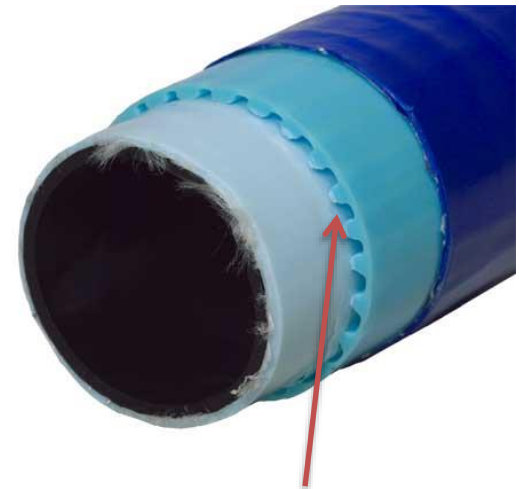


The North Dakota Underground Storage Tank (UST) Rules require that all UST systems be checked for leaks on at least a monthly basis. Interstitial monitoring is a method of leak detection that can be used on double-walled piping systems.

Double-walled piping systems consist of pipes within pipes and are designed to prevent releases into the environment by containing leaked fuel in the “**interstitial space**” created between the two walls of the pipe.



Interstitial Space

## Types of Double-Walled Piping

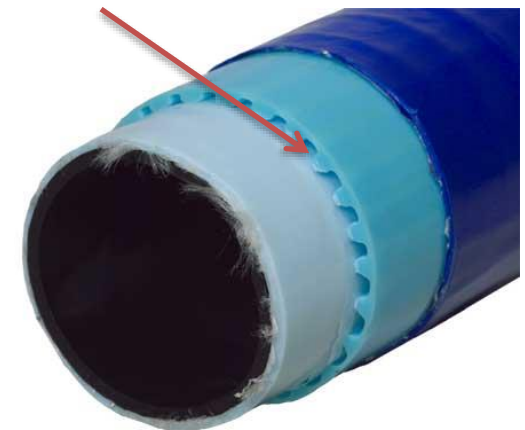
Double-walled piping systems fall into one of two categories:

- **Ducted pipe**, which has a large diameter outer wall and a smaller diameter inner pipe. If flexible piping is used to construct the ducted system, the inner pipe slides inside the outer pipe so the inner pipe can be removed and replaced without excavation.
- **Coaxial pipe**, which has an outer wall that fits snugly over the inner pipe. The two walls of coaxial pipe are manufactured together at the factory and installed as a unit. In some cases, coaxial pipe is installed within a larger diameter duct to permit replacement of the coaxial pipe without excavation.



Ducted Pipe

Interstitial Space



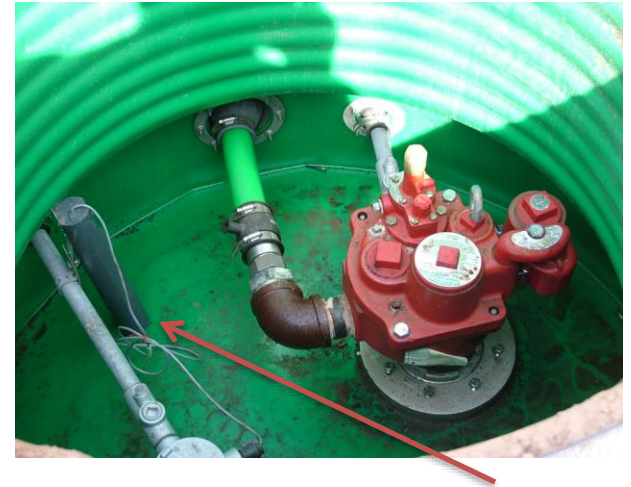
Coaxial Pipe

## ***Piping Sumps***

To be sure that all the fuel-carrying components of the piping system are contained, a double-walled piping system also includes liquid-tight containment “**sumps**” that are located beneath the dispensers, where the piping connects to the pumps at the tank top (turbine), and where piping transitions from one pipe to several. Sumps are open to the primary piping and can collect the product where it can be sensed by a sensor if a leak were to occur. Any liquid, water or fuel, found in the sumps should be considered a problem and needs to be investigated and fixed.

Unlike double-walled tanks that are constructed in a factory under controlled conditions, double-walled piping systems are assembled in the field and are more susceptible to leaks from improperly fitted elbows and other connections.

**Since January 1, 2009, double-walled piping has been required for all new and replacement piping that routinely contains fuel, except for properly sloped suction systems with a check valve at the dispenser.**



A sump with double walled piping. Notice the liquid sensor.

## ***Monitoring for Leaks***

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Monitoring of the space between piping walls must be performed at least once a month in order to alert the operator of a possible leak. Two methods of interstitial monitoring for double-walled piping can be used. They are:

- Monthly visual inspection of the dispenser and/or submersible sumps or,
- Permanent float sensors located in the dispenser or submersible sumps that trigger a visual or audible alarm if fluid is detected. All alarms must be investigated even if past alarms were due to water in the sump.

**The results of both methods of monitoring must be documented or logged once a month as evidence of piping release detection.**

## Monitoring for Leaks

It is very important to note that if your facility uses interstitial monitoring to detect leaks in the piping system, the sumps must be liquid tight and cannot contain fuel or water. Interstitial monitoring of the piping sumps does not work if you continuously have water in your sump or if you are unwilling to immediately correct the water issues when they occur.

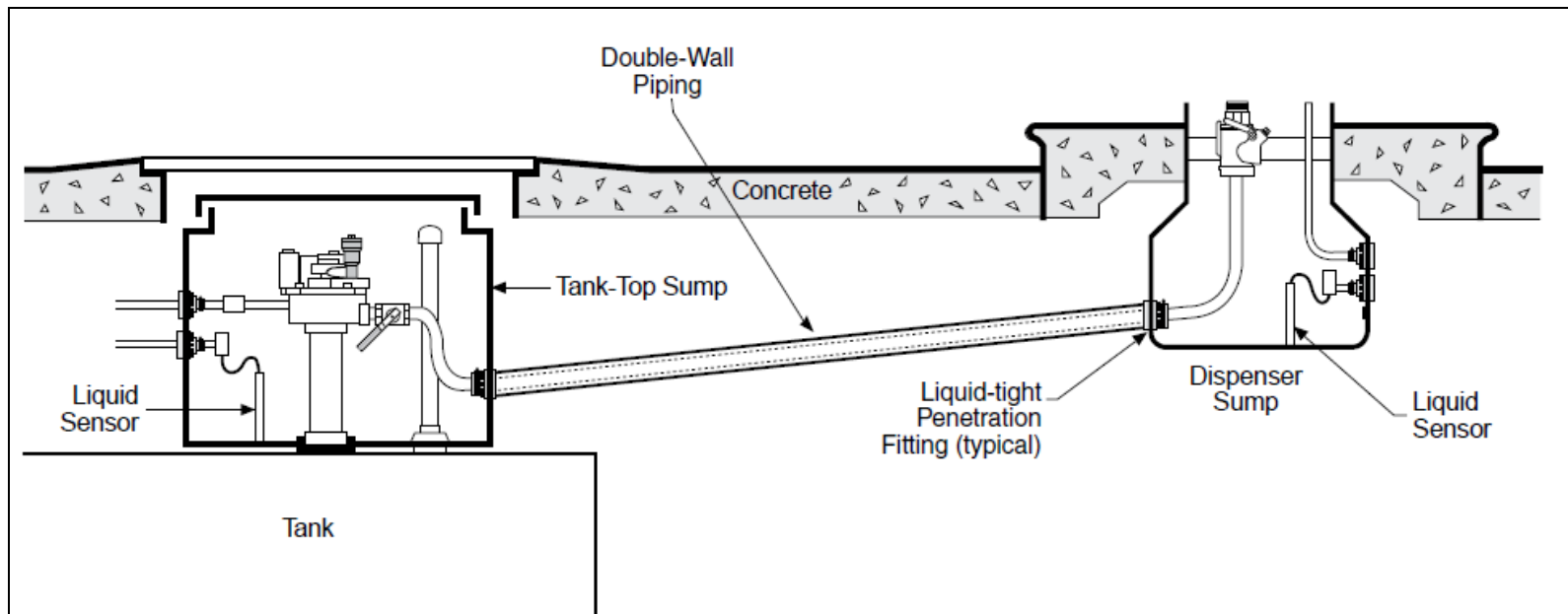


Diagram of a double-walled pressurized piping system. Any fuel leakage that occurs in the piping itself will flow down to the tank-top sump where the liquid sensor will trigger an alarm inside the facility. Leaks from piping components at the tank top are contained in the tank-top sump, while leaks from the dispenser are contained in the dispenser sump.

## ***Visual Inspection of Piping Sump***

If the sumps in your double-walled piping system do not contain electronic alarms or if the alarms are not functional, you can meet the leak detection requirements for piping by visually checking all piping sumps once a month. This includes dispenser sumps. After the sumps have been visually checked, you must document that they have been checked.

Documentation must include the sump's ID, the date, the condition of the sump (is water or fuel visible), and the inspector's initials. You may record the information in a logbook or use a form "[30-Day Visual Inspection Of Piping Sump Record](#)" that is available on the internet at the NDDEQ Underground Storage Tank Operator Training Program. This documentation must then be kept on site for at least 12 months. *For pressurized piping systems, visual monitoring of piping sumps must be used in conjunction with line leak detectors in order to meet the leak detection requirements.*



Opening a sump for visual inspection

# Visual Inspection of Piping Sump



## 30 DAY MONITORING OF PIPING SUMPS

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF WASTE MANAGEMENT – UNDERGROUND STORAGE TANK PROGRAM

SFN 62204 (07-2022)

Telephone: 701-328-5166

Email: [ndust@nd.gov](mailto:ndust@nd.gov)

Fax: 701-328-5200

Website: <https://deq.nd.gov/wm>

Clear Form

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

Fill in the date, if the sump has a sensor and the results of the 30-day leak check. If you are visually checking the sumps, write the results of the check (i.e., dry or if fuel or water is found). If a sump sensor is present in the sump, write that the sump alarm was checked and print a copy of the sensor status on your ATG console. See back side for additional instructions.

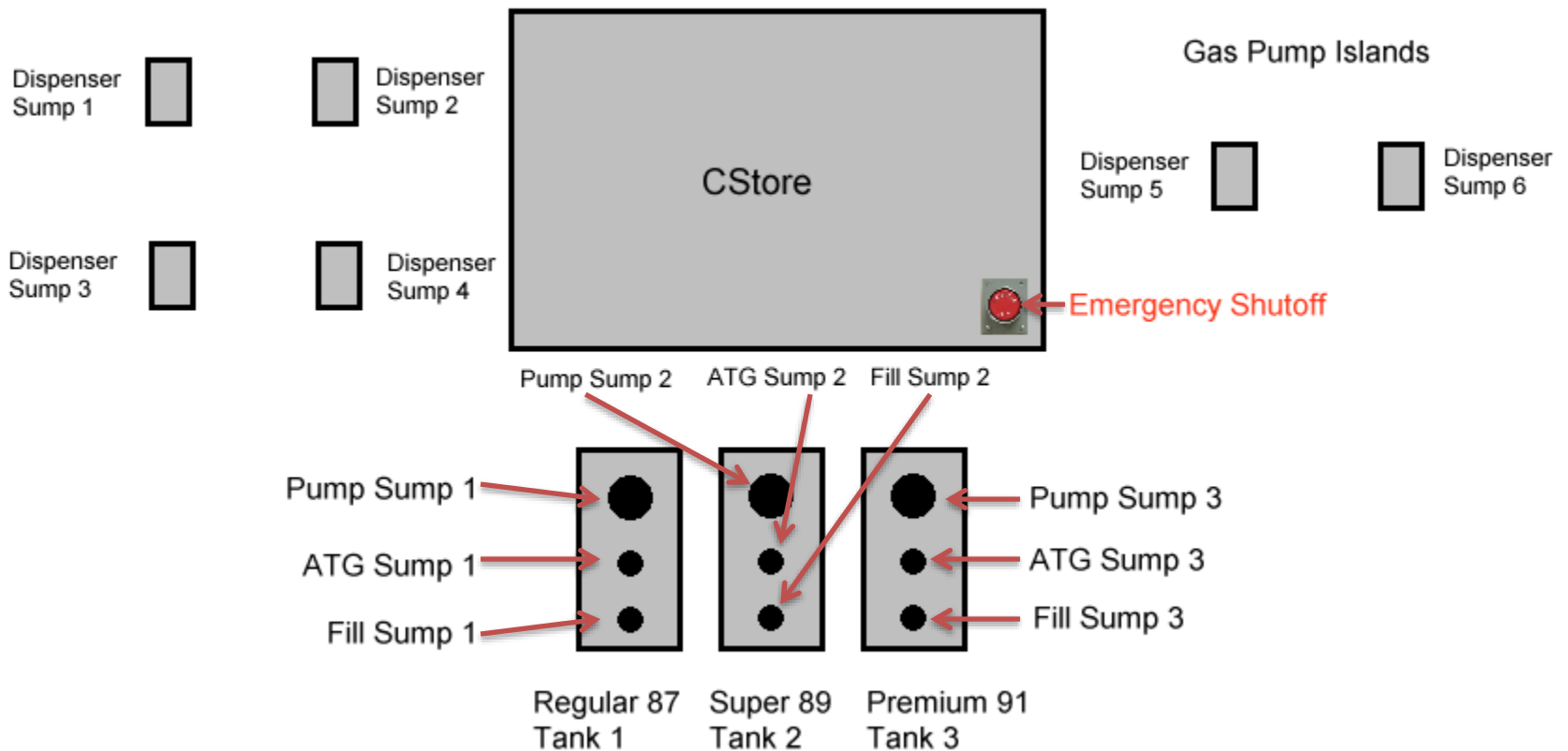
Date of Inspection		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Piping Sump #	Alarm Present (Y/N)												
(Ex. Premium diesel #1, etc.)													

Example Document

## Site Map

All facilities should build a site map that is readily available to clearly identify UST equipment such as all sumps, rectifiers and shutoff switches/breakers for the pump equipment.

### Gas Pump Islands





## Electronic Monitoring of Sumps

Many double-walled piping systems use electronic sensors to monitor sump systems. These sensors work by detecting water or fuel in the sump and send an alarm to a monitoring system such as an automatic tank gauging system if a liquid is detected. The alarms may be audio or visual. It is important to investigate all alarms even if past alarms were the result of groundwater or surface water infiltration into the sump.

North Dakota Underground Storage Tank Rules require you to document that the sumps are being monitored. If your monitoring system prints out a report showing that the sumps are being monitored, you must keep a copy of this printout at your facility for at least 12 months. If your monitoring system **does not** print out a leak detection report, you must record the piping leak report manually. Documentation must include the sump's ID, the date, the status of the sensor, and the inspector's initials. You may record the information in a logbook or use the form "[30-Day Piping Interstitial Monitoring Record](#)" that is available on the internet at the NDDEQ Underground Storage Tank Program website. This documentation must then be kept on site for at least 12 months.

```
LIQUID STATUS
-----
NOV 1, 2004 1:30 PM

L 1:ANNULAR DIESEL 1
SENSOR NORMAL

L 2:SUMP DIESEL 1
SENSOR NORMAL

L 3:ANNULAR D2 TANK 2
SENSOR NORMAL

L 4:SUMP D2 TANK 2
FUEL ALARM

L 5:ANNULAR D2 TANK 3
SENSOR NORMAL

L 6:SUMP D2 TANK 3
FUEL ALARM

L 7:ANNULAR D2 TANK 4
SENSOR NORMAL

L 8:SUMP D2 TANK 4
FUEL ALARM
```

Printout from an automatic tank gauging system showing the status of sump sensors in both tanks and piping. Notice the fuel alarm in L4, L6, and L8. These indicate that sensors have detected liquid in those sumps.

# Electronic Monitoring of Sumps



## 30 DAY MONITORING OF PIPING SUMPS

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF WASTE MANAGEMENT – UNDERGROUND STORAGE TANK PROGRAM

SFN 62204 (07-2022)

Telephone: 701-328-5166

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Clear Form

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

Fill in the date, if the sump has a sensor and the results of the 30-day leak check. If you are visually checking the sumps, write the results of the check (i.e., dry or if fuel or water is found). If a sump sensor is present in the sump, write that the sump alarm was checked and print a copy of the sensor status on your ATG console. See back side for additional instructions.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Date of Inspection													
Piping Sump ID (Ex. Premium diesel #1, etc.)	Sump has sensor (Y/N)												

Example Document

## ***Pressurized Piping and Interstitial Monitoring***

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Many piping systems in North Dakota are pressurized. Because the pumps operate under positive pressure, even large leaks in the piping do not affect the operation of the fuel dispensing system, and without leak detection would go unnoticed. North Dakota UST rules require two types of leak detection on pressurized piping:

- A mechanism or method to detect a “large” leak (3 gallons per hour); ***and***
- A mechanism or method to detect a “small” leak (0.2 gallon per hour leak test every month OR 0.1 gallon per hour leak test every year).

In many piping systems, big and small leaks are detected using line leak detectors. The large 3 gph leaks are detected using mechanical or electronic line leak detectors. The small leaks are detected using electronic line leak detectors or annual piping tightness tests. However, interstitial monitoring of the piping system can satisfy the UST leak detection requirements for a “large” leak as well as a “small” leak in a system called a “continuously monitored system” without the need to use a line leak detector. These systems have special requirements.

## ***Pressurized Piping Systems and Continuously Monitored Sump Systems***

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If a facility allows pumping at the dispenser when an attendant is not present (stores that close at night or cardtroll sites) and use a continuously monitored system that does not shut down or reduce the flow of fuel to the pump, an alarm system must be set up so that a facility operator would be notified if a fuel alarm is triggered by the sump sensor. Quite often an autodialer is set up to telephone a specified number and alert the operator when an alarm has been triggered.

**All alarms must be investigated immediately.**

## ***Regulatory Requirements***

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### **How often must you inspect the piping sumps?**

If your piping sumps contain electronic sensors to monitor for fuel and water, no later than April 1, 2021, you must inspect the sumps every year as part of the walkthrough inspection. It is assumed that the electronic sensors are properly placed in the sump and are continuously monitoring for leaks.

If your piping sumps do not contain electronic sensors, you must visually inspect the sumps every month to check for leaks, even during the winter months.

## Regulatory Requirements

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### What are the regulatory requirements for interstitial monitoring of piping?

- No later than April 1, 2021, you must begin testing all **containment sumps** used for piping interstitial monitoring every three years for liquid tightness or use a double-walled containment sump with periodic (yearly) interstitial monitoring. This includes dispenser sumps. Keep results of these tests for at least three years.
- If your piping sumps contain sump alarms and interstitial monitoring is used as a release detection method for the piping system, no later than April 1, 2021, you must begin performing periodic (yearly) walkthrough inspections. Keep the results of these inspections for one year. All tank and piping systems installed after January 1, 2009 are required to use interstitial monitoring as a form of leak detection for both tanks and piping.
- If your piping sumps do not contain sump alarms and interstitial monitoring is used as a release detection method for the piping system, you must visually inspect the sumps every 30 days. Keep the results of these inspections for one year. All tank and piping systems installed after January 1, 2009 are required to use interstitial monitoring as a form of leak detection for both tanks and piping.
- All **release detection equipment** needs to be tested and inspected every year.
  - No later than April 1, 2021, 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. Keep the results of these tests for at least **one year**.