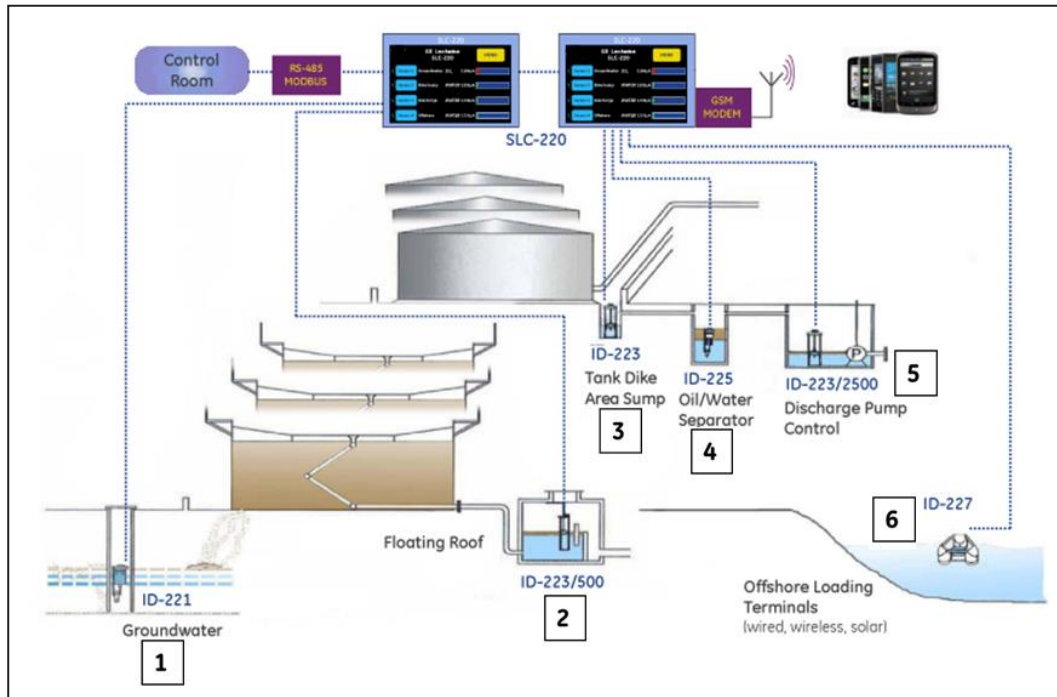




## Case Study

### ABOVE GROUND OIL STORAGE TANKS

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Leakwise Oil Spill and Leak Detection systems are installed in many oil/fuel storage facilities all over the world. The systems are being used in a variety of applications to address health and safety directives, environmental regulations and economic necessity.

The figure above shows some areas where Leakwise technology is being used.

### 1. Groundwater Monitoring

Even sophisticated tank gauging systems cannot detect small leaks of oil or fuel from large tanks. Current health standards allow drinking water to contain less than 1 ppm of hydrocarbons. This means that an undetected leak of 1 liter/gallon of hydrocarbons can contaminate more than 1 million liter/gallons of ground water. Managers of contaminating facilities risk personal prosecution, huge remediation costs, severe fines, adverse publicity, and potential fire hazard. An ID-221 Leakwise Oil Sheen Detector installed in a monitoring well near the tank will give a reliable warning on hydrocarbon seepage into the ground water much earlier than any manual sampling.



Groundwater Monitoring

### 2. Floating Roof Drainage Pipe Monitoring

Storm water accumulated on a storage tank's concave roof may affect its floatation, making it necessary to drain the water. This is usually done through a flexible pipe running from the floating roof down through the inside of the tank, with an outlet above ground near the tank base. This solution has some drawbacks:

- Product from the tank can penetrate the flexible pipe through pinholes or cracks and be discharged through the water drainage system unnoticed.
- Product from the tank can occasionally run over the roof through the roof's seal and exit through the water drainage line.
- In many areas, local regulations require that all roof water be treated.

Monitoring the drain exit of an individual tank with an ID-223 Sensor, installed in a retention tank or separator, is the most reliable way to detect leaks and inform the management. This way it is clear which tank leaks. Monitoring only at the final water treatment or discharge is not informative for indicating which tank leaks and needs to be repaired.

### 3. Tank Rampart Area Monitoring

Drainage channels and sumps around storage tanks collect and drain storm water. However, they also collect any hydrocarbons from leaking pipes, valves, or pumps. Also, accidental tank overflow is contained in the bunded area. These sumps, which can be wet or dry, should be continuously monitored for the following reasons:

- **Health and Safety:** Undetected buildup of flammable liquids in the bund area risks harmful vapors and possible fire or explosion.
- **Environmental:** Leaks or spills should be detected before they are released from the contained area.
- **Economic:** Product loss is a direct cost against the business. However, an additional cost can be incurred when clean storm water from the bunded area is sent for treatment. Having the ability to monitor for oil sheens lets the operator send only oily water through the treatment process, potentially saving money on the size of the treatment area and treatment costs.

A ID-223 Oil Sheen Detector installed in the collecting sump will continuously monitor its water outlet. If water is detected, it can be diverted into retention tanks or directly discharged into the sea, a river, or public drainage. If oily water is detected, an alarm will be set off and the ID-223 Detector will close the water outlet valve. The oily water could then be manually or automatically diverted into an API separator or other oily water treatment system.

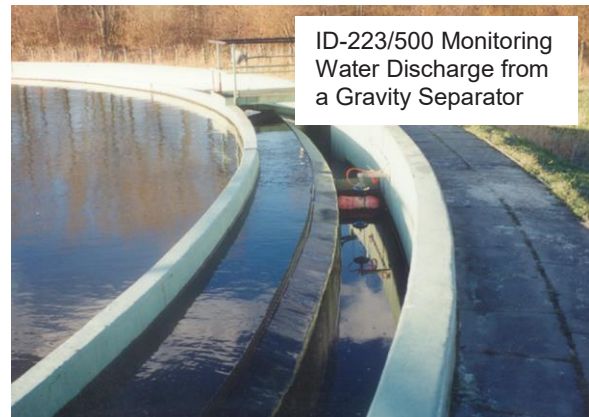


### 4. Monitoring in Oil / Water Separators

In many tank storage facilities, water is collected and then sent to a separator or interceptor, where oil is separated and water is discharged directly to the sea, river or public drainage. In other cases, water from the tank area could be treated in an API separator. An ID-225 Oil Layer Thickness Monitor will continuously monitor the thickness of the accumulated oil layer and inform the operator when to skim the oil. Oil skimmers can be automatically controlled by the ID-225 Sensor, starting the skimming at a user-set oil thickness, and stopping before water is removed with the oil. This can result in considerable savings in treatment and disposal costs.

### 5. Water Treatment Discharge Monitoring

Installing an ID-223 sensor in the final retention tank will continuously monitor the discharged water and ensure treatment is running smoothly. A spill condition will be detected and the operator notified, or the system can automatically stop the discharge and contain the spill, allowing the operator time to take appropriate action.



## 6. Offshore Terminal Monitoring

ID-227 Wave Rider Detection Systems are installed at tanker terminals to detect oil spills during loading / offloading at loading docks or near Single Point Mooring Buoys. The Leakwise Wave Rider can be self-contained with solar panel charging, PTP Radio or GSM communications, or it can be wired and powered by a local power source. This enables operators to react when unnoticed oil spills occur during product transfer, especially at night.

