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State Water Resources Control Board

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Arnold Schwarzenegger
Governor

January 30, 2004

Mr. Mike Chapman, Chairman
California CUPA Forum Board
3700 Chaney Court
Carmichael, CA 95608

Dear Mr. Chapman:

POST-INSTALLATION TESTING AND VACUUM, PRESSURE, OR HYDROSTATIC METHODS FOR CONTINUOUS MONITORING OF NEW UNDERGROUND STORAGE TANK SYSTEMS

Thank you for your letter dated December 19, 2003, regarding concerns by some local agencies about the new requirements for post-installation enhanced leak detection (ELD) testing and vacuum, pressure or hydrostatic (VPH) methods for continuous monitoring of underground storage tanks (USTs). We recognize that this is a difficult time for local agencies overseeing the implementation of these new requirements. This letter provides a rationale for the new requirements, and the enclosure responds to your letter's specific concerns.

As background, it is helpful to review the reasons for providing containment of the hazardous substances stored in USTs. Containment is needed to prevent new releases and the cleanups they entail. Containment is needed to protect the many Californians who currently drink untested water from their private wells. Containment is needed because gasoline vapors are highly flammable. Containment is also needed because of the high costs of cleanup. Whether funded directly by California businesses or by the Cleanup Fund through California taxpayers' purchases of gasoline, current annual expenditures for UST cleanup are in excess of hundreds of millions of dollars.

Previous improvements to UST requirements, including the 1998 upgrade, led to the expectation that a UST whose owner/operator complied with applicable requirements would achieve this needed containment. However, beginning in 2001 and into early 2002, two separate lines of evidence came to light that contradict this expectation. Secondary containment testing requirements were being newly carried out and were demonstrating widespread problems with the integrity of secondary containment, even though designed, constructed, and monitored in accordance with existing requirements. Furthermore, the results of the Field-Based Research study we sponsored, which was conducted by the University of California, Davis and scientifically peer-reviewed, indicated that vapor releases from both single-walled and double-walled tanks were widespread. As you noted in your letter, the failure rate for existing system design was greater than 60% using ELD. These results removed any doubt that the expectation of containment was no longer valid, and the number of new release cases has continued to grow.

California Environmental Protection Agency



Given that the existing design, construction, and monitoring requirements were shown to be failing to provide full containment of hazardous substances, the requirements of Assembly Bill (AB) 2481 (Statutes 2002, Chapter 999) were developed. AB 2481 provides two significant improvements. First, new UST systems installed on or after July 1, 2003, are to be vapor-tight, as demonstrated by post-installation testing using ELD or the equivalent. Although early in the implementation of this requirement there were reported high failure rates, expenses, and delays for newly constructed UST systems, our understanding is that currently the situation is significantly improved. Currently, the rate of failure for new UST systems that pass the recommended pre-test is extremely low, if not zero. We understand that an important reason for the improved pass rate is that new USTs are being constructed more carefully, now that a sensitive post-installation test is required before the UST can be put into service. Improved construction benefits not only the owner but also the public and the environment. This AB 2481 improvement provides a one-time “snapshot” that the UST system, as installed, is not leaking to the environment.

Second, AB 2481 imposed a requirement for VPH methods to continuously monitor new UST systems, to ensure their long-term performance¹. Although the requirement for continuous monitoring has been in effect since 1985², the upgrade to VPH methods was to ensure detection of any release before it could escape the secondary containment. Further, these methods essentially amount to full-time integrity testing of both the primary and secondary containment of the UST. We believe that VPH methods are the best available technology and have a decades-long track record elsewhere in the world of providing reliable containment of hazardous substances. To reflect this best available technology, UST regulations relieve owners and operators of UST systems that are continuously monitored using VPH methods from the requirement to conduct triennial secondary containment testing indefinitely into the future.

The two improvements mentioned above will result in UST systems that are vapor-tight upon installation and are operated such that leaks will be reliably detected prior to release to the environment. Taken together, these improvements are the best available approach to minimizing new cleanup costs in California. To seek postponement of these requirements would be to tell Californians that, even though the technology exists for systems to be built and operated to prevent leaks, it is acceptable for USTs to leak. The goal expressed by the Legislature in AB 2481 was to ensure that a breach in the primary or secondary containment would be detected before it is released to the environment. We continue to believe that goal provides the level of protection of human health, safety, and the environment expected and deserved by Californians.

¹ AB 1702 (Statutes 2003, Chapter 42) later delayed the effective date for new systems installed on or after July 1, 2004.

² California Code of Regulations, Title 23, Chapter 16, Section 2632(c)(2)

If you have any questions, please call me at (916) 341-5752.

Sincerely,

Original Signed by

Elizabeth L. Haven, Manager
Underground Storage Tank Program

Enclosure

cc: Ms. Janet Ortiz
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**RESPONSES TO SPECIFIC CONCERNS EXPRESSED IN
CAL CUPA FORUM BOARD LETTER DATED DECEMBER 19, 2003**

1. “Obvious problem over lack of approved continuous monitoring equipment”
 - ◆ Recognizing that the timing is critical, we have been working diligently with manufacturers, third party testing evaluators, and the National Work Group on Leak Detection Equipment (NWGLDE) to ensure that vacuum, pressure, or hydrostatic (VPH) monitoring methods are approved and available by July 1, 2004. In March 2003, SWRCB staff hosted a symposium to discuss the VPH continuous monitoring requirement and solicit discussion among regulators, leak detection equipment manufacturers, and third party testing evaluators. We followed up with a document dated April 30, 2003 that captured the important points covered in the symposium. Additionally, on January 12, 2004, we sent a letter to manufacturers of VPH continuous monitoring equipment to make sure we continue to work together as the July 2004 deadline approaches, and local agencies received copies of this letter.
 - ◆ As of the date of this letter, a hydrostatic tank monitoring method has been fully approved. Five VPH methods have completed their third party evaluation and submitted them to the NWGLDE for approval. In addition, four VPH methods are undergoing third party testing. There is one vacuum system that has been approved by the NWGLDE for tanks but is awaiting its Underwriters Laboratories (UL) listing.

2. “Major concern exists over interpretations arising from fluctuations in pressure, vacuum or liquid, and the maintenance of the equipment.”
 - ◆ All VPH methods for continuous monitoring must be evaluated by an independent third party testing laboratory to comply with specific performance standards. [California Code of Regulations, title 23, section 2643(f).] Additionally, once the equipment is certified by an independent third party testing laboratory, the certification is submitted to the NWGLDE for approval. Both of these steps help ensure that reliable and functional equipment is certified to meet the requirements.
 - ◆ All monitoring equipment, including equipment used to maintain a continuous VPH monitoring system, must be tested annually as part of the annual “Monitoring System Certification”. [California Code of Regulations, title 23, section 2637(b).] All monitoring equipment, regardless of what type of monitoring it performs, should be maintained properly as directed by the monitoring equipment manufacturer or as needed based upon inspection of the equipment.

3. “LIAs have questioned the added cost to benefit of these continuous monitoring systems in light of other new requirements....”
 - ◆ While there is an increase in the up-front cost associated with installing and maintaining a VPH method for continuous monitoring, the operation of this system provides better assurance for protection of the environment. Portions of UST systems under continuous VPH monitoring are not subject to secondary containment testing because both the primary and secondary containment structures are evaluated continuously. Furthermore, the purpose of the VPH method is to detect a release from either primary or secondary containment before it can reach the environment. The potential cleanup costs far

outweigh the additional up-front costs associated with installation of VPH methods for continuous monitoring.

4. “The SWRCB should re-evaluate the need for this ‘unproven’ approach to environmental protection through continuous monitoring.”
 - ◆ As noted above, all leak detection methods must be evaluated by an independent third party testing laboratory.
 - ◆ Hydrostatic monitoring methods for tanks have long been in use in California. And, although VP continuous monitoring may be new to California, this technology has a decades-long history of use as an effective and “proven” technology elsewhere in the world.

5. “LIAs have long been troubled by the exclusivity of the Tracer Tight ELD test.”
 - ◆ Enhanced leak detection (ELD) was initially required for UST systems that posed the greatest risk to California’s drinking water supply (i.e., for UST systems located within 1,000 feet of a public drinking water well). As the best available test method, it was selected for use. Assembly Bill (AB) 2481 (Statutes 2002, Chapter 999) expanded the use of ELD to ensure that new USTs are installed product tight (to prevent both liquids and vapors from escaping to the environment). AB 2481 provided two additional options for post-installation testing: (1) an inert gas pressure test certified by a third party and approved by the SWRCB; or (2) a test method deemed equivalent to ELD and approved by the SWRCB in regulation. [Health and Safety Code, Chapter 6.7, section 25290.2(i).] As of the date of this letter, the SWRCB has not been asked to approve either an inert gas pressure test or a test equivalent to ELD.
 - ◆ While there is only one test method that meets the ELD requirement, there are three vendors that may perform the Enhanced Tracer Tight® test method: Praxair Services Inc. (formerly Tracer Research Corporation); Shirley Environmental; and CGRS.

6. “LIAs are equally concerned that the test may be more sensitive than UST construction technology”
 - ◆ Existing UST equipment can be installed to pass the more sensitive post-installation testing requirement. UST components (e.g., tanks, piping, sumps, fittings, etc.) constructed of various materials (e.g., fiberglass, steel, etc.) and by many manufacturers have passed this more sensitive post-installation testing method since testing began in September 2003.
 - ◆ Since September, 2003, 100 new UST facilities have successfully completed post-installation ELD and are open for business.

7. “In correspondence from Praxair, they state that, ‘This test is extremely difficult to pass (60% statewide failure rate)...’”
 - ◆ ELD testing of UST systems is not new to the California UST Program¹. The concept of ELD was initially implemented as part of Senate Bill 989 (Statutes 1999, Chapter 812),

¹ ELD testing is required for all UST systems located within 1,000 feet of a public drinking water well and installed prior to July 1, 2003 at the following frequency: for UST systems with a single-walled component, every 36 months; and for double-walled UST systems, once by January 1, 2005. [H&S Code, Chapter 6.7, §25292.5(a); CCR, Title 23, §2644.1.]

and later also incorporated into AB 2481, to allow use of the best available technology to ensure the UST systems are both liquid and vapor tight. The ELD test method has been used as a tank and line tightness test throughout the United States for many years. Additionally, this test method was used to evaluate randomly selected operating UST systems as part of the Field-Based Research (FBR) Project. FBR Project results indicated vapor releases were present at more than 60% of the systems tested. We believe that the 60% failure rate cited by Praxair Services Inc. reflects the tightness of existing UST systems tested as part of the FBR Project, not newly constructed UST systems tested at installation.

8. “The test appears to be extremely sensitive to fugitive vapors that may not be associated with a system leak, but rather the test method and/or tester. LIAs and operators are frustrated by a test that can fail one day and pass the next test without repairs having been made to the system, the failure of the test to pinpoint leaks, and the need to break concrete to investigate failures.”
 - ◆ The Enhanced Tracer Tight® test method is a third party certified tank and line tightness test method that is listed in LG letter 113. As with all tank and line tightness methods listed in LG 113, the test method has been third party certified to provide a certain leak rate sensitivity (in this case, 0.005 gal/hr) with a probability of detection of at least 95% and a probability of false alarm no greater than 5%. As long as the method is performed properly, it is certified to detect any leak at a rate of 0.005 gal/hr or greater. Based on the third party certification and listing in LG 113, we have confidence this test method will detect leaks that are 0.005 gal/hr or greater; in the process, some leaks of a smaller volume may also be appropriately detected. We plan to follow up on any specific information we receive regarding test inconsistencies.
 - ◆ Breaking concrete to investigate failures is generally limited to instances where the piping has not been appropriately constructed. It should not be necessary for components other than piping, because these components are now being installed to be accessible, in sumps. Pre-testing is an option that minimizes the need to break concrete.
9. “The waiting time of 7-30 days causes excessive delays especially when a re-test(s) is needed.”
 - ◆ Initially there were unfortunate delays in obtaining post-installation testing services. However, we understand that as of the date of this letter there is no longer a backlog of facilities awaiting testing.
 - ◆ Use of mobile testing labs has significantly reduced post-installation testing times.
10. “LIAs have received test results indicating small amounts (in parts per million) of tracer detected and yet it was declared a pass. There has been no correlation provided between the detected levels and the approved leak rate (pass/fail threshold).”
 - ◆ We are not aware of small amounts of tracer escaping from the system resulting in a pass. Please forward this specific information so that we can follow up.
 - ◆ Regarding pass/fail threshold, the Enhanced Tracer Tight® test is semi-quantitative, so the exact leak rate is not reported or determined for each test. As with all tank and line tightness methods listed in LG 113, the test method has been third party certified to provide a certain leak rate sensitivity (in this case, 0.005 gal/hr) with a probability of

detection of at least 95% and a probability of false alarm no greater than 5%. As long as the method is performed properly, it is certified to detect any leak at a rate of 0.005 gal/hr or greater. In order for the test method to be able to detect any 0.005 gal/hr leak at least 95% of the time, the test must be sensitive enough to detect leaks at rates less than 0.005 gal/hr. The test method is performed using a specific amount of tracer over a specific period of time in order to meet the sensitivity of its certification (0.005 gal/hr). Because the test method is semi-quantitative, the test method is certified such that any detection of tracer is a “fail” that will require the UST to be fixed and re-tested. Based on the third party certification and listing in LG 113, we have confidence the test method will detect leaks that are 0.005 gal/hr or greater; in the process, some leaks of a smaller volume may also be appropriately detected.

11. “LIAs are questioning whether the dry method, recently developed by Praxair to accommodate the new installation test requirement, is finding leaks or fugitive vapors from under dispenser containment, sump tops or the tester.”
 - ◆ Whether it is a dry or a wet space that is inoculated, the test remains equivalent.
 - ◆ Detections of tracer represent a leak from the portion of the system inoculated with the tracer, which does not include sumps or under-dispenser containment.
 - ◆ We are not aware of any tracer detections due to contamination from tester clothing or sloppy handling of tracer, either from ELD testing of existing (installed prior to July 1, 2003) or new systems (installed on or after July 1, 2003). We plan to follow up on any specific information we receive regarding such detections.

12. “...pre-test using helium or a Praxair pre-test because of the high failure rate...”
 - ◆ High-sensitivity pre-testing of UST systems prior to backfill, which is not required, gives the owner/operator and contractor the best assurance that the new UST systems are installed properly and will pass the ELD test after concrete is poured. It is our understanding that the number of “failures” detected during pre-tests is steadily declining, as contractors become more accustomed to constructing and installing UST systems to pass this more sensitive post-installation tightness test. This improvement indicates to us the importance of using adequate construction techniques and following the manufacturer’s installation instructions.
 - ◆ Post-installation testing must be performed after installation to ensure the proper installation of the UST system and that no damage occurred during the final stages of installation (e.g., pouring of concrete, placement of dispensers, etc.). We recognize that the shift from previous post-installation test methods (which tested tanks and pipes for liquid leaks of 0.1 gallon/hour) to a test method with an increased sensitivity to both liquid and vapor leaks of 0.005 gallon/hour has not surprisingly lead to the discovery of multiple pre-test failures.