



Kleerwater™ Oil Water Separator Maintenance Instructions – Bagged Media

May, 2007

General Information

Normal maintenance of Kleerwater™ Oil Water Separators can be done from grade level. If there should be a need to enter the tank, such as an internal coating inspection, be sure to follow and comply with all of the caution, warning, and note statements.

CAUTION: Separated liquid oil and vapors are flammable and/or combustible.

WARNING: NEVER enter an oil water separator or enclosed space, under any conditions, without proper training and OSHA approved equipment. Consult OSHA guidelines 29 CFR Part 1910 “Permit Required Confined Spaces”.

CAUTION: All enclosed spaces must be properly vented prior to entry to avoid ignition of flammable materials or vapors.

NOTE: Oil water separator atmosphere must be properly tested for combustible vapors and oxygen content prior to entry.

NOTE: Entering the oil water separator without using a self-contained breathing apparatus may result in inhalation of hazardous fumes, causing headache, dizziness, nausea, loss of consciousness, and death. Required entry equipment includes, but is not limited to:

- Lifelines
- Safety harness (safety belts are unacceptable)
- Respirator (canister type)
- Self-contained breathing apparatus
- Explosion proof lighting
- Rescue harness and ropes
- Compressed gas air horns, whistles, explosion proof radios (communication purposes)

NOTE: Be sure to inspect and replace manway gaskets as necessary when the oil water separator is shut down for maintenance.

CAUTION: Interior surfaces of the oil water separator will be slippery.

The Kleerwater™ Oil Water Separator has been designed for long-term, trouble-free operation. The following maintenance should be performed as needed or in accordance with a facility maintenance schedule.

Periodic inspection of:

- Upstream trash traps and/or trench drains
- Effluent for oils and other contaminants in accordance with local codes and permits
- Oil level in accordance with local codes and permits

Kleerwater™ Oil Water Separators with oil level sensors require oil removal when alarm is activated. Remove the oil and then refill the separator with clean water (see Start-Up Instructions).

Kleerwater™ Oil Water Separators without oil level sensors require oil level checks by using a gauge stick with water sensing paste. If oil/water interface level is below that shown on the Oil Level Chart, oil needs to be removed and then refill the separator with clean water.

WARNING: If the oil is not pumped out of the separator, the oil concentration in the effluent may exceed the desired levels. Oil should only be removed during non-flow conditions to ensure pure oil draw-off.

If contaminants are found in the effluent, close the valves on the inlet and outlet lines (if installed), determine what the requirements are for restoring proper functioning of the separator and take appropriate action(s).

For optimum performance, maintenance is required as needed or at least:

- Once per year or when
- Sludge in the settling chamber is 12 inches deep
- The effluent exhibits an oil sheen or contains high contaminant levels.

Inspect the separator after a heavy rainfall to check for signs of malfunction due to excessive flows. If the separator has been cleaned within the year and only sludge has built up while the effluent water is contaminant-free, it may be sufficient to vacuum the sludge from the settling chamber and refill the separator with clean water (see Start-Up instructions).

Trash Traps/Trench Drains:

1. Open the trash trap and clean out all debris and foreign materials.
2. The trash trap should be inspected at frequent intervals, such as daily, weekly or monthly, until the proper inspection schedule can be established. This schedule is established by how quickly the trash trap and/or trench drain gets loaded with trash, debris, or other material that may foul the separator.
3. Inspect the trash trap and/or trench drain for any damage to the screens. If any of the screens are damaged, replace them prior to restarting the oil water separator.
4. Remove all sludge, debris, and liquids from the trash trap and/or trench drain and dispose in accordance with all local codes and permits.

Oil Removal Procedures:

NOTE: Oil should only be removed during non-flow conditions to ensure pure oil draw-off.

1. If inlet and outlet isolation valves were installed with the unit, close each valve and verify that they are closed.
2. Unbolt manway covers and remove the covers and gaskets. Be careful not to damage the gaskets. Also, store all nuts and bolts in a safe place away from the open hole.

- a. If gasket was damaged during removal of manway or during operation, contact the original Kleerwater™ Oil Water Separator manufacturer for a new gasket.
3. Check the oxygen content and other vapor content using an approved explosion meter.

DO NOT ENTER THE TANK, AS THIS IS A CONFINED SPACE AND REQUIRES OSHA TRAINING AND QUALIFICATION PRIOR TO ENTERING THE TANK.

NOTE: Depending on the nature of service, there may be explosive vapors present inside the separator. Do not insert any electrical instruments or equipment into the separator which are not intrinsically safe, properly grounded, or statically discharged.

4. Once the separator environment has been deemed safe to work around, using a vacuum truck, suction out the oil from the entire tank. This can be accomplished by going through either or both of the two manways or the oil removal fitting provided on the separator.
 - a. Start at the outlet side and work towards the inlet side, making sure to skim the oil off the top as carefully as possible. Try not to dispose of too much water as this adds to disposal costs.
 - b. During complete internal inspections of the tank, all of the tank's liquid and sludge contents must be removed.

NOTE: If there is an audible alarm associated with the level control system, it should be silenced if the alarm is activated.

5. Refill separator with clean water until the high oil level warning alarm is deactivated (see Start-Up instructions).

Mixed Oil and Water Removal Procedures:

1. If inlet and outlet isolation valves were installed with the unit, close each valve and verify that they are closed.
2. Unbolt manway covers and remove the covers and gaskets. Be careful not to damage the gaskets. Also, store all nuts and bolts in a safe place away from the open hole.
 - a. If gasket was damaged during removal of manway or during operation, contact the original Kleerwater™ Oil Water Separator manufacturer for a new gasket.
3. Check the oxygen content and other vapor content using an approved explosion meter.

DO NOT ENTER THE TANK, AS THIS IS A CONFINED SPACE AND REQUIRES OSHA TRAINING AND QUALIFICATION PRIOR TO ENTERING THE TANK.

NOTE: Depending on the nature of service, there may be explosive vapors present inside the separator. Do not insert any electrical instruments or equipment into the separator which are not intrinsically safe, properly grounded, or statically discharged.

4. Once the separator environment has been deemed safe to work around, using a vacuum truck, suction out the mixed oil and water from the entire tank. This can be accomplished by going through both manways provided on the separator or through the oil removal fitting.
5. Refill separator with clean water (see Start-Up instructions).

Major Oil Spill Response Procedures:

NOTE: A major oil spill is a spill that exceeds the normal oil storage capacity of the oil water separator.

1. If inlet and outlet isolation valves were installed with the unit, immediately close the outlet

valve first, then the inlet valve. Verify each valve closed. This is performed to prevent oil from passing through the separator without being properly treated. If there are no inlet and outlet isolation valves, try to minimize/contain the amount of contents entering the tank.

2. In the event of a major oil spill, notify proper authorities as required by federal, state, and local laws.

3. Once the spill event has been contained, unbolt manway covers and remove the covers and gaskets. Be careful not to damage the gaskets. Also, store all nuts and bolts in a safe place away from the open hole.

a. If gasket was damaged during removal of manway or during operation, contact the original Kleerwater™ Oil Water Separator manufacturer for a new gasket.

4. Check the oxygen content and other vapor content using an approved explosion meter.

DO NOT ENTER THE TANK, AS THIS IS A CONFINED SPACE AND REQUIRES OSHA TRAINING AND QUALIFICATION PRIOR TO ENTERING THE TANK.

NOTE: Depending on the nature of service, there may be explosive vapors present inside the separator. Do not insert any electrical instruments or equipment into the separator which are not intrinsically safe, properly grounded, or statically discharged.

5. Once the separator environment has been deemed safe to work around, using a vacuum truck, suction out the entire contents from the tank. This can be accomplished by going through both manways provided on the separator or through the oil removal fitting.

6. Slowly open the inlet valve and allow any oil/water mixture to drain into the separator.

7. Purge any oil from the inlet pipe by rinsing the inlet pipe with clean water. Continue rinsing the inlet pipe until the separator is full. Allow the separator time to settle.

a. If there is no oil visible. No further action is required.

b. If there is oil still visible, repeat step 5 and 7 until no oil is visible in the tank.

8. Once there is no oil visible in the tank, open the outlet valve.

9. Ensure the separator is completely full of clean water.

Sludge Removal Procedures:

1. Determine where the sludge/water interface is located using a wooden gauge stick or similar device.

2. Open the manway closest to the inlet side of the tank. This is the settling chamber.

3. Place the wooden gauge stick or similar device down through the manway.

4. Slowly lower the gauge stick until it comes in contact with the sludge. Mark the stick.

5. Push the stick downward until it reaches the bottom of the tank. Mark the stick.

6. The sludge depth is the difference between two marks.

7. To remove the sludge, insert a 3 to 4 inch hose through the manway.

8. Lower the hose to the sludge/water interface location.

9. Suction out the sludge while slowly lowering the hose nozzle until it comes in contact with the bottom of the tank.

10. Move the hose from side to side all along the bottom of the tank. This will ensure that most of the sludge is removed.

11. For complete sludge removal, all of the liquid will need to be suctioned from the settling chamber.

12. Once the liquid is removed, use a garden hose or pressure washer to spray down into the tank, aiming at the sides and the bottom to loosen any heavy sludge. Hot water may be helpful

for this operation.

13. Suction out the resultant slurry.

14. Refill with clean water. (See Start-Up Instructions)

General OWS Cleaning Procedures:

If the separator is not properly maintained, the unit may not function properly or at all.

NOTE: Over a period of time, sediment, oil, and grease will build up on the walls and floors of the separator. Dirt and heavy oil may also build up in the coalescer pack, reducing the unit's efficiency. Periodic cleaning of the coalescer pack is required.

Important: It is recommended that the separator be cleaned as needed or at least once a year. Keep inspection and maintenance logs and have them available for ready reference.

Settling Chamber

1. Remove manway cover over the settling chamber. Be careful not to damage the gasket.

2. Pump out the contents of the OWS (see Mixed Oil and Water Removal Procedures).

3. Gauge the level of sludge with a wooden gauge stick or similar device.

Important: The level of sludge should not be allowed to accumulate higher than 15% of the tank diameter or 12 inches, whichever is lesser, from the bottom of the tank.

4. Remove the sludge with a suction hose (see Sludge Removal Procedures).

5. Direct a high pressure hose downward to loosen any caked sludge on the OWS sides and bottom.

NOTE: Use of high-temperature (not to exceed 120° F), high-pressure washing equipment can be helpful in separator cleaning. Care should be taken not to damage internal coating by excessive pressure or temperature.

6. Attach spray nozzle wand extension to the high-pressure hose.

7. Direct spray downward and toward the inlet head to loosen up any caked sludge that may have accumulated on the inlet head.

8. Direct the spray to the separator walls, top, and bottom.

9. Remove the slurry with the suction hose.

Oil Water Separator Chamber

1. Disconnect any and all non- voltage carrying sensor lines to the oil level sensor.

2. Carefully remove the oil level sensor.

3. Carefully check the oil level sensor floats. If the floats do not slide easily on the stem or have sludge on them, clean the oil level sensor. Use a parts washer and mineral spirits to remove accumulated oil, grease, or sludge.

4. Check the oil level sensor with an ohm meter to assure proper operation.

5. Place the oil level sensor in a safe storage area to prevent damage.

6. Remove the separator manway cover to expose the oil water separator chamber. Be careful not to damage the gasket.

7. Gauge the level of sludge with a wooden gauge stick or similar device.

8. Remove the accumulated sludge with a suction hose (see Sludge Removal Procedures).

9. Direct a high-pressure hose downward and all around the chamber to loosen caked sludge on the separator sides, top, and bottom.

10. Attach spray nozzle wand extension to the high-pressure hose.

11. Direct the spray on the inlet side of the coalescer container. This will loosen any caked sludge that may have accumulated on the container.

Coalescer Bag Cleaning:

The coalescing media must be cleaned periodically of sludge and oils to operate properly. Your Kleerwater Oil Water Separator was supplied with a fabricated “Bag Grabber” hook assembly and tamper that screws on to a client / customer supplied ½” threaded pipe. The pipe should be cut to the desired length that best suits the separator application.

12. Remove the coalescer media container lid with the “Bag Grabber” hook assembly. Pull the lid out of the separator through the manway opening. Pull the lid slowly, straight up, to avoid contact with the inside of the manway neck. Use a pressure spray nozzle wand to clean the lid, if necessary then, set it aside.
13. Now you are ready to remove the coalescer bags. Using the “Bag Grabber” hook assembly, grab the top coalescer bag and gently pull it up out of the coalescer frame assembly. Should the bag assembly catch on an unknown object, try to determine where the catch is, free it and then proceed with removing the coalescer bag. Do not force pull the bag; it may be torn or damaged.
14. Inspect the bag for soiled media as it is pulled upward. If pressure washing is necessary, hold the coalescer bag over the manway opening that accesses the grit and sludge chamber which is closest to the inlet side of the separator. Pressure wash the oil and sludge from the bag, using a wide angle nozzle, into that compartment. Continue removing and cleaning coalescer bags until there is no evidence of soiled media. Bags may also be washed in a tub or other receptacle, and the wash water poured back into the separator through the manway closest to the inlet side of the separator (NOT into the manway over the coalescer box).
15. When washing is completed, hook each bag near the end (not at the stitched ends) using the “Bag Grabber” and lower the bag into the coalescer frame, manipulating the bag so that it lays as flat as possible. Use the Kleerwater™ tamping device to gently level the bag contents within the coalescer frame as necessary. Special attention should be given to the corners of the bag so that they are tamped into the corners of the media container. Repeat this process with each subsequent bag.
16. Gently lower the lid onto the guide angles at the top of the media container. Allow the lid to slide into place.
17. Replace the manway cover. If gasket was damaged during removal of manway or during operation, contact the original Kleerwater™ Oil Water Separator manufacturer for a new gasket.
18. If necessary, remove the slurry in the grit chamber with a suction hose.
19. Re-install the oil level sensor and re-attach the electrical wiring.
20. Refill separator with clean water and open inlet and outlet valves as required to not exceed the unit’s maximum rated flow capacity.

OIL LEVEL CHART FOR KLEERWATER™ OIL WATER SEPARATORS

Determine Oil Level during periods of no water flow to the separator and with separator liquid level at the minimum operating level.

- Separator must be operated at least at the minimum operating level. If the liquid level in the separator is below the minimum operating level, fill separator with clean water until the minimum operating level is reached.

- Water Level can be determined by using water indicating paste on a tank gauging stick and finding where the indicating paste did not change color. The level where the paste did not change color is where no water exists.

Oil Level = Min. Operating Liquid Level – Water Level in Tank = X inches

Separator Size (Gal)	Tank Diameter (in)	High Oil Level (inches from tank top)	High-High Oil Level (inches from tank top)
150	30	5.5	12.0
285	38	8.0	14.0
550	42	9.0	15.0
700	48	11.0	18.0
1,000	48	11.0	18.0
2,000	64	14.5	23.5
2,500	64	14.5	23.5
3,000	64	14.5	23.5
4,000	64	14.5	23.5
5,000	72	16.0	25.5
6,000	72	16.0	25.5
8,000	84	18.5	31.0
9,000	96	21.0	35.0
10,000	96	21.0	35.0
12,000	96	21.0	35.0
15,000	96	21.0	35.0
20,000	120	27.0	46.0
25,000	126	28.0	46.0
30,000	126	28.0	46.0