

The North Dakota Underground Storage Tank (UST) Rules require that all UST systems be checked for leaks on at least a monthly basis. Interstitial monitoring is a method of leak detection that can be used on double-walled tanks.

As of January 1, 2009, all new or replacement USTs and piping installed in North Dakota must be double-walled. Double-walled tanks are essentially a tank within a tank. They are designed to prevent releases into the environment by containing fuel in the “interstitial space” between the two tanks if a leak occurs from the inner tank. When the interstitial space is monitored continuously and alarms are attended to as they occur, fuel can be prevented from reaching the environment.

Tank Interstitial Monitoring

Double-walled tanks can be fashioned with both walls made of either steel or fiberglass or with an inner steel tank and an outer containment vessel constructed of fiberglass or polyethylene plastic, generally known as “jacketed” tanks.

Interstitial monitoring detects the presence of liquid in the interstitial space. Double-walled tanks can be designed for continuous electronic monitoring or monthly visual inspection of the interstitial space for signs of leaks.



The bottom of the vertical monitoring pipe on the end of this double-walled steel tank connects to the interstitial space.

Continuous Electronic Monitoring

If a double-walled tank is monitored for leaks using an automatic leak-sensing device, interstitial monitoring is performed using sensors that are connected to an automatic tank gauge (ATG). The ATG continuously monitors for leaks and serves as an alarm console for the sensors. Sensors will trigger a visual or audible alarm at the ATG whenever the sensor detects liquid.

Oftentimes sensors cannot tell the difference between fuel and water and only alert the operator that a liquid is present. Alarms must be investigated to determine the cause.



Above: Sensor for monitoring of double-walled tanks. *Below:* The sensor after being installed. The wires are for reporting back to the automatic tank gauging system.

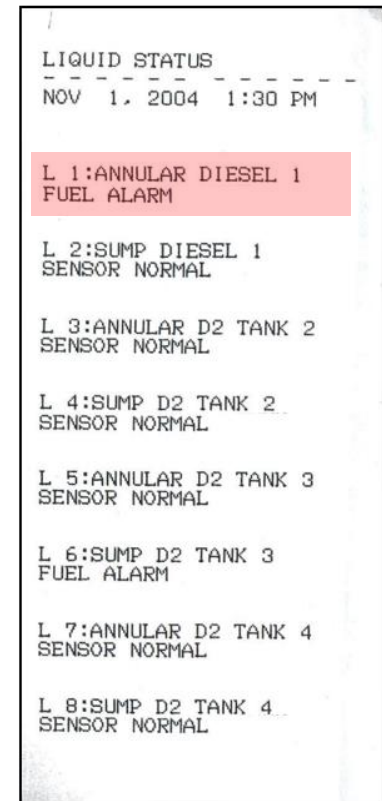


Continuous Electronic Monitoring

Most ATGs or leak detection consoles indicate alarms with audible beeping or a horn or an illuminated red light. Systems with digital displays also describe the alarm (e.g., L1: Fuel Alarm). The sensor location with the sensor identification numbers or label should be posted close to the ATG so it can be quickly determined which part of the tank system is causing the alarm.

If the ATG or leak detection console is in alarm, take the following steps:

- Investigate to determine whether fuel or water has triggered the alarm.
- Contact a service technician immediately to determine the cause of the leak.
- Report confirmed fuel leaks to the North Dakota Department of Environmental Quality at 701.328.5166.



Printout from an automatic tank gauging system showing the status of the liquid sensor in a double-walled tank. L1, L3, L5 and L7 are tank sensors. The others are piping sump sensors.

Visual Monitoring

If a double-walled tank is monitored for leaks using visual monitoring, the operator must manually check the tank's interstitial space every month for fuel or water. The date and results of the visual inspection must be logged or recorded as proof that leak detection is being performed. To find the interstitial access, an operator should look for a round, flat metal cover, usually about a foot in diameter, located in the concrete pad over the top of the tank(s). The cover may be marked with a triangle, or it may have no identifying markings on it. When the metal cover is removed, the operator will find a cap that seals the top of the pipe that leads down into the tanks interstitial space.



Access covers to the tank interstitial spaces are usually flat metal plates about 8 to 12 inches in diameter. They may be marked with a triangle or have no markings at all.

Visual Monitoring

The following steps should be used to visually check the interstitial space of each tank:

- Apply water-detecting paste to the bottom inch of one side of a CLEAN gauge stick.
- Apply fuel-detecting paste to the bottom inch of the opposite side of the stick.
- Insert the gauge stick into the interstitial space until it touches the bottom of the tank interstitial space.
- Leave the stick in the bottom of the interstitial space for the amount of time recommended by the paste manufacturer (usually less than a minute).
- Remove the stick and check to see if the paste has changed color. A color change in either paste indicates the presence of liquid and is evidence of a possible leak.
- If neither paste has changed color, this procedure can be used to check any other double-walled tanks on site without having to re-apply the pastes.
- When all double-walled tanks have been checked, wipe the pastes off the gauge stick.
- Keep a log of the monthly monitoring results.

Tank Interstitial Monitoring Log

The North Dakota Underground Storage Tanks Rules require that you keep a record that the interstitial space of your tank has been checked every month. This is an example of a log to record the results.

The form “[30-Day Interstitial Monitoring For Tanks](#)” to record your interstitial monitoring results is available at the NDDEQ Underground Storage Tank Program website.



30 DAY INTERSTITIAL MONITORING FOR DOUBLE-WALLED TANKS
 NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
 DIVISION OF WASTE MANAGEMENT – UNDERGROUND STORAGE TANK PROGRAM
 SFN XXXX (09-2022)

Telephone: 701-328-5188
 Fax: 701-328-5200
 Email: ndust@nd.gov
 Website: <https://deq.nd.gov/wm>

Interstitial monitoring is a method of detecting leaks in the underground storage tank (UST) systems that are double-walled. Double-walled tanks are essentially a tank within a tank. They are designed to prevent releases into the environment by containing fuel in the “interstitial space” between the two tanks if a leak occurs from the inner tank. You can monitor for leaks in the interstitial space by visually checking a gauge, monitoring with an electronic sensor or manually with a gauge stick.

If a pressure or vacuum gauge is used to monitor the interstitial space, you must check and record the gauge readings at least once every 30-days. A change in the recorded pressure may indicate a leak.

If the double-walled tank is monitored using sensors that are continuously monitoring for leaks, the ATG continuously monitors for leaks and also serves as an alarm console for the sensors. You must print out a copy of the sensor report at least once every 30-days to record that the sensors do not detect liquid in the interstitial space.

If a double-walled tank is monitored for leaks using visual monitoring, the operator must manually check the tank’s interstitial space every 30-days for fuel during a visual inspection. The results of the visual inspection must be logged or recorded as proof that the interstitial space has been checked.

Example Document

Facility Name	Facility Location Address	ND UST Facility ID
---------------	---------------------------	--------------------

Fill in the date, the method of interstitial monitoring, and the results of the 30-day leak check.

- If **manual testing** is performed write the results of the stick reading (i.e., dry or liquid is detected).
- If a **pressure or vacuum gauge** is attached to the interstitial space, write the gauge reading.
- If a **continuous automated system** is used, print a copy of the sensor status on your ATG console.

Date of Inspection		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tank ID	Method of Monitoring												

ND DEQ, Underground Storage Tank Program, 4201 Normandy Street, Bismarck ND 58503



Regulatory Requirements

What are the regulatory requirements for tank interstitial monitoring?

- All release detection equipment needs to be tested and inspected every year.
 - You must inspect probes and sensors for residual build-up, 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 the controller.
 - If you manually check the interstitial space, check your tank gauging stick for operability and serviceability.
- Keep results for your annual release detection system operation tests for at least three years.
- Keep results of your 30-day release detection tests for at least one year.
- 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.

Tank Interstitial Monitoring

What to do if interstitial monitoring indicates a leak?

- Contact a service technician immediately to determine the cause of the leak.
- Report confirmed fuel leaks to the North Dakota Department of Environmental Quality at 701.328.5166.

Interstitial monitoring is the only release detection method that can PREVENT a leak from getting into the soil or groundwater if the operator is paying attention.