Vapor Monitoring for Underground Storage Tanks

Overview

When properly installed and performed, vapor monitoring (VM) is an acceptable leak detection method for underground storage tanks (USTs) and piping that were installed prior to September 15, 2010 in Virginia (9VAC25-580-160.5). This fact sheet provides a brief overview of how to conduct the method, as well as required recordkeeping.

How does vapor monitoring (VM) work?

- Typically, VM involves using a sensor to measure product vapors in the soil surrounding the underground storage tank (UST) and/or associated piping. Measurements are taken from strategically placed monitoring wells that are designed to capture vapors near the bottom of the UST system. When used correctly, the sensor will detect any unusual increases in the vapor concentration in the monitoring well, which may indicate a release.
    - VM can also be conducted by introducing a tracer compound into the UST system and monitoring for its presence. Read more about "active" (i.e., tracer) monitoring here: EPA 510-K-20-002.
- Vapor monitoring measurements can be taken with a handheld device or with permanently installed sensors.

Will vapor monitoring work for my UST system?

- Vapor monitoring can meet release detection requirements for USTs and piping installed prior to September 15, 2010. *(Note: all pressurized piping systems must also have automatic line leak detectors.)*
- A site assessment is required to determine whether the soil type, groundwater depth and flow direction, background contamination level (e.g., from previous releases), and general geology of the site will support vapor monitoring. This can only be done by a trained professional. All vapor monitoring site assessments performed after January 1, 2018, must be signed by a professional engineer or geologist.
- The vapor monitoring device must be capable of detecting any significant increase in vapor concentration above the background contamination level. Acceptable vapor monitoring devices include any device with a photoionization detector (PID) or any device that has been evaluated and certified by a third party for the substance being monitored. All other devices must be submitted for approval by DEQ.

What are the operational requirements?

- Background vapor concentrations must be determined for each vapor monitoring well by taking at least 20 vapor measurements from each well during the first month. This background data must be used to calculate the vapor concentration for each well which could indicate a possible new release of product (upper tolerance limit or UTL).
    - See DEQ's *Vapor Monitoring UTL Calculation & Release Investigation Workbook* (Microsoft Excel).
    - For detailed instructions on taking background measurements and calculating the UTL for each well, and on investigating and reporting suspected releases, please see Appendix L of the Underground Storage Tank Inspections Manual at https://townhall.virginia.gov/L/ViewGDoc.cfm?gdid=6026.
- Conduct monitoring of each well at least every 30 days. Keep a monthly log including the name of the person taking measurements, the vapor monitoring device used (type and model number), and the location and UTL of each well. For each monthly check, include the date and the measured vapor concentration (ppm) for each well.
    - Any monthly measurement higher than the UTL must be investigated. If it cannot be explained by a non-release cause, you must report a suspected release to DEQ within 24 hours. Contact your DEQ Regional Office to report (https://www.deq.virginia.gov/get-involved/about-us/contact-us). If possible, please submit the Environmental Pollution Report (EPR) form found here via email.
- Annually calibrate (or test according to manufacturer's instructions) the vapor monitoring device.

What records do I need to keep?

- A site assessment for vapor monitoring must be maintained for as long as the method is used.
- At least the previous 12 months of monthly monitoring logs.
- An annual calibration or test of the monitoring device (according to the manufacturer's instructions).
- Written documentation of any maintenance or repairs of release detection equipment must be maintained for at least one year; it is advisable to maintain this documentation for as long as the method is used.

For more information:

- Contact the Office of Spill Response & Remediation at tank@deq.virginia.gov, or contact your regional DEQ Office: https://www.deq.virginia.gov/get-involved/about-us/contact-us