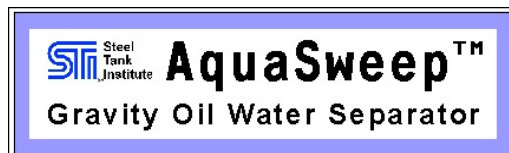


AQUASWEEP™

JUNE 2009



INSTALLATION INSTRUCTIONS FOR AQUASWEEP™ UNDERGROUND OIL WATER SEPARATORS

PREFACE

- i. Install the AquaSweep™ Oil Water Separator using personnel who have knowledge and experience in procedures involved with proper and safe installation of such a system. To avoid damage to the unit, use skilled, professional tank installers.
- ii. Consult separator manufacturer's installation instructions for other specific instructions for the tank technology utilized.
- iii. Separator must be installed within one year of delivery from separator manufacturer. If separator is not installed within this time period, contact separator manufacturer to recertify the separator.

1.0 EXCAVATION AND BEDDING

- 1.1 The bottom of the excavation shall be covered with a minimum of 12 inches (305 mm) of bedding, suitably graded and leveled. Bedding and backfill material surrounding the separator, to a width and depth of 12 inches (305 mm) all around the separator, shall be clean material.
- 1.2 Where anchoring by means of a concrete pad, the separator shall not be placed directly on the pad. Bedding material at least 6 inches (152.4 mm) deep must be spread evenly over the dimensions of the pad to separate the separator from the pad.
- 1.3 Bedding and backfill material shall consist of homogenous pea gravel, crushed stone, clean sand or natural earthen materials. Crushed stone, clean sand and natural earthen materials shall be capable of passing 100% through a 1/2 inch (13 mm) sieve and no more than 12% by dry weight through a #200 sieve (0.0029 inch (0.0754 mm)). Pea gravel shall be no larger than 3/4-inch (19 mm). The materials shall be free of all foreign materials, such as but not limited to, bricks, metals, concrete and plastics.
- 1.4 The backfill material may be from the separator site if it meets this description, or it may be delivered to the site from another source.
- 1.5 Sand or natural earthen materials used as backfill shall be placed into the excavation in 12-18 inch (305-458 mm) vertical lifts, compacted after each lift, at least 60% up the vertical height of the separator.
- 1.6 If earthen material from the site, or other earthen material, is to be used as bedding or backfill material, a minimum of four 1 cubic foot (0.028 cubic meter) samples shall be taken from different locations which are representative of the backfill material and the site. Samples shall be sieved to determine if the material complies with this specification.
- 1.7 In a tidal area, the separator "bedding" material shall be crushed stone or pea gravel. Sand and natural earthen material may be used only if measures are taken to prevent washout of material during the design life of the system.

2.0 AIR TEST AT JOB SITE

- 2.1 Temporary plugs and thread protectors installed by the manufacturer shall be removed. Apply compatible, non-hardening pipe sealant to internal bushing threads. Permanent metal plugs shall be installed at all unused openings.

- 2.2 When nylon bushings are installed in separators, they shall not be removed from any unused openings. Plugs used to temporarily seal the separator for the above ground air test, but later removed for pipe installation, shall not be over tightened. Do not cross thread or damage the nylon bushings when replacing plugs or installing required separator piping.
- 2.3 Test pressure shall be maintained at, without exceeding, 5 psig (34.47 kPa) while a soap solution is applied to the area of pipe connections and welds.
- 2.4 Dual wall separators shall require different air pressure testing procedures. Do not connect a high pressure air line directly to the interstitial monitoring port. A factory applied vacuum within the interstitial space can be used in lieu of, or in addition to, the air test procedure. Consult separator fabricator for air test recommendations. Do not apply a vacuum to the primary separator or a single wall separator. PEI/RP 100 also provides guidelines.
- 2.5 Take necessary safety precautions during air tests. Do not leave separators unattended. Avoid standing at the head of the separator, especially while applying air pressure. Use an air-pressure relief valve.

3.0 COATING INSPECTION

- 3.1 Before placing the separator in the excavation, all dirt clods and similar foreign matter shall be cleaned from the separator, and areas of coating damage shall be repaired per coating manufacturer's recommendations.
- 3.2 Clean damaged coating areas through removal of surface rust, dirt, contaminants and disbanded coating prior to application of touch-up coating (see sti-P3[®], ACT-100[®], ACT-100-U[®], Permatank[®] or separator manufacturer's instructions for additional guidance).

4.0 SEPARATOR HANDLING

- 4.1 Equipment to lift the separator shall be of adequate size to lift and lower the separator without dragging or dropping to ensure there is no damage to the separator or the coating.
- 4.2 Separators shall be carefully lifted and lowered by use of cables or chains of adequate length attached to the lifting lugs provided. A spreader bar shall be used where necessary. Under no circumstances shall chains or slings be used around the separator shell.

5.0 CATHODIC PROTECTION SYSTEM - sti-P3[®] SEPARATORS ONLY

- 5.1 sti-P3[®] separators may be equipped with either zinc or magnesium anodes. Whereas magnesium anodes are designed only for installation in soil resistivities of 2000 ohms-cm or greater, zinc anodes are effective in all soil resistivities.
- 5.2 After an sti-P₃[®] separator has been placed in the excavation, if anode is connected by a lead wire, attachment to the separator shall be checked to assure this connection has not been damaged. Where damaged, the connection must be re-established in strict accordance with this specification.
- 5.3 To assure immediate operation of cathodic protection system, each anode shall be thoroughly saturated with water at time of backfill operations.
- 5.4 Each separator is provided with a separator structure lead. This lead must be brought to an easily accessible location at finish grade for future monitoring of the cathodic protection system.
 - 5.4.1 Another option is to use a buried permanent reference cell, such as a PP4.
- 5.5 Select a terminal location on a pipe near grade that will be accessible through a grade manhole upon completion of installation.
- 5.6 Loosen the black nylon pipe lashing by releasing the locking tab.
- 5.7 Secure the structure lead terminal (PP2[®]) to the pipe by tightening the black nylon pipe lashing. The lead wire terminations shall remain sealed.

- 5.8 Route wire to avoid strain or breakage during backfill. Do not cover PP2® terminal with backfill material.
- 5.9 When the installation is completed, monitor the separator to assure proper installation and ensuing cathodic protection of the separator. Before pouring concrete or asphalt pad atop separator, a separator to soil potential reading with a high impedance voltmeter and copper/copper sulfate reference electrode must be taken. Reference electrode shall be placed in moist soil directly above the separator. A minimum reading of -850 millivolts should be obtained to indicate that the separator anodes are activated. Record reading on installer information card and other permanent files.

6.0 ANCHORING

- 6.1 High water tables or partially flooded excavation sites exert significant buoyant forces on separators. Buoyant forces are partially resisted by the weight of the separator, the backfill and the pavement atop the separator. Additional buoyant restraint, when required, shall be obtained by using properly designed hold-down straps in conjunction with concrete hold-down slabs or deadman anchors. The use of steel cable and/or round bar as hold-down straps on the separator is prohibited.
- 6.2 If a metallic hold-down strap is used, a pad of inert insulating di-electric material must be used to insulate the hold-down strap from the separator. The separating pad shall be wider than the hold-down straps, which will prevent direct contact between the straps and the separator shell. This pad is not required if the hold-down strap is fabricated from non-conductive material.

7.0 BACKFILLING

- 7.1 Homogeneous backfill similar to bedding material shall be placed carefully around the entire separator to create a uniform homogeneous environment. Avoid damage to coating especially where tamping is required.
- 7.2 Installing and tamping backfill along the bottom sides of the separator shall ensure that the separator is fully and evenly supported around the bottom quadrant.

8.0 ELECTRICAL ISOLATION

- 8.1 All openings shall be isolated where electrical accessories will be installed such as submersible pump, monitoring equipment and all other grounded electrical devices.
- 8.2 Prior to backfilling to top of separator, all openings shall be visually inspected to assure that the di-electric isolation (nylon bushings or flange gaskets), where furnished, remains in place. Where flanged openings have been used, isolation of the flange gaskets shall be confirmed with a continuity tester. Contact with the separator shall be made with the inside of the separator, or possibly at the lift lug, if steel is exposed, prior to application of the lift lug cover. No current shall pass through the factory installed flange gaskets. Isolation of the fittings is required to assure separator integrity.
- 8.3 If the separator is to be installed near an impressed current system, the effect of the system must be considered on the separator. The corrosion consultant must consider including the separator into the design of the impressed current system.

9.0 PIPING AND ATTACHMENTS

- 9.1 Install all permanent piping and fittings using compatible, non-hardening thread sealant material.
- 9.2 The AquaSweep™ Oil Water Separator is signed for influents using gravity flow only. It is not designed for use with influents that are pumped into the unit.

- 9.3 Connect the inlet and outlet piping to the connections provided on the AquaSweep™ Oil Water Separator . Ensure all isolation flanges are installed properly, as required by the tank technology.
- 9.4 Slope the inlet piping a minimum 1/8-inch per foot (0.3175 cm/m) towards the unit. The outlet piping may either be equipped with a pump or the piping must be sloped a minimum 1/8-inch per foot (0.3175 cm/m) away from the separator.
- 9.5 Provide a means of flow shut-off (upstream and downstream) through the separator for control of emergency situations and to facilitate periodic maintenance. These valves need to be accessible at all times.
- 9.6 For maximum performance and minimum maintenance, limit or prevent debris such as sand, gravel, leaves, wood, etc. from entering the separator. This can be accomplished by using an interceptor or collection tank with an easily accessible trap for large debris installed upstream of the AquaSweep™ Oil Water Separator.
- 9.7 Install minimum 1 inch vents on the inlet, outlet, manways and the separator in accordance with federal, state, and local codes.
- 9.8 Install the Oil Water Separator control package per manufacturer's instructions. The control unit inside the separator must be accessible at all times. The control panel must be placed where an attendant can physically see and hear the alarms. The location of the control panel can be inside or outside, but must remain within 900 feet (274.3 m) of the control stem.
- 9.9 Install manway extensions and pump out piping if required. The manways and pump out piping must be accessible at all time.
- 9.10 DO NOT WELD ON THE SEPARATOR, MODIFY OR PENETRATE THE SEPARATOR STRUCTURE IN ANY WAY WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE SEPARATOR MANUFACTURER.

10.0 FINAL AIR TEST

- 10.1 Where air or hydrostatic testing is required after installation, the pressure applied shall not be in excess of 5 pounds per-square-inch (34.5 kPa) as measured at the top of the separator. A soap solution shall be applied around pipe connectors while air test is being performed.

11.0 ELECTRICAL CONTINUITY TEST

- 11.1 Contact between the steel separator and all other structures such as external and internal piping, pumps, valves, gauge and monitoring equipment, and grounding systems, will nullify the cathodic protection design. Prior to backfill, a simple continuity test between the separator lead wire and each connected system will verify the electrical isolation. Continuity shall not be present. After backfill, continuity can be checked on an sti-P3® separator with a high impedance voltmeter by fixing a copper/copper sulfate reference cell in the soil and contacting all structures with the other voltmeter lead wire. Do not move the reference cell. Potential differences between the separator to soil and all other structures to soil must exceed 10 millivolts to verify electrical isolation.

12.0 FINAL BACKFILL

- 12.1 Homogeneous backfill shall be deposited carefully around the separator and to a depth of at least one foot (305mm) over the separator. (See state or local codes for minimum depth of cover required).

INSTALLATION INSTRUCTIONS FOR AQUASWEEP™ ABOVEGROUND OIL WATER SEPARATORS

READ ALL INSTRUCTIONS BEFORE INSTALLATION

PREFACE

- i. Install the AquaSweep™ Oil Water Separator using personnel who have knowledge and experience in procedures involved with proper and safe installation of such a system. To avoid damage to the unit, use skilled, professional tank installers.
- ii. Consult tank manufacturer's installation instructions for other specific instructions for the tank technology utilized.

1.0 SEPARATOR SITE EVALUATION AND PREPARATION PRIOR TO INSTALLATION

- 1.1 The foundation must be designed to support the separator plus 100% of its contents when full. The foundation design shall also take into account the type of support that is being used and the point load associated with that support. The foundation may be constructed using concrete, asphalt, gravel or other stable material and must include provisions in its design to prevent separator movement. The foundation should include any provisions necessary for seismic design.
The foundation design must also include provision for draining surface water away from the separator.
- 1.2 For separator installations without cathodic corrosion protection, the separator should be grounded in accordance with applicable electrical and fire code standards.
- 1.3 Where the steel separator body is in contact with the earth, use a zinc grounding rod. Do not use a copper grounding rod.
- 1.4 Where the separator body is in contact with the earth or foundation, it should be protected from external corrosion. For external corrosion protection using cathodic corrosion protection, consult applicable standards (i.e., National Association of Corrosion Engineers) to provide the separator with appropriate protection from lightning without interference with the corrosion protection. Refer to STI R893-89, "Recommended Practice for External Corrosion Protection of Shop Fabricated Aboveground Storage Separator Floors."
- 1.5 Separators located in areas subject to flooding must be protected against floatation.
- 1.6 Aboveground separators should not be located above underground utilities or directly beneath overhead power lines.
- 1.7 The separator shall be protected from vandalism and accidental damage in accordance with all applicable codes, i.e., NFPA 30, NFPA 30A, UFC, etc.

2.0 SEPARATOR HANDLING

- 2.1 Prior to installation, inspect the exterior and interior of the AquaSweep™ Oil Water Separator carefully. Insure there has been no damage to the coating or to interior components of the system. Repair coating per coating manufacturer's recommendations.
- 2.2 Equipment for handling the separator shall be of adequate size to lift and position the separator. **DO NOT DROP OR DRAG THE SEPARATOR.**
- 2.3 Separators shall be carefully handled using cables or chains of adequate length (with spreader bars, if necessary) and size. Attach to the separator using the lifting lugs provided. Care should be taken that the angle between the two cables, at the lift point, shall be no greater than 60 degrees.
- 2.4 **DO NOT HANDLE OR MOVE THE SEPARATOR UNLESS IT IS EMPTY.**
- 2.5 This is a stationary separator. Do not use this separator for transport of any product.

3.0 TESTING

3.1 GENERAL REQUIREMENTS

- 3.1.1 An on-site air test of the separator may be required by local authorities to ensure no damage has occurred in shipping and handling. All testing shall be done as described below.
- 3.1.2 DO NOT APPLY A VACUUM TO THE PRIMARY TANK OF A DOUBLE-WALL TANK OR TO A SINGLE-WALL TANK.
- 3.1.3 Vacuum monitored double wall separators are shipped from the factory manufacturer with a vacuum drawn on the space between the walls. Read and record the vacuum pressure. If the vacuum gauge reading is less than 12 inches Hg (40.5 kPa), contact the original separator manufacturer.

3.2 AIR PRESSURE TEST PROCEDURE FOR SEPARATORS

- 3.2.1 If the separator is equipped with a long-bolt manway for emergency venting, do not remove the long-bolts from the long-bolt manway. Instead, long-bolt manways must be secured with C-clamps of appropriate size and strength to hold the vent cover in the sealed position to maintain the separator pressures required. If the separator is equipped with standard emergency vents, remove emergency vents and cap openings to hold separator pressure as required.

NOTE: Use only calibrated air pressure gauges with a 0-15 psig (0-103 kPa) dial span. The regulated air supply test pressure used for this test should be as follows:

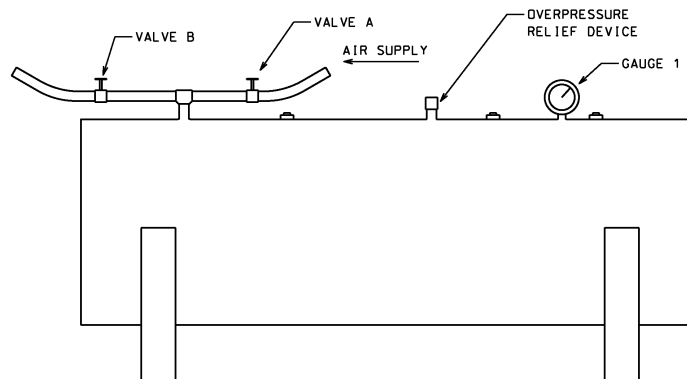
- a. **Horizontal cylindrical separators** - Not less than 3 psig (20.7 kPa) nor more than 5 psig (34.5 kPa). Set Pressure relief valve in test air supply line at 5.5 psi (38 kPa).
- b. **Rectangular separators** - Not more than 3 psig (20.7 kPa). Set pressure relief valve in test air supply line at 3 psig (20.7 kPa).

CAUTION: Do not leave pressurized separator unattended when pressure line/air line is connected. Do not stand in front of separator heads or fittings when pressurizing separator.

Pressurizing of large separators may result in the bulging of the sides of rectangular separators, and bulging of the heads and ends of cylindrical separators. Should visible bulging occur or deformation appears severe, immediately relieve the pressure.

3.2.2 SINGLE-WALL SEPARATOR PRESSURIZING PROCEDURE

- 3.2.2.1 Install test piping as shown in Figure 3.2.2.1. Temporarily plug, cap or seal off remaining separator openings to hold pressure.
- 3.2.2.2 Close valves A and B.

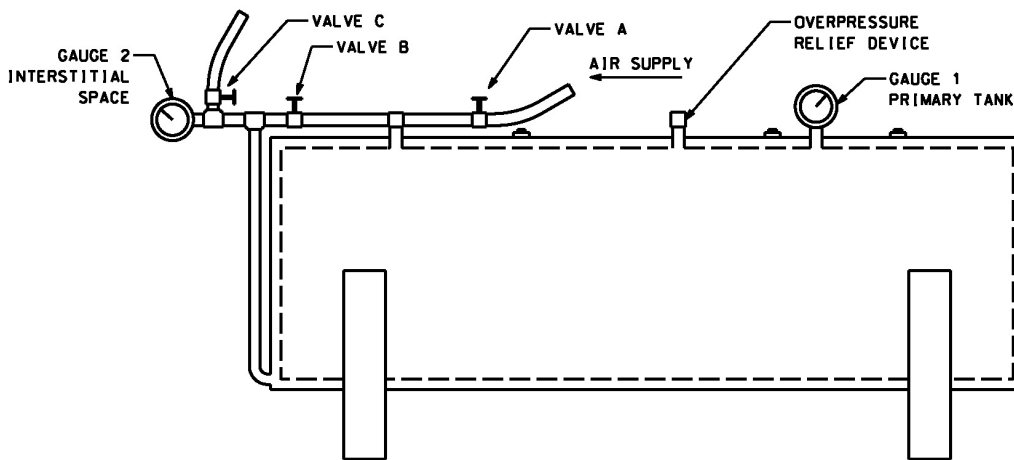


**FIGURE 3.2.2.1
SINGLE WALL TANK**

- 3.2.2.3 Connect regulated test air supply line to test piping as shown in Figure 3.2.2.1.
- 3.2.2.4 Slowly open valve A to pressurize the separator. Pressure gauge 1 should indicate test air pressure given in paragraph 3.2.1 above.
- 3.2.2.5 Close valve A. Disconnect the regulated test air supply line from the test piping.
- 3.2.2.6 Proceed to paragraph 3.2.4 "Detection of Leaks" below.

3.2.3 DOUBLE-WALL SEPARATOR PRESSURIZING PROCEDURE

- 3.2.3.1 The following air pressure testing does not apply to double-wall separators equipped with interstitial vacuum monitoring systems. (In lieu of the air pressure test, the separator may be shipped from the factory with a vacuum in the separator interstice. Read and record the vacuum pressure. If the vacuum pressure, gauge reading is less than 12 inches Hg (40.5 kPa) contact the separator manufacturer.
- 3.2.3.2 Install test piping as shown in Figure 3.2.3.2. Temporarily plug, cap or seal off remaining separator openings to hold pressure.
- 3.2.3.3 Close valves A and B. Open valve C.



**FIGURE 3.2.3.2
DOUBLE WALL TANK**

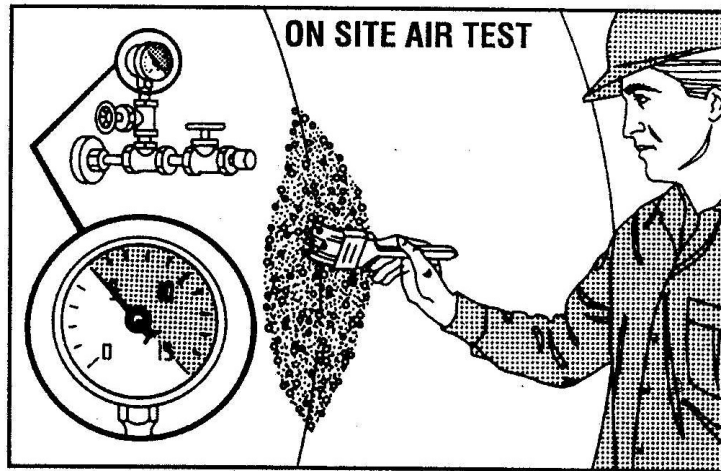
- 3.2.3.4 Connect the regulated test air supply line to the test piping as shown in Figure 3.2.3.2.
- 3.2.3.5 Slowly open valve A to pressurize the primary tank. Pressure gauge 1 should indicate the test air pressure given in paragraph 3.2.1 above.
- 3.2.3.6 Close valve A. Disconnect the regulated test air supply line from the test piping.
- 3.2.3.7 Monitor the test pressure in primary tank for 1 hour minimum. A steady drop in pressure reading for gauge 1 indicates there may be a leak in the primary tank. Check the fittings, the gauge, and then retest. If the problem persists, contact the separator manufacturer.
- 3.2.3.8 If no leaks are found, close valve C and slowly open valve B to pressurize the interstitial space between the double walls of the separator. Pressure gauge 1 will indicate a slight drop in test pressure when valve B is opened, but should hold steady at the lower pressure. If the test pressure drops below the minimum requirements, close valve B, reconnect air supply line and slowly open valve A to increase pressure in the primary tank. When the required pressure is indicated on gauge 1, close valve A and disconnect the test air supply line. Open valve B to equalize the pressure in the primary tank and the interstitial space. Gauge 1 and gauge 2 should have the same pressure reading.

WARNING: Do not apply air pressure to the interstitial space between the walls of a double wall separator without air pressure in the primary tank. Do not apply air pressure to the interstitial space that is higher than the air pressure in the primary tank. Damage to the separator may result.

- 3.2.3.9 Close valve B. Hold the test pressure in the interstitial space for 1 hour minimum. A steady drop in pressure gauge 2 indicates there may be a leak in the interstitial space. Check the fittings, the gauges, and then retest. If the problem persists, contact the separator manufacturer.
- 3.2.3.10 Proceed to paragraph 3.2.4 "Detection of Leaks" below.

3.2.4 DETECTION OF LEAKS

- 3.2.4.1 Immediately apply leak test solution to separator exterior surfaces, welds, fittings, etc. Check for leaks. No leaks are allowed. If leaks are found, notify the separator manufacturer. If no leaks are found, testing of the separator is complete.



- 3.2.4.2 For single-wall separator, open valve B, then slowly open valve A to release the test air pressure. For double-wall separator, open valve C, then slowly open valve B to release the test air pressure.
- 3.2.4.3 With separator depressurized, remove the test piping, temporary plugs, caps and seals. Reinstall the emergency relief vents, etc. which were removed in paragraph 3.2.1 above. If separator is equipped with an emergency vent long-bolt manway, disconnect the C-clamps which were installed in paragraph 3.2.1 above. **WARNING:** Emergency relief vents and long-bolt manways must be operable to prevent causing separator failure by over-pressurization.

4.0 SEPARATOR PIPING AND ACCESSORIES

- 4.1 Install all permanent piping and fittings using compatible, non-hardening thread sealant material.
- 4.2 The AquaSweep™ Oil Water Separator is signed for influents using gravity flow only. It is not designed for use with influents that are pumped into the unit.
- 4.3 Connect the inlet and outlet piping to the connections provided on the AquaSweep™ Oil Water Separator separator.
- 4.4 Slope the inlet piping a minimum 1/8-inch per foot (0.3175 cm/m) towards the uni. The outlet piping may be either equipped with a pump or the piping must be sloped a minimum 1/8-inch per foot (0.3175 cm/m) away from the separator unit.

- 4.5 Install manway extensions and pump out piping if required. The manways and pump out piping must be accessible at all time
- 4.6 Provide a means of flow shut-off (upstream and downstream) through the separator for control of emergency situations and to facilitate periodic maintenance by installing valves. These valves need to be accessible at all times.
- 4.7 For maximum performance and minimum maintenance, limit or prevent debris such as sand, gravel, leaves, wood, etc. from entering the separator. This can be accomplished by using an interceptor or collection tanks with an easily accessible trap for large debris installed upstream of the AquaSweep™ Oil Water Separator.
- 4.8 Install minimum one inch vents on the inlet, outlet, manway and the separator in accordance with federal, state, and local codes.
- 4.9 All unused separator openings must be properly sealed and tested to be liquid and vapor tight prior to putting the separator into service.
- 4.10 **DO NOT WELD ON THE SEPARATOR, MODIFY OR PENETRATE THE SEPARATOR STRUCTURE IN ANY WAY WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE S SEPARATOR MANUFACTURER.**
- 4.11 Install Oil Water Separator control package per manufacturer's instructions. The control unit inside the separator must be accessible at all times. The control panel must be placed where an attendant can physically see and hear the alarms. The location of the control panel can be inside or outside, but must remain within 900 feet (274.3 m) of the control stem.
- 4.12 Install pump out piping if required. The manways and pump out piping must be accessible at all times.
- 4.11 All separator accessories shall be installed as required per local codes. Anti-siphon devices, overflow shut-offs and alarms, vents, gauges, emergency vents, etc. are common requirements for separators.

START-UP INSTRUCTIONS FOR AQUASWEEP™ OIL WATER SEPARATORS

- 1.0** Avoid over pressurizing the AquaSweep™ Oil Water Separator. Verify that all vents are installed correctly and are free of obstructions.
- 2.0** Open all inlet and outlet valves completely. Fill the unit completely to the maximum operating level with clean water until water is coming out of the outlet. The filling of the tank can be performed through a temporary fitting in the piping or where the inlet piping initiates. The water can be delivered via a fire hose, garden hose or delivery truck. Verify the height of the water with a gauge stick through the manway or other available opening.
- 3.0** Follow the installation and operating procedures for the Oil Water Separator controls package given by the controls equipment manufacturer.
- 4.0** Another indication that there is enough water in the tank is the control level alarm that is now installed has stopped alarming.

OPERATING INSTRUCTIONS FOR AQUASWEEP™ OIL WATER SEPARATORS

- 1.0** Oil accumulated in the separator must be removed whenever the level exceeds 20% of the tank volume or whenever the oil level control alarm is in alarm condition. Check oil level and alarm operation frequently, especially after a heavy rainfall or oil spill.
- 1.1** To remove oil when the oil level control alarm is in alarm condition, close the inlet and outlet valves, closing the outlet valve first. This will insure that no additional fluids are released to the environment. Remove the oil with an appropriate pump only after the inlet and outlet valves have been closed for at least five minutes. This will insure there is little or no flow within the separator and the separator has had a chance to become static.
- 1.2** Pump oil out through the pump port until only a small amount of oil (one inch or less) is left within the tank. Operating efficiency generally improves if a small amount of oil remains in the separator.
- 1.3** Refill the separator with water to replace the removed oil in accordance with the Start-up Instructions. The oil water separator must be operated filled with water to the design operating level at all times.
- 1.4** Dispose of removed oil properly, in accordance with local, state and federal regulations.
- 2.0** Units equipped with an automatic waste oil pumping system require a system to refill the unit with water after oil is removed. The oil water separator must be operated filled with water to the design operating level at all times.
- 3.0** During periods of little rainfall, water will evaporate and reduce the efficiency of the unit. Check the water level often and replenish as necessary.

MAINTENANCE INSTRUCTIONS FOR AQUASWEEP™ OIL WATER SEPARATORS

Reduced performance and damage to the coalescer panels, secondary coalescer, and other components may occur if the unit is not properly maintained. A maintenance plan for AquaSweep™ gravity oil water separator should include:

- Periodic inspection to check for and remove the oil, sludge, sand, and other sediments in the tanks' compartments.
- Periodic inspection and replacement of coalescing media.
- Check for free oil in the effluent after heavy rainfalls to verify effective separator and alarm operation.
- Periodic monitoring of the effluent for free oil. Check for oil in the effluent.

Care must be taken when entering the AquaSweep™ Oil Water Separator. Surfaces will be slippery and flammable and combustible vapors may be present. Follow all local codes and OSHA guidelines concerning entry into confined spaces.

Required maintenance procedures for each compartment includes, but is not limited to, the following:

- 1.0** Upstream interceptor (if present): Frequently examine for and remove heavy debris common in storm water run-off. Remove any material, such as paper, vegetation, etc., that would obstruct the separator's inlet piping or impede the separator's performance.
- 2.0** Sediment Chamber: Periodically measure the sediment depth on the tank bottom with a wooden gauge stick. Pump out sludge when it is necessary. It may be required to remove the inlet pipe(s) and/or primary coalescer to be able to pump out the sediment chamber. The chamber should be inspected and cleaned once a year, or more often as needed, as follows:
 - 2.0.1 Shut off the inlet and outlet valves and pump out all fluid from the separator. Dispose the fluid in accordance with all Federal, State, and Local codes.
 - 2.0.2 Using a high pressure water spray or steam cleaner, wash down inner tank walls and pump out the slurry.
 - 2.0.3 Inspect the interior tank coating (if applicable) for damage and repair as necessary.
- 3.0** Primary Coalescer Containment: At least annually, in conjunction with servicing the sediment chamber, replace or clear the inlet pipes and coalescer plates or packs of oil/grease accumulations with a suction hose or portable oil pump and pressure spray or steam clean the plates and packs as necessary. Do not use soaps or detergents to clean the plates or packs since this will introduce emulsifiers to the unit. Clean the coalescer compartment as needed to prevent an accumulation of sediment that would impede oil water separation. Inspect the interior tank coating (if applicable) for damage and repair as necessary. Inspect components for damage and replace if necessary.
- 4.0** Secondary Coalescer Containment (Models 3 and 5, only): After heavy rainfall or whenever it is likely that inlet fluids will bring increased amounts of sediment into the separator or at least annually, replace or clean the secondary coalescer.
 - 4.0.1 Remove the secondary coalescer from the tank through the access manway.
 - 4.0.2 Using water only, pressure spray or steam clean the secondary coalescer upstream of the oil water separator's inlet as necessary. Do not use soaps or detergents to clean the plates since this will introduce emulsifiers to the unit.
 - 4.0.3 Inspect the secondary coalescer for damage and replace if necessary.
 - 4.0.4 Re-install the clean or new elements into the secondary coalescer housing.
- 5.0** Auxiliary Equipment: Periodically, check any and all auxiliary equipment, such as level alarms, floats, pumps for damage and proper operation. Repair or replace damaged equipment prior to returning the oil water separator to service.
 - 5.0.1 After tank has been pumped out and refilled and the floats have been checked and serviced, ensure that there are no alarm conditions seen on the control panel and all controls have returned to the normal operating positions.
- 6.0** After all of the servicing has been performed on the tank, completely fill the separator with clean water. The unit is now ready to be returned to service by following the "Start-up Instructions".
- 7.0** Aboveground separator requirements:

The separator operator should perform periodic walk-around inspections to identify and repair areas of damage to the vessel or the coating itself and check for proper drainage around the separator area.

- 7.1 It is imperative that the separator exterior be inspected periodically to ensure that the integrity of the coating is maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the separator is located. Special consideration should be given to the selection of the paint, surface preparation and coating application. The coating selected should be suitable for use with the current coating, or the existing coating should be removed. The coating selected should be of industrial quality.
- 7.2 Proper site preparation and maintenance are vital to ensure drainage of surface water. Should ground conditions change or settlement occur, take the appropriate steps to maintain proper drainage and prevent standing water near or under the separator area.
- 7.2.1 For diked separators, remove any product spills immediately. Be sure to dispose of hazardous material properly.
- 7.2.2 For diked separators fitted with a drain, drain off water only. Drain openings are required to be maintained liquid tight.

TROUBLESHOOTING INSTRUCTIONS

Problem	Possible Causes	Recommended Action
Excessive oil in effluent	Storm water is pumped into unit	Change to gravity flow
	Flow rates into unit exceed rated capacity	Decrease flow rate
	Detergents or surfactants in unit	Remove source of detergents or surfactants
	Oil level greater than rated storage capacity	Remove oil
	Excessive fluid turbulence in unit	Check for debris in inlet piping Verify that inlet piping valves are fully open
	Dissolved hydrocarbons in unit	Remove source of hydrocarbons
	Large amount of sediment in unit or effluent	Remove source of sediment from storm water drainage area and clean unit
	Influent contains oil with high specific gravity	Decrease flow rate or remove source of high specific gravity oil
	pH of effluent greater than 10 or less than 4	Remove sources of influent with pH greater than 10 or less than 4
Storm water back-up in drainage area	Excessive build up of sediment or sludge in unit	Clean out unit
	Closed inlet or outlet valve	Fully Open the closed valve(s)
	Inlet piping not properly vented	Verify that inlet is properly vented, check for obstruction
	Debris in inlet or outlet	Remove obstruction in inlet or outlet
Large amount of suspended solids in effluent	Excessive build up of sediment or sludge in unit	Clean out unit
	Large amount of solids in storm water drainage area	Remove source of sediment from storm water drainage area and clean unit
	Flow is too fast through separator	Take measures necessary to decrease influent flow.

Disclaimer

These instructions are intended only as an aid to tank installers who are knowledgeable and experienced in underground tank installation. Compliance herewith does not necessarily meet the requirements of applicable federal, state and local laws, regulations and ordinances concerning separator installation. STI makes no warranties, express or implied, including but not limited to, any implied warranties of merchantability or fitness for a particular purpose, as a result of these installation instructions.

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