Groundwater Monitoring

When installed and operated properly, groundwater monitoring meets the North Dakota leak detection requirements for underground storage tanks and piping. Groundwater monitoring uses strategically placed monitoring wells in the backfill or soil surrounding the tanks and piping (UST system) to measure for the presence of petroleum in the groundwater which may indicate a release. To discover if leaked product has reached groundwater, these wells must be checked every 30 days by hand or continuously with permanently installed equipment.

How does the groundwater monitoring work?

- Groundwater monitoring involves the use of permanent monitoring wells placed close to the UST system. The wells are checked at least every 30 days for the presence of product that has leaked from the UST system and is floating on the groundwater surface.

- The two main components of a groundwater monitoring system are the monitoring well (typically a well of 2-4 inches in diameter) and the monitoring device.

- Detection devices may be permanently installed in the well for automatic, continuous measurements for leaked product.

- Detection devices are also available in manual form. Manual devices range from a bailer (used to collect a liquid sample for visual inspection) to a device that can be inserted into the well to electronically indicate the presence of leaked product. Manual devices must be used at least once every 30 days.

Will groundwater monitoring work at your site?

Although this type of release detection is allowed in North Dakota, groundwater monitoring is not the best method to detect leaks in UST systems because it only detects leaks after petroleum has impacted the environment.

Before installing a groundwater monitoring system, a site assessment must be performed to determine whether groundwater monitoring is appropriate at the site. A site assessment usually includes at least a determination of the groundwater level, background contamination, stored product type, and soil type. You must maintain a site assessment for as long as groundwater monitoring is used for release detection at your facility. Site assessments completed after April 1, 2018 must be signed by a licensed professional.

The number and placement of groundwater monitoring wells for UST systems is site specific and depends on the size, number and location of the tanks and piping at the site. Generally one well per 20 to 40 feet surrounding tanks and piping is sufficient if the monitoring well is installed in the backfill surrounding the tank system. In all cases the Department should be consulted when determining the correct number and placement of groundwater monitoring wells.

Regulatory Requirements

What are the regulatory requirements for groundwater monitoring?

- Groundwater monitoring can only be used if the stored substance does not easily mix with water and floats on top of water.
- If groundwater monitoring is to be the sole method of leak detection, the groundwater must never be more than 20 feet below the surface, and the soil between the well and the UST system must be sand, gravel or other coarse materials.
- Product detection devices must be able to detect 1/8 inch or less of leaked product on top of the groundwater.
- Monitoring wells must be properly designed and sealed to keep then from becoming contaminated from outside sources. The wells must also be clearly marked and secured.
- Wells should be strategically placed in the UST system backfill so that they can detect a leak as quickly as possible.
- Monitoring must be done at least ***once every 30 days***.
- A written log must be kept documenting the monitoring results.
- At a minimum, the most recent 12 months of monitoring records must be maintained on file.

What are the regulatory requirements for groundwater monitoring?

- All release detection equipment needs to be tested and inspected every year.
    - If you use permanently installed electronic equipment for groundwater monitoring, at a minimum, test the alarm, battery backup and verify the system configuration. For probes and sensors, you must inspect for residual buildup, ensure floats move freely, ensure the shaft is not damaged, ensure cables are free of kinks and breaks, and test alarm operability and communication with controller.
    - All hand-held equipment must be checked for functionality and operability.
    - Keep results for your annual release detection equipment operations test for at least three years.
- Keep results of your 30-day monitoring tests for at least one year. Your monitoring equipment may provide printouts that can be used as records.
- Keep all records of calibration, maintenance, and repair of your release detection equipment for at least one year.
- Keep any schedules of required calibration and maintenance provided by the release detection equipment manufacturer for at least five years from the date of installation.
- Keep all performance claims supplied by the installer, vendor, or manufacturer for at least five years.

What to do if groundwater monitoring detects a release?

- Contact a service technician **immediately** to determine the source of the release.
- Empty the product from the identified leaking tank and/or stop using the grade of fuel that is associated with the identified piping leak.
- **Report the confirmed release to the North Dakota Department of Environmental Quality at 701-328-5166.**