring)

Note: Applies only to UST systems installed on or after July 1, 2004



# Monitored Components

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- VPH Monitoring will be required on:
  - interstitial space of double-walled tanks
  - interstitial space of double-walled piping, including:
    - product piping (from top of tank to bottom of shear valve)
    - vent/vapor recovery piping

**Note: Double-walled sumps and UDC with VPH monitoring may be used to contain single-walled piping components**



# VPH Performance Criteria

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- VPH monitoring systems must:
  - detect leaks in primary and secondary containment
  - be sensitive to liquid and vapor leaks
  - detect leaks before the stored hazardous substance enters the environment
  - operate continuously (not a one-time test)

# ILLM - Interstitial Liquid Level Measurement (Hydrostatic)

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- On May 20, 2004, the SWRCB adopted emergency regulations defining ILLM:
  - continuously monitors the liquid level within a liquid-filled interstitial space
  - capable of detecting a breach in the primary or secondary containment of the component(s) being monitored before the hazardous substance stored is released
  - liquid in the interstitial space shall be maintained at a pressure greater than the operating pressure found within the component(s) being monitored



# VPH Monitoring and Secondary Containment Testing

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- Components monitored with VPH do NOT require secondary containment testing!
  - “Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment ... are exempt from periodic secondary containment testing.”
    - CCR, Title 23, Section 2637(a)(6)



# VPH Approval Process

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- All monitoring equipment and methods (including VPH systems) are required to undergo:
  - third-party evaluation in accordance with EPA standard protocol or equivalent
  - electrical and fire-safety approval



# VPH Approval Process - Third-Party Evaluation

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- Third-Party Evaluation Must:
  - include functional testing of equipment under conditions that simulate interferences likely to be found in the field
  - be based on functional testing, not theoretical calculations
  - evaluate all portions of the actual leak detection equipment to be used in the field
    - testing of scale models or “prototype” systems does not satisfy the third-party evaluation requirement



# VPH Approval Process - Review of Evaluation

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- National Work Group on Leak Detection Evaluations (NWGLDE)
  - independent work group, formed in 1993
  - 10 members (state and federal UST regulators)
  - helps to eliminate duplicate efforts among regulatory agencies across the nation
  - LG-113 is based on NWGLDE's National List
  - <http://www.nwglde.org>



# VPH Approval Process - SWRCB Staff Activities

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- Work with leak detection manufacturers to:
  - define and clarify performance criteria
  - identify acceptable testing organizations and evaluation protocols
  - clarify third-party evaluation requirements and evaluation review/approval process
- Work with NWGLDE to expedite review process

# VPH Development Status

(as of June 15, 2004)

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- Systems currently under review by NWGLDE: **5**  
(4 vacuum for tanks & piping, 1 pressure for tanks)
- Systems currently undergoing third-party evaluation: **2**  
(vacuum systems for tanks & piping)
- Systems approved by NWGLDE, but awaiting fire safety approval: **3**  
(1 pressure for piping, 2 vacuum systems for tanks)
- Systems fully approved: **3**  
(2 hydrostatic for tanks, 1 vacuum for tanks & piping)



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