



## SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

# TANK DELIVERY AND SETTING

To insure that all work proceeds safely and efficiently, check these items prior to delivery of the Singulair Green tank.

- ✓ Does the driver have complete and accurate directions to the installation?
- ✓ Does the driver have the Singulair installer's tool kit?
- ✓ Are the appropriate aerator mounting riser, access cover, Bio-Kinetic system mounting riser, pretreatment riser, sealed access covers and extension risers included?
- ✓ Are additional anti-flotation measures required for this installation?
- ✓ Is a sufficient amount of water and gravel available for the installation?
- ✓ Is an adequate supply of sealing material available for all plumbing connections?
- ✓ Does the delivery vehicle have the proper pick-up bar, cable, straps and/or chain?
- ✓ Is the proper Service Pro control center available for delivery with the tank?
- ✓ Is there sufficient underground electrical cable to reach from the control center to the tank?

**PLEASE NOTE:** The Singulair Green tank is constructed of high density polyethylene. All joints have been factory sealed for your convenience. This will minimize tank loading, unloading and setting time at the site. The Singulair Green tank has been designed for underground use only. Do not install the tank in a location that is subject to vehicular traffic.

### CHECKING THE EXCAVATION

Before tank setting begins, verify that the excavation is level and free of sharp stones and construction debris. Clear out any objects that could come in contact with the tank.

The length, width and depth of the excavation should be checked. The excavation should have sufficient overdig to allow between 18" to 24" of clearance on both sides and 6" to 12" of clearance on the inlet and outlet ends of the Singulair Green system. In addition, the excavation should allow for a minimum of 6" and a maximum of 16½" of cover over the top of the tank. For deeper installations, consult the Deeper Burial Requirements section of this guide. Failure to follow the excavation and backfilling guidelines may result in tank damage and will void the system warranty.

Check the influent and effluent sewer line trenches. The trench depth should correspond with the Singulair Green system inlet and outlet connections and the trenches should be smooth to prevent damage to the sewer lines.

A tank leveling pad should be installed in the bottom of the excavation. The leveling pad should be a minimum of 4" thick and leveled to within ¼" from side to side and end to end. The elevation of the top of the leveling pad should correspond to the outside bottom of the Singulair Green tank when installed. In areas with unstable soil conditions, a reinforced concrete pad may be required under the Singulair Green tank.

Safe working conditions must be established and maintained during the entire installation procedure. Unstable soil conditions require constant monitoring of the site to insure safety. Installation procedures, equipment and personnel should always comply with applicable safety regulations as well as all federal, state and local codes.



## TEMPORARY UNIT STORAGE

If a Singulair Green tank is delivered before installation can occur, store the tank on smooth ground with no rocks or sharp objects against the tank. Chock the tank with sandbags to prevent tank movement. If high winds are anticipated, tie the tank down to prevent any damage.

## PREPARING THE SINGULAIR GREEN® TANK

Before installing the Singulair Green tank, inspect for signs of damage that may have occurred during transportation or handling. Damaged tanks could leak and should not be installed. Check the inlet and outlet couplings for any signs of damage that would prevent the use of flexible watertight connectors meeting ASTM C 1644- 06-07. Inspect all risers and access covers to insure no damage has occurred. Verify that all riser and access cover fasteners are securely attached. Do not allow dirt or mud to enter any part of the Singulair Green system or sewer lines. If dirt or mud enters any portion of the system, it must be removed to insure proper system operation. Removing the dirt or mud may require repeated flushing and tank pumping.

**CAUTION:** Extreme care should be used in the vicinity of any excavation. A delivery vehicle can place excessive loading on excavation sidewalls and care must be taken in its positioning. Once installed, no vehicle should operate over the tank or any other part of the treatment system.

## TANK SETTING AND SAFETY

Make sure the delivery vehicle outriggers are firmly placed on stable soil at the excavation site. All personnel must be out of the excavation area and at a safe distance from the tank. Before lifting the tank, check all lifting chains, straps or cables to be sure they are properly secured. Lift the tank using at least four of the molded lifting lugs located on the Singulair Green tank. Carefully lower the tank into



the excavation. Stop the tank several inches above the excavation floor and position it in the desired location. Lower the tank carefully until all tension is off the lifting device. Do not remove the lifting chains, straps or cables until tank leveling has been completed.

## LEVELING THE TANK

Remove the access covers and place a level on the risers to verify that the tank is level within 1/4" from side to side



and end to end. If the tank needs to be raised more than 6" to apply leveling material, all personnel should move to a safe location so the tank can be fully removed from the excavation. Fall through the system from inlet invert to outlet invert is 4". Therefore, the outlet invert of the system must be installed 4" lower than the inlet invert.

## MOUNTING RISER AND OPTIONAL EXTENSION RISER INSTALLATION

If extension risers are required, install them as needed above each mounting riser. All risers must be at or above grade. To insure a watertight seal, install an o-ring gasket in all joints between the risers.

Access to the pretreatment chamber must be developed to grade or above grade as required by state regulation. Place a sealed waterproof access cover on the pretreatment chamber access opening. Place a sealed access cover on the aerator mounting riser and a waterproof sealed access cover on the Bio-Kinetic system mounting riser before backfilling.

## SEWER LINE INSTALLATION

Sewer lines may be installed as soon as the Singulair Green tank has been leveled. Sewer line trenches must be smoothly excavated and free of debris or sharp objects.

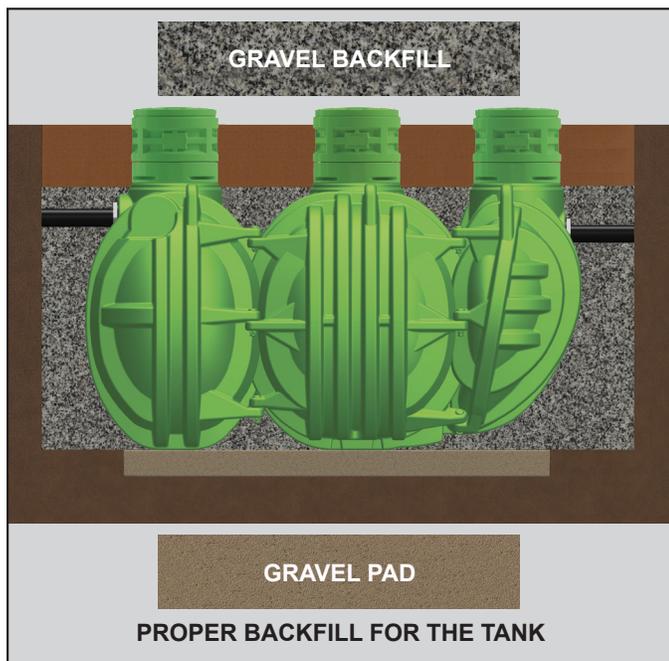
The trenches must allow a minimum slope of 1.33% per of fall per linear foot. Influent and effluent sewer lines must be 4" in diameter. The influent and effluent lines should be PVC pipe and connected to the Singulair tank with a flexible water-tight connector conforming to ASTM C 1644-06 PAR 7. Influent and effluent lines must be laid continuously and unspliced from the tank to the undisturbed earth beyond the tank excavation site. Underground electrical cable for electrical service to the Singulair aerator should be installed in the influent sewer line trench before backfilling the Singulair Green tank. Refer to the "ELECTRICAL WIRING AND CONTROL CENTER INSTALLATION" instructions for complete details.

**CAUTION:** Do not attempt to adjust the position of the tank or sewer lines with the backhoe bucket. Excessive force may damage the inlet and/or outlet couplings.

### BACKFILLING THE GREEN SYSTEM

Prior to backfilling, add a minimum of 12" (250 gallons) of ballast water to the Singulair Green tank to prevent shifting in the excavation. Fill each chamber to an equal level. Do not add water through the clarifier access opening. The clarification chamber will be filled through the transfer opening between the aeration and clarification chambers as the aeration chamber is filled. The Singulair Green tank must be backfilled immediately after the sewer lines, underground electrical cable and ballast water are in place.

Cover all openings, then begin backfilling with gravel under and around the sloped clarifier. Continue to add gravel until



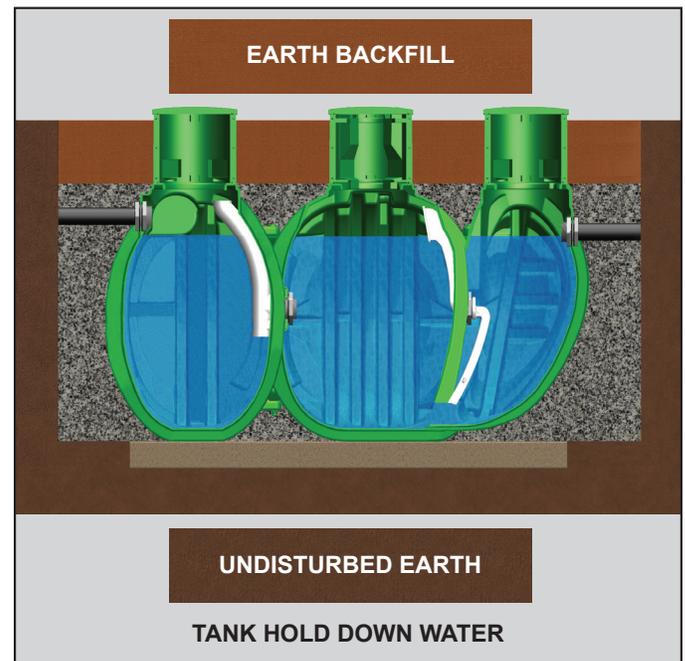
the discharge line from the Singulair Green tank is covered. Proceed to the inlet end of the pretreatment chamber and add gravel until the inlet line is covered. Fine, loose earth may be used to backfill the remainder of the excavation. Be sure that the backfill is free of rocks, sharp objects, large clumps of earth and construction debris. Never use clay

for backfill material. The backfill must flow freely and care should be taken to insure that all recesses formed between the ribs and beneath the area between the pretreatment and aeration chambers are completely filled. Add backfill evenly around the entire perimeter of the Singulair Green tank in 12" increments. Hand tamp each layer of fill to compact soil. When backfilling over the tank, add fill to the area between the risers first. Final grading should be 3" to 6" below the top of each access cover and should slope away from the tank so surface runoff will drain away from the Singulair Green system. Use extreme care when backfilling the excavation. Do not allow dirt or mud to enter any part of the Singulair Green system or sewer lines.

### TANK HOLD DOWN WATER

The Singulair Green tank must be filled with clean water to the outlet invert immediately following backfilling. The water must be free of leaves, mud, grit or other materials that might interfere with system operation.

When pumping or dewatering the Singulair Green tank, only pump the pretreatment chamber. Then, promptly refill the



tank to capacity with clean water. Dewatering and leaving the Singulair Green tank empty will effect tank integrity and void the Singulair Green warranty.

### DEEPER BURIAL REQUIREMENTS

Special consideration should be taken if the Singulair Green tank is buried deeper than 16 1/2" below grade. However, the tank should never be buried deeper than 34 1/2" below grade. If deep burial is required, first fill the tank with 12" of clean ballast water. Next, backfill the entire tank with gravel up to the base of the risers. Once gravel is in place, fill the tank with clean water to the design flow line. Finally, backfill to grade with native soil.

## SPECIAL ANTI-FLOTATION SYSTEM

It may be necessary to provide anti-flotation measures to secure the Singulair Green tank.

For installations with soil cover between 0" and 16.5" over the top of the tank, anti-flotation measures are required. The top of the tank is defined as the point at which the risers connect to the tank. Anti-flotation must include a concrete beam that is either cast-in-place or poured, provides a minimum of 8 square feet of surface area in the plane and is level with the ground surface on two sides of the tank. Total concrete volume on each of these beams must be greater than 2.33 cubic feet. Norweco has forms available to meet this requirement. The two beams must be connected to the molded in lifting lugs on the Singulair Green tanks using anchors and straps rated to 4,000 pounds tensile strength each.

For installations with soil cover greater than 16.5" anti-flotation measures are not required.

## COMPLETING THE INSTALLATION

Once backfilling has been completed and the tank has been filled with clean water, the access openings must be secured. Install a sealed access cover on the pretreatment and clarification chamber risers. Install a cover on the aeration chamber riser. Secure all access risers with the fasteners that have been provided. Installation of the control center and underground electrical cable are normally completed before leaving the site. Refer to "ELECTRICAL WIRING AND CONTROL CENTER INSTALLATION" instructions for details.



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# MODEL AT 1500

## UV DISINFECTION SYSTEM

# INSTALLATION AND OPERATION MANUAL

The Model AT 1500 UV disinfection system is listed with Underwriters Laboratories (UL) under Standard 979 as a residential treatment device. The installer should provide a power disconnect switch mounted to the exterior of the facility being serviced to de-energize power to the unit during maintenance. Electrical work must be performed in accordance with the latest edition of the National Electrical Code, as well as all applicable local codes. The Model AT 1500 UV disinfection system conforms to the applicable provisions of the Code of Federal Regulations (CFR) requirements including, Title 21, Chapter 1, Subchapter J, Radiological Health. **CAUTION: DO NOT LOOK DIRECTLY AT THE UV LAMP OR EXPOSE SKIN DURING OPERATION. PERMANENT EYE DAMAGE AND SKIN BURNS WILL OCCUR FROM UV RADIATION EXPOSURE. UV BLOCKING SAFETY GLASSES MUST BE WORN DURING INSTALLATION, SERVICE OR ANY TIME THE BULB MAY BE ILLUMINATED.**

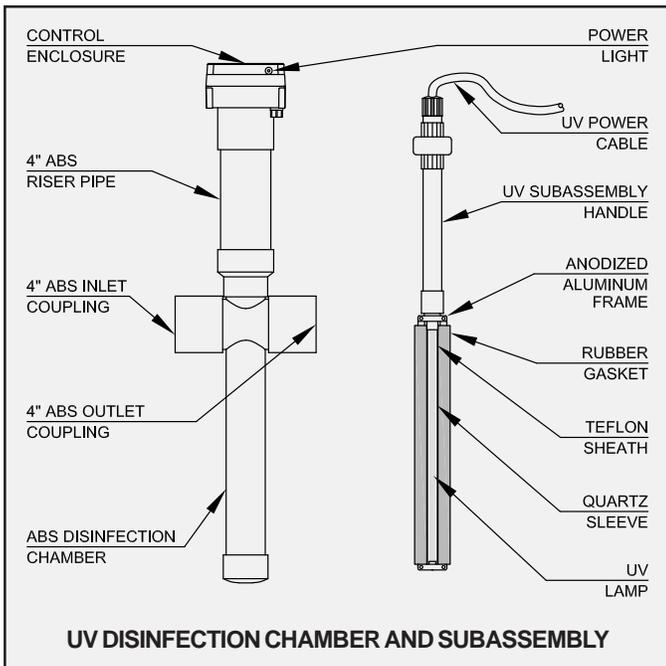
### COMPONENTS

The Model AT 1500 UV disinfection system consists of the following components:

- |                           |   |
|---------------------------|---|
| 1) Control enclosure      | 8) Power cable with watertight connector  |
| 2) 4" ABS riser pipe      | 9) UV subassembly with anodized aluminum frame, quartz sleeve and Teflon sheath |
| 3) 4" ABS inlet coupling  | 10) Subassembly handle  |
| 4) Turbulence inducer     |   |
| 5) 4" ABS outlet coupling |   |
| 6) Disinfection chamber   |   |
| 7) UV lamp (bulb)         |   |

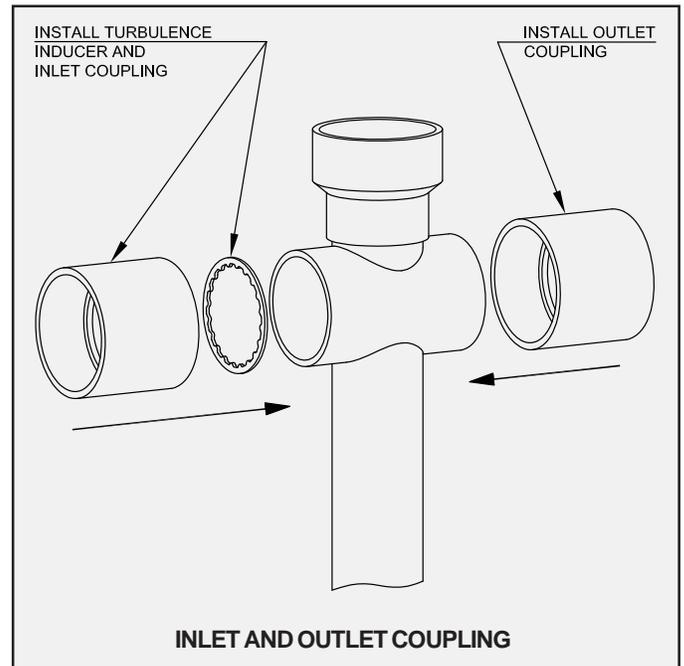
These components should be supplied by the installer:

- |                        |                               |
|------------------------|-------------------------------|
| 1) Disconnect switch   | 6) Isopropyl alcohol          |
| 2) Solvent cement      | 7) #14/2 AWG cable            |
| 3) Hacksaw             | 8) Conduit and fittings       |
| 4) Glycerin (optional) | 9) Flat head screwdriver      |
| 5) Clean, soft cloth   | 10) Phillips head screwdriver |



### INSTALLATION INSTRUCTIONS

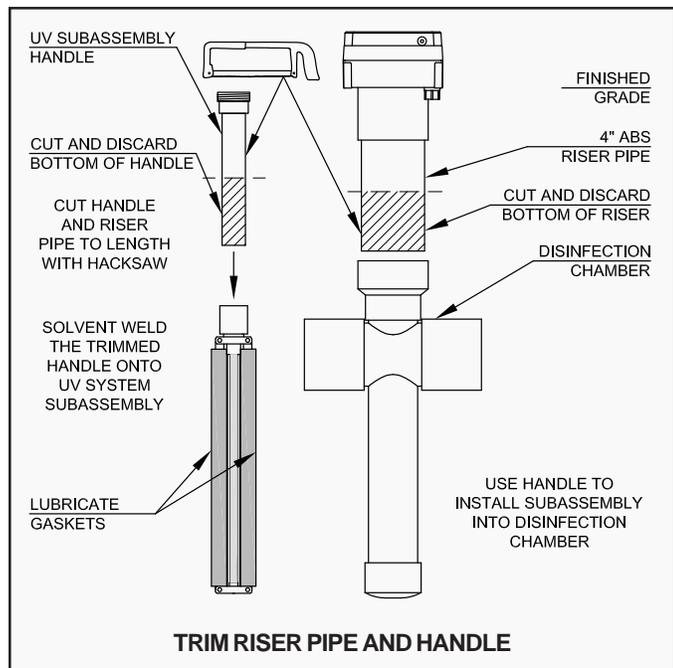
1. The excavation for the upstream wastewater treatment system should include an additional 3 feet of length to allow for installation of the Model AT 1500.
2. Carefully unpack the Model AT 1500 system. Remove and properly discard all packaging materials from the system components. The UV lamp should remain in the protective shipping sleeve until it is installed.
3. Insert the turbulence inducer into the 4" inlet coupling. Solvent weld the inlet coupling to the disinfection chamber with the turbulence inducer towards the chamber. Solvent weld the 4" outlet coupling to the disinfection chamber.



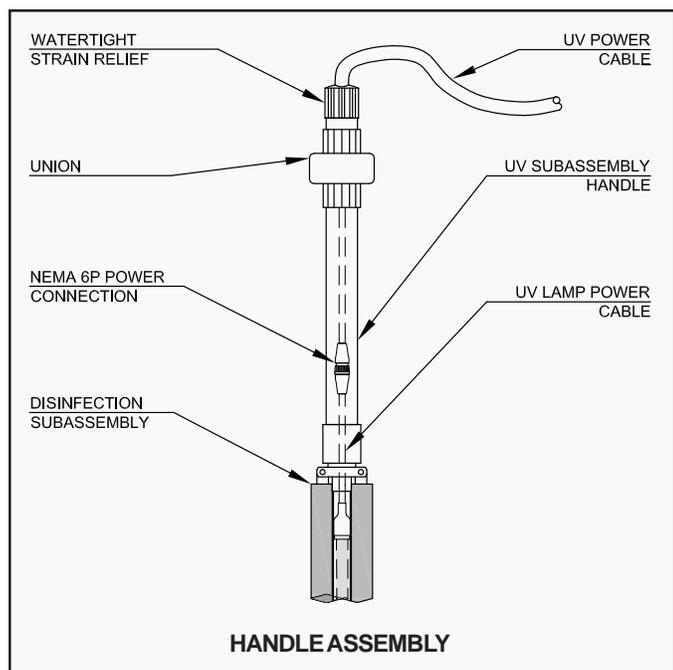
4. Solvent weld the effluent line of the upstream treatment system to the 4" inlet coupling of the Model AT 1500. Next, solvent weld the 4" outlet coupling to the final effluent line. Cover the open top of the disinfection chamber and backfill up to the bottom of the plumbing.

## ULTRAVIOLET DISINFECTION (Cont.)

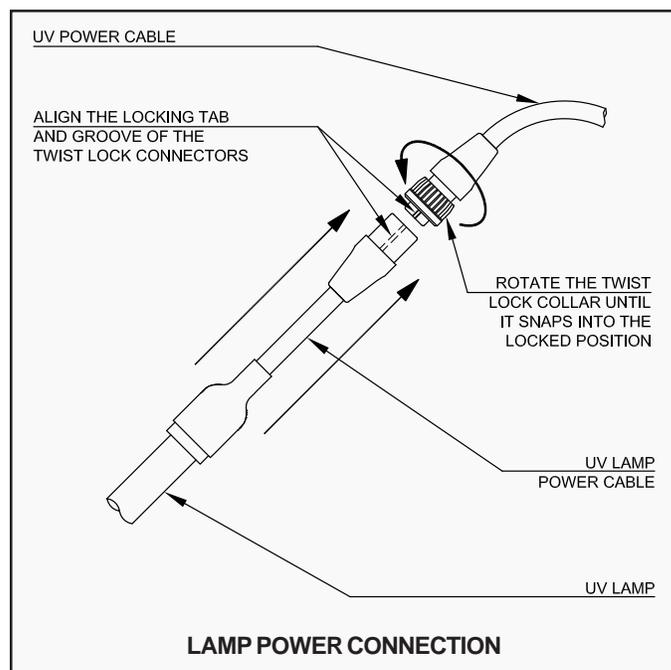
5. The control enclosure should be completely above grade in the finished installation. The riser pipe and UV handle are purposely manufactured longer than necessary and must be trimmed. Fit the riser pipe into the top of the disinfection chamber and mark a trim line on the **BOTTOM**. Mark the subassembly handle on **BOTTOM** to trim the same amount.



6. Use a hacksaw to cut along the trim line on both the riser pipe and handle to make them the proper length.  
 7. Solvent weld the riser pipe to the disinfection chamber.  
 8. Disassemble the union and set aside the top portion and UV power cable. Solvent weld the lower portion of the handle onto the UV system subassembly.  
 9. The Model AT 1500 is shipped with the UV power cable connected to the control enclosure. If this power cable



has become disconnected, it must be reconnected at this time. To do so, remove the gasketed cover from the control enclosure. Connect the lead labeled "1" on the UV power cable to the terminal block marked "1". Connect the lead labeled "2" on the cable to the terminal block marked "2". Connect the lead labeled "3" on the cable to the terminal block marked "3". Connect the yellow lead on the cable to the terminal marked "Y/G".



10. Remove the threaded access plug from the riser.  
 11. Align the locking tab and groove of the twist lock connectors on the UV lamp power cable and the UV power cord. Push the two connectors together until the male connector is fully seated in the female connector. Rotate the twist lock collar until it snaps into the locked position. Holding the lamp power cable, carefully insert the lamp through the handle and completely into the quartz sleeve of the UV subassembly.  
 12. Assemble and tighten the union in the handle to insure a watertight connection. Tighten the strain relief on the handle assembly.  
 13. Use water or glycerin to lubricate the rubber gaskets located on both sides of the UV subassembly.  
 14. Do not touch the Teflon sheath or allow excess glycerin to contact it. Use a clean, soft cloth and isopropyl alcohol to remove fingerprints or excess glycerin.  
 15. Fill the disinfection chamber with clean water.  
 16. Carefully insert the UV subassembly into the disinfection chamber. Insure the locating pins in the chamber lock into the openings on the subassembly.

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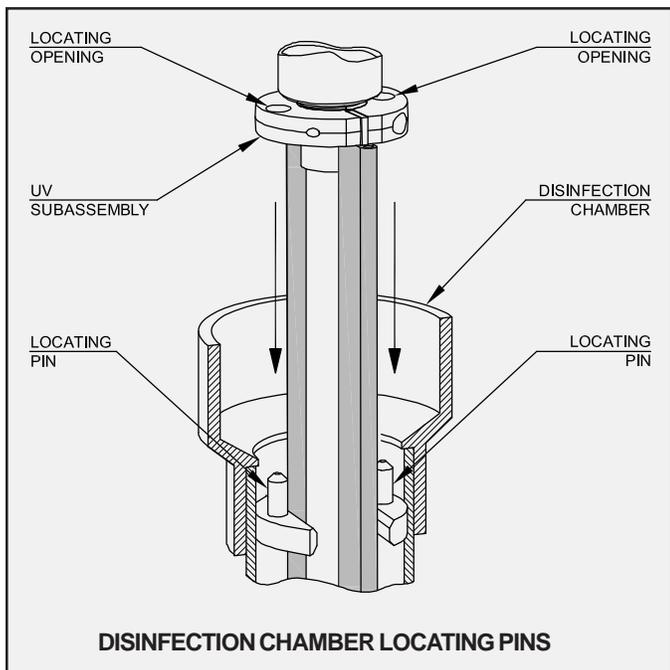
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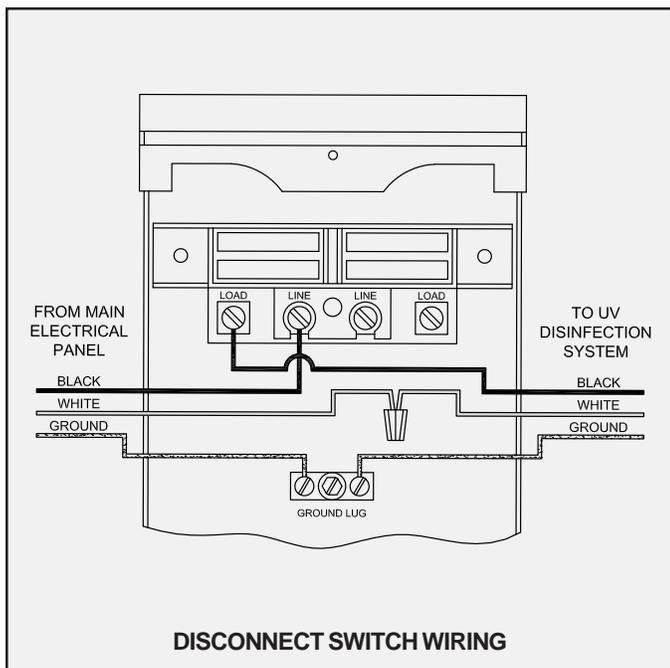
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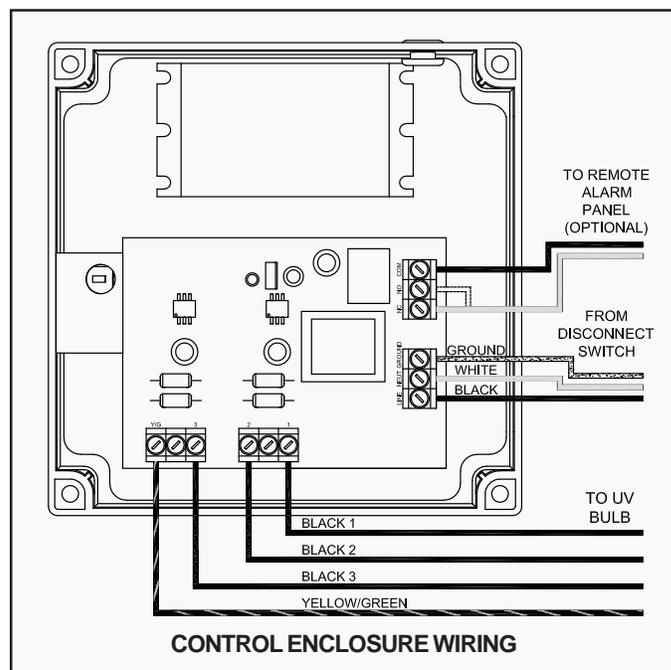
## ULTRAVIOLET DISINFECTION (Cont.)



17. Tuck the excess power cable into the riser pipe.
18. Use a dedicated 115 volt AC single phase 15 amp circuit in the main electrical panel for service to the UV disinfection system. **NOTE:** Make sure the breaker is "off" before proceeding.
19. A disconnect switch should be provided to de-energize power to the UV disinfection system during service. Mount the power disconnect switch enclosure to the facility being served.
20. Install a #14/2 AWG cable from the dedicated breaker in the main electrical panel to the disconnect switch.
21. In the disconnect switch enclosure, connect the hot (black) lead from the main electrical panel to the "Line" terminal. Connect the black lead to the UV system to the "Load" terminal. Twist both white leads together



22. Remove the control enclosure cover and black electrical insulator. Install a #14/2 AWG cable from the disconnect switch to the control enclosure. Insure the connection to the UV system is made in conduit with the conduit fittings provided. A watertight connection is critical to insure proper operation and safety.
23. Attach the incoming hot (black) lead to the terminal block marked "LINE" in the UV control enclosure. Attach the common (white) lead to the terminal block marked "NEUT" in the enclosure. Attach the incoming ground lead to the terminal block marked "GROUND" in the enclosure.
24. (Optional) If a remote alarm panel is required, the alarm leads should be installed in a separate conduit using the second conduit fitting provided. A watertight connection is critical to insure proper system operation and safety. Connect one alarm lead to either the normally open (NO) terminal or the normally closed (NC) terminal. Choose the correct terminal for the type of signal required by the remote alarm panel. Connect the other lead to the common (COM) terminal.
25. Solvent weld a plug into any unused conduit fittings to insure watertight integrity is maintained.
26. Apply thread sealant to the threaded access plug and install plug in the riser opening. Tighten to insure a watertight seal.
27. Secure the gasketed cover in place on the top of the control enclosure, using the four screws provided.



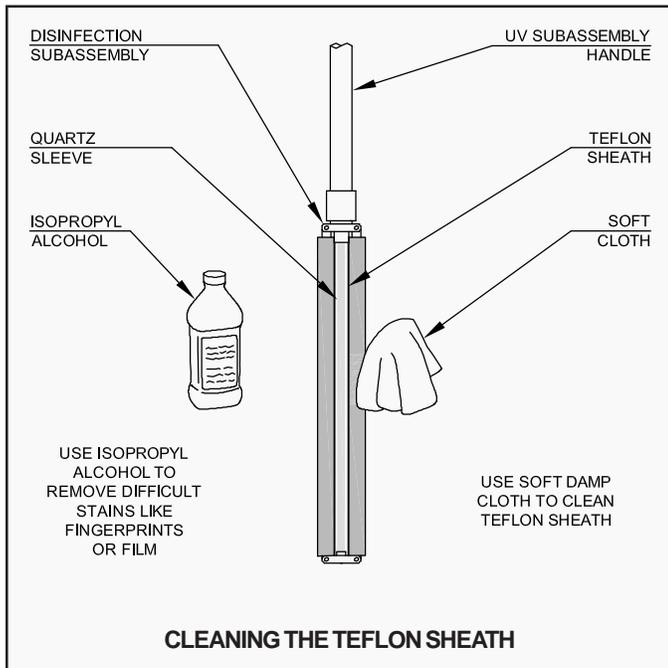
28. Backfill around the disinfection chamber and riser pipe. Finished grade should be below the control enclosure to prevent the entry of surface water.
29. Turn "on" the UV breaker in the main electrical panel.
30. Turn "on" the power at the disconnect switch.
31. The green light on the control enclosure should now be illuminated to indicate the system is operational.

# ULTRAVIOLET DISINFECTION (Cont.)

## MAINTENANCE AND SERVICE

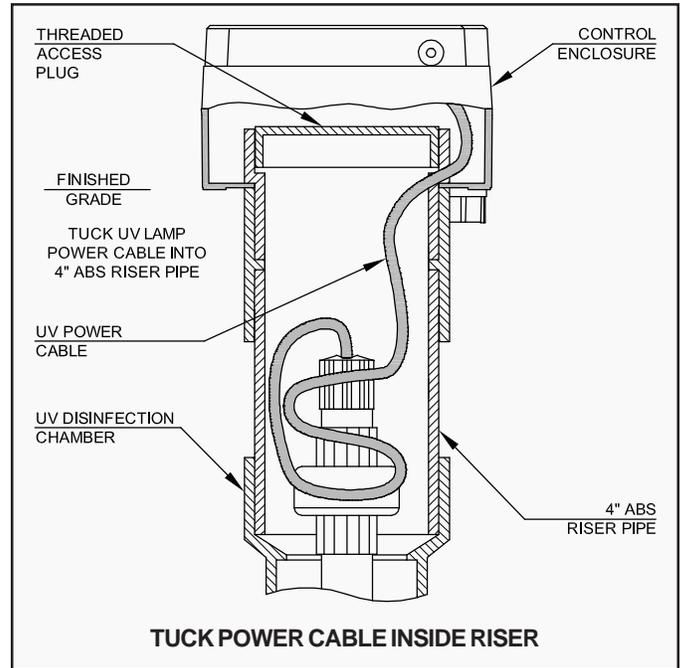
UV blocking protective eyewear must be worn during service or any time the bulb may be illuminated. It is recommended that the subassembly be removed and serviced every six months to insure proper disinfection. Inspect the Teflon sheath for damage or biological film. If the sheath is damaged or biological film is present between the sheath and the quartz sleeve, the subassembly must be replaced. Contact Norweco for replacement parts. If biological film is present on the surface of the Teflon sheath, the sheath must be cleaned to insure proper disinfection. To clean the Teflon sheath:

1. Insure power is turned off at the disconnect switch or in the main service panel.
2. Use a soft damp cloth to carefully wipe down the sheath.
3. Use isopropyl alcohol on a soft cloth to carefully remove difficult stains like fingerprints or biological film.



The system is designed to provide long service life. It is recommended that the UV lamp be replaced every two years to insure proper disinfection of the treatment system effluent. The green light on the side of the control enclosure will no longer illuminate when the lamp needs replaced. UV blocking protective eyewear must be worn during service or any time the bulb may be illuminated. To replace the lamp:

1. Turn off power to the UV system at the disconnect switch or in the main service panel. Confirm that the green indicator light on the side of the enclosure is "off".
2. Remove the control enclosure cover and threaded plug.
3. Remove the subassembly from the disinfection chamber and disassemble the union in the handle. Use the power cable to remove the UV lamp from the subassembly.
4. Disconnect the UV lamp power cable from the UV power cord by rotating the twist lock collar counter-clockwise a quarter turn.



5. Connect new lamp and carefully lower into the UV subassembly. Make sure the lamp is fully seated in the quartz sleeve.
6. Reassemble and tighten the union in the handle.
7. Lower the subassembly into the disinfection chamber.
8. Reinstall the threaded access plug onto the riser.
9. Reinstall the control enclosure cover and secure with the four screws provided.
10. Turn on power at the disconnect switch or main service panel. Verify that the green indicator light on the side of the control enclosure is illuminated.

**NOTE:** The UV lamp contains mercury which is harmful to the environment. Insure that old UV lamps are disposed of at a recycling center.

## ALARM CIRCUIT

The Model AT 1500 system is equipped with a current sensing circuit to monitor the UV lamp performance. If the UV lamp output drops below an acceptable level for proper disinfection, the alarm circuit will turn "off" the green indicator light on the enclosure. When connected to the Service Pro control center, the service provider can be immediately notified that maintenance to the UV system is required. For more information regarding connection of the Model AT 1500 UV disinfection system alarm to a Service Pro control center, please refer to the Service Pro Control Center with MCD Technology Installation and Operation Instructions.

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# SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

## TANK PUMPING INSTRUCTIONS

These instructions provide a general guideline concerning when and how to pump out the Singulair Green system. This literature supplements other instructional materials included in the Singulair Green Bio-Kinetic System Service Manual.

In order to maximize performance, protect system components and insure protection of the surrounding environment, the Singulair Green system should be thoroughly checked every six months by a factory-trained Norweco service technician. An initial service program that provides a minimum of four service inspections during the first two years of system operation is included in the system purchase price. Renewable service contracts to extend these routine inspections after the initial program expires are available from the local licensed Norweco dealer.

The pretreatment chamber of the Singulair Green system will periodically require pumping. Because the Singulair Green system is a biological treatment device, the time frames listed within these instructions are estimates. Actual pumping frequency will depend on the amount and strength of the wastewater being treated.

Handling and disposal of pretreatment chamber contents, referred to as septage, or the contents of the aeration and clarification chambers, referred to as biosolids, are regulated by local, state and federal authorities. Disposal options may include land application, lagoon treatment, municipal wastewater treatment or landfill disposal. Prior to arranging for tank pumping, contact the Norweco dealer to obtain complete information on access to chambers, removing equipment, coordination of services and disposal of tank contents.

During Singulair Green system installation and backfilling, do not allow dirt or mud to enter the system. Once in the system, dirt or mud will form a heavy sludge which will affect settling characteristics, interfere with filtration and degrade effluent quality. If dirt or mud enters the system, it must be removed to insure proper system operation. Removing the dirt or mud may require repeated flushing and tank pumping. For additional details refer to Singulair Green Tank Delivery and Setting instructions.

### INTRODUCTION

The Singulair Green system is a biological treatment device and should not require pumping as frequently as a septic tank. Septic tanks are designed to store solids and perform limited biological treatment. Frequent pumping of a septic tank is mandatory to remove and dispose of these solids before they discharge from the tank. The Singulair Green system is designed to biologically treat all incoming wastewater and return only a high quality effluent to the environment. The multiple operating processes contained within the plant accomplish primary, secondary and tertiary treatment in each Singulair Green system. The pretreatment chamber of the Singulair Green system is designed to retain non-biodegradable solids and allow biodegradable solids to flow into the aeration chamber. The aerobic treatment process in the Singulair Green system utilizes these biodegradable solids to convert the wastewater into carbon dioxide and water. This natural biological process minimizes the accumulation of solids and eliminates the need to pump the system as frequently as a septic tank. Because the Singulair Green system utilizes the biodegradable material found in wastewater to perform biological treatment, pumping the system more often than needed will not improve operational performance. Removal of the solids in the Singulair Green system will be required when indicated by an inspection or evaluation as outlined herein.

### WHEN TO PUMP

Norweco dealers provide maintenance and service inspections free of charge at regular six month intervals during the initial warranty period. These routine service inspections will determine if a pretreatment chamber evaluation is necessary. The pretreatment chamber should be evaluated by a factory-trained technician at least every three years to determine if pumping is required. Pumping of this chamber by a licensed tank pumping and disposal service will likely be necessary at 3 to 5 year intervals, based on variations in system occupancy, usage and loading.

### ROUTINE SERVICE INSPECTIONS

Semi-annual service inspection procedures are outlined in detail in the Singulair Green Bio-Kinetic System Service Manual. These routine service procedures include inspection of the aeration chamber, clarification chamber and effluent line to determine if the pretreatment chamber should be evaluated. A brief outline of these routine service procedures, as well as the detailed steps required to perform a comprehensive pretreatment chamber evaluation, are listed here. The results of the routine service inspection, pretreatment chamber evaluation and tank pumping (when performed) should be noted on the Service Inspection Card.

## AERATION CHAMBER INSPECTION

A summary of the aeration chamber inspection procedure is listed below. For complete details on aeration chamber service, refer to the Singulair Green Service Manual.

**CAUTION:** Any time an aerator or service pump is connected or disconnected, first shut off the selector switch in the Service Pro control center. Failure to do so could result in personal injury or equipment damage.

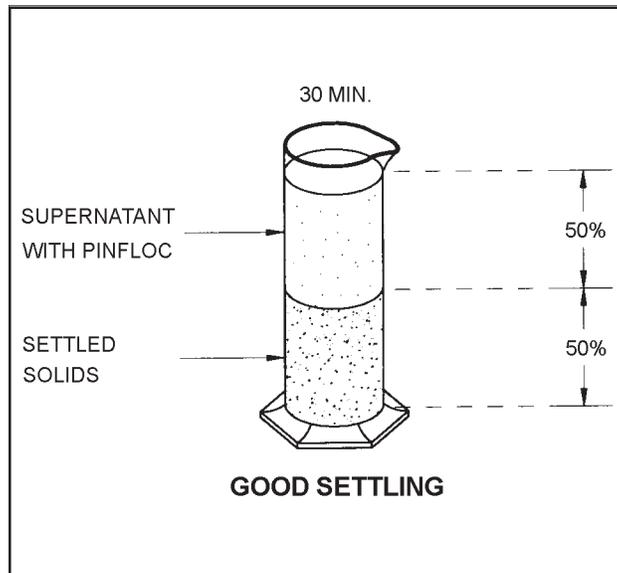
1. Remove the vented aeration chamber access cover and set aside.
2. Unplug the aerator and secure the closure cap in position to protect the electrical connector.
3. Lift the aerator straight up out of the aeration chamber access opening and lay it flat on the vented cover. DO NOT bump the aspirator shaft or rest the aerator on the aspirator shaft.
4. Perform a settleable solids test using a graduated cone or other clear container. For this test, make sure the aerator has been running for at least 10 minutes. Collect an aeration chamber sample immediately after turning off and removing the aerator. Refer to the "Settleable Solids Test" section of these instructions for additional details.
5. Loosen the two set screws on the bottom of the intermediate shaft and remove the aspirator shaft.
6. Connect the aspirator shaft to the shaft cleaning hose and outside water faucet to flush the inside of the aspirator shaft clean. Use full water pressure. Remove the aspirator shaft from the cleaning hose and inspect the bore to see that it is clean.
7. Visually check the aeration chamber surface for the presence of grease or oil. An accumulation of these materials indicates the pretreatment chamber should be evaluated.
8. Check the aeration chamber contents for the presence of non-biodegradable materials, paper, mop fibers, hair, grease or oil. A significant accumulation of these materials in the aeration chamber indicates the pretreatment chamber should be evaluated.

**NOTE:** Do not replace the aerator until the Bio-Kinetic system has been removed from the clarification chamber and properly serviced.

## SETTLEABLE SOLIDS TEST

A settleable solids test should be conducted as part of the aeration chamber evaluation during each routine service inspection to monitor system performance. The results of the settleable solids test can be used to verify that a mature biomass has developed in the Singulair Green system. The test will also indicate when excessive solids have accumulated in the pretreatment chamber of the Singulair Green system. When this occurs, it may be necessary to pump the contents of the pretreatment chamber.

To insure a well mixed sample is collected for the settleable solids test, make sure the aerator has been running for at least 10 minutes. Collect the sample immediately after turning off and removing the aerator and before the aeration chamber contents begin to settle. Using a graduated cone or other clear container, dip the container into the aeration chamber to a depth of 2<sup>1</sup>/<sub>2</sub> feet. Set the container on a level surface and allow the solids to "settle" for 30 minutes while you complete the service inspection. Do not disturb the container during the test.



After 30 minutes, read the level of solids and compare it with the total liquid volume in the container. Calculate the percentage of settled solids volume (i.e. <sup>1</sup>/<sub>2</sub> full of solids equals 50%). If the settled material contains large pockets of clear liquid, estimate the volume of these pockets and reduce the settled solids reading by that amount. A settled solids reading of up to 75% indicates no adjustments are necessary.

**NOTE:** The solids should settle and compact within the 30 minute test. System start-up, or periods of low organic loading will result in solids that are too light to settle, and will appear as a full container with no clear separation. This should not be interpreted as having excess solids and system operation can continue without any adjustment.

A settled solids level greater than 75% at the end of the 30 minute test indicates excessive solids in the aeration chamber and that the pretreatment chamber may need to be pumped. In this case, a pretreatment chamber evaluation must be performed. Refer to the "Pretreatment Chamber Evaluation" section of these instructions for more details. If the pretreatment chamber evaluation indicates pumping is not required, the aerator operating cycle may need to be increased. Consult the local regulatory agency and the Service Pro Time Clock Setting instructions before adjusting the aerator operating cycle.

The results of the settleable solids test, and any adjustment made to the system time cycle, should be recorded on the Service Inspection Card.

## CLARIFICATION CHAMBER INSPECTION

*A summary of the clarification chamber and Bio-Kinetic service inspection procedure is listed below. For complete details on clarification chamber service, refer to the Singulair Green Bio-Kinetic System Service Manual.*

1. Remove the clarification chamber access cover.
2. Install the outlet sealing tool into the receiving flange to prevent loss of liquid from the Singulair Green system during service.
3. Remove the Singulair aerator and place the service funnel over the aerator mounting riser.
4. Using the universal tool, remove the flow deck and chamber plate assembly from the Bio-Kinetic system. Place the assembly on the service funnel for cleaning.
5. Using the universal tool, disengage all four black locking lugs to allow for removal of the outer chamber.
6. Lower the fixed handle of the universal tool into the upper lip of the Bio-Kinetic system outer chamber. Turn the handle until the lifting tool is engaged into the lifting rib.
7. The outer chamber is equipped with a drain valve and fill valve to allow for easy removal and reinstallation during service. Begin lifting the outer chamber from the tank. The drain valve will automatically open as the outer chamber is lifted out of the clarification chamber. Remove the outer chamber from the mounting riser and set it on the upside down lid of the service container.
8. Reinstall the Singulair aerator as outlined in the Singulair Green Aerator Service Instructions. The aerator must be in operation while the remaining clarification chamber service is performed. The aerator works in conjunction with the Bio-Static sludge return to create a hydraulic current that will return settled solids to the aeration chamber.
9. Check the surface of the clarification chamber for the presence of grease or biologically untreatable material. A significant accumulation of these materials would indicate that the pretreatment chamber should be evaluated.
10. With the aerator running, use the hopper scraping tool to gently scrape all areas of the clarification chamber hopper side walls.
11. Complete the clarification chamber service as outlined in the "Clarification Chamber" section of the Singulair Green Bio-Kinetic System Service Manual.
12. Make appropriate notations on the Singulair Service Inspection Card and on the Owner's Manual.

## PRETREATMENT CHAMBER EVALUATION

The pretreatment chamber must be evaluated within three years of system start-up or the most recent tank pumping. An evaluation must also take place any time a routine service inspection indicates the chamber may be discharging excessive solids. This evaluation includes measuring the depth of the floating scum and settled sludge layers to determine if pumping is required. If the pretreatment chamber evaluation indicates the chamber does not require pumping, these evaluations should be repeated annually until pumping is necessary.

## PRETREATMENT CHAMBER INSPECTION

*A complete pretreatment chamber inspection procedure is listed below. The results of the inspection should be noted on the Service Inspection Card.*

1. Remove the access cover and be careful not to allow dirt or mud to enter the tank. If dirt or mud enters the system, it must be removed to insure proper system operation.
2. Visually examine the surface of the pretreatment chamber for a significant accumulation of grease, oil or non-biodegradable materials.
3. Using the hopper scraping tool, gently probe the surface of the chamber to determine the thickness of the scum mat. Force the tool down through the scum mat, rotate the tool one quarter turn, then raise it until the bottom of the mat is felt. If the depth of the floating scum layer has reached the bottom of the discharge tee, the chamber should be pumped.
4. To check the depth of the settled sludge layer, secure a rough white towel to the handle of the hopper scraping tool and lower it to the bottom of the chamber.

Push the tool through the settled sludge layer to the bottom of the tank. Wait several minutes and carefully remove the tool. The depth of the settled sludge layer will be shown by a dark line on the towel. If the settled sludge layer has accumulated to the bottom of the discharge tee, the chamber should be pumped.

Review the “Operational Requirements” section of the Owner’s Manual with the owner. If lint, grease, scouring pads, diapers, sanitary napkins, cotton balls, cotton swabs, cleaning rags, dental floss, strings, cigarette filters, rubber or plastic products, paints, thinning agents or other harsh chemicals are discovered in the system, the owner should be cautioned regarding proper use of the system.

## WHAT TO PUMP

When pumping is required, normally it is necessary to pump only the pretreatment chamber if the system has been serviced at regular 6-month intervals. If service has been interrupted for an extended period of time, or if mud or toxic material is present, it may be necessary to pump out the entire system. When pumping, it is not necessary to wash down the compartments unless significant quantities of grease, hair, fibers, mud, toxic substances or biologically untreatable materials are present. The capacity of the pretreatment chamber is 450 gallons. When pumping the pretreatment chamber, an additional 400 gallons will be removed from the aeration and clarification chambers until the liquid level drops below the transfer port invert. A total of 850 gallons will be removed when the pretreatment chamber is pumped. The total capacity of the system is 1,300 gallons.

**CAUTION:** After pumping any portion of the Singulair Green tank, it is essential to immediately refill each chamber with clear water to the design flow line. The water must be free of leaves, mud, grit or other materials that might interfere with system operation. Dewatering and leaving the system empty will affect tank integrity and void the warranty.

## HOW TO PUMP THE SYSTEM

*A complete Singulair Green system pumping procedure is listed below. Prior to pumping, contact the Singulair Green dealer to obtain complete information on equipment removal and reinstallation. Failure to properly remove and reinstall equipment and access covers during tank pumping may result in damage to the system and will void the warranty.*

1. If any portion of the Singulair Green system requires pumping, contact a tank pumping service licensed by the local regulatory agency. The septage or biosolids must be removed and disposed of in a manner consistent with federal, state and local regulations.
2. Advise the pumping service what volume of liquid is to be removed from the system.

3. For pumping the pretreatment chamber only, remove all three access covers and insert a suction hose into the pretreatment chamber. Lower the hose until it contacts the bottom of the tank. Withdraw the hose approximately 2" and connect the opposite end to the pump being used to evacuate the chamber. Do not allow the hose to rest on the bottom of the tank.
4. Break up the scum mat to facilitate pumping. Activate the pump and remove the pretreatment chamber contents. It is not necessary to wash down the sidewalls or tank bottom.
5. If the solids in the chamber are so concentrated that the suction hose cannot withdraw them, the pretreatment chamber contents may be back-flushed to break up the solid matter.
6. If special circumstances require the total system to be pumped, contact the local Singulair Green dealer. The aerator and Bio-Kinetic system must be removed for full access to all chambers and to prevent damage to components. Only the factory trained Singulair Green dealer should attempt to remove and reinstall the equipment.

**NOTE:** Access to the contents of the aeration and clarification chambers of Singulair Green systems should be made only through an aerator mounting riser. Never insert the hose through the Bio-Kinetic system mounting riser.

7. A Singulair Green system that has been inactive for an extended period of time or that has accumulated mud or dirt during installation may have to be washed down with fresh water and pumped out. This process may have to be repeated for proper system operation.
8. After pumping, fill all chambers to capacity with water. Return the aerator, Bio-Kinetic system and all access covers to their proper locations, as outlined in the Singulair Green Service Manual. Be sure each control center selector switch is in the “on” position, and each enclosure is secured with a tamper evident seal.

*Following tank pumping, no other system adjustments are necessary for proper biological treatment to continue. Semi-annual service inspections by a factory-trained Norweco service technician should be conducted to insure long term system performance.*

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# ***norweco***® **SINGULAIR**®

## BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

### STATE OF OREGON SERVICE CONTRACT

This two year service contract has been developed for Singulair Bio-Kinetic wastewater treatment systems installed within the State of Oregon. This service contract is intended to enable the owner to economically obtain regular service inspections for the Singulair unit, as well as non-scheduled or emergency service that may be required by a qualified service provider. When this contract is in force, the owner will not be charged for any routine service labor. Under the terms of this service contract, a service provider will regularly inspect the plant at six month intervals. This service contract shall remain in effect for a period of two years, as specified in the effective and expiration dates, unless otherwise terminated or cancelled by either party provided herein.

#### SINGULAIR SYSTEM CUSTOMER

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

#### SINGULAIR SYSTEM LOCATION

Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Legal Description: \_\_\_\_\_

System Installation Date: \_\_\_\_\_

Effective Date: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

#### SINGULAIR SYSTEM SERVICE PROVIDER

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

#### REGULATORY CONTACT INFORMATION

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

Now, therefore, in consideration of the terms, provisions, covenants and conditions contained herein, the parties hereto agree as follows:

#### PERFORMANCE OF SERVICES

The authorized Singulair service provider shall perform system inspection/service visits during the two year period after installation, as shown in the diagram:

#### Inspection / Service Visits<sup>1</sup>

3 to 6 months \_\_\_\_\_

6 to 12 months \_\_\_\_\_

12 to 18 months \_\_\_\_\_

18 to 24 months \_\_\_\_\_

#### Alarm Response Other Services<sup>2</sup>

System Monitoring \_\_\_\_\_

Reporting \_\_\_\_\_

<sup>1</sup>As required by NSF International, these services will be included as part of the initial purchase of the system for the first two years of system operation.

<sup>2</sup>These services may be paid for during purchase or at a later date, when the work is performed.

#### SERVICE PERFORMANCE RECORD

These services shall be performed during normal business hours Monday through Friday (excluding national holidays) on a prescheduled basis and as the authorized Singulair service provider deems necessary or advisable.

At each service visit, the Singulair system shall be inspected and serviced in accordance with the instructions in the Singulair Service Manual. Additionally, an effluent quality inspection consisting of a visual assessment of color, turbidity and scum overflow and an olfactory assessment for odor shall be performed.

# STATE OF OREGON SERVICE CONTRACT (Cont.)

The service provider shall provide emergency service within 48 hours of a service request. The service provider shall also be responsible for submitting the annual report and annual evaluation fee to the appropriate regulatory agency as required in OAR-071-0345.

The Singulair service provider shall notify the owner in writing if any improper system operation cannot be remedied at the time of servicing. The written notification shall include an estimated date of correction.

## DEFINITIONS

For purposes of this service contract, the following definitions shall apply:

“System Monitoring” - shall include the collecting and processing of data transmitted by telemetry, PDA, laptop computer or other for evaluating the operating parameters of the treatment system, including alarm notification. It shall also include all sampling and laboratory information.

“System” - shall mean a Singulair Bio-Kinetic wastewater treatment system.

“System Start-Up Date” - shall mean the date the Singulair system begins operating for its intended purpose.

## CHARGES

Basic services, including service, inspection, effluent quality evaluation and service shall be included with the purchase of the Singulair system. Optional, additional services shall be provided at the agreed upon contract price and terms. The annual report and annual evaluation fee required by DEQ is not optional and may or may not be included in the cost of basic services. Refer to the service provider’s fee schedule for an outline of the cost of basic services and optional services to be provided under this contract.

## WARRANTY

The Singulair service provider warrants that all services shall be performed in a good and workmanlike manner and that the service provider will correct any Singulair system errors, malfunctions or defects directly caused by the service provider’s failure to perform the services and additional services in such manner.

## LIMITATION OF LIABILITY

The sole liability of the Singulair service provider under this agreement shall be to correct any errors, malfunctions or defects in the system directly caused by the Singulair service provider’s failure to perform any services in a good and workmanlike manner pursuant to the charges outlined above. In no event shall the service provider’s liability to the customer hereunder exceed the total of the amounts paid to the service provider hereunder by the customer. In no event shall the Singulair service provider be liable to the customer or any third party claimant for any indirect, special, punitive, consequential or incidental damages or lost profits arising

out of or related to this service contract or the performance or breach thereof, whether based upon a claim or action of contract, warranty, negligence or strict liability or other tort, breach of any statutory duty, indemnity or contribution or otherwise, even if the service provider has been advised of the possibility of such damages.

## SERVICE CONTRACT TERMINATION/CANCELLATION

Service contracts may be terminated or cancelled only upon:

- Written notice by one party effective as of the effective date thereof if the other party is in default of any provision of this agreement and such default is not cured by the defaulting party within fifteen (15) days after the effective date of said notice from the non-defaulting party or by the mutual written agreement of both parties.
- Copy of such written notice shall be forwarded to the regulatory agency.

## MISCELLANEOUS PROVISIONS

This agreement is personal in nature and may not be delegated, assigned or transferred by either party without prior written consent of the other party. The laws of the State of Oregon shall govern this agreement.

The homeowner shall be responsible for complying with the Singulair Owner’s Manual provided to them with the purchase of the system.

Any notice or other communication required or permitted to be given under this agreement shall be in writing and shall be mailed by certified mail, return receipt requested, postage prepaid, addressed to the parties at the addresses shown on the first page of this contract. Any notice or other communication shall be deemed given at the expiration of the second day after the date of deposit in the United States mail. These addresses to which notices or other communications shall be mailed may be changed from time to time by giving written notice to the other party as provided in this section.

## SINGULAIR SYSTEM PROVIDER

Name/Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## SINGULAIR SYSTEM CUSTOMER

Name/Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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## SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

# SINGULAIR® AERATOR INSTALLATION

Installation of the aerator and Bio-Kinetic system should take place when the Singulair Green system is ready for start-up. Refer to the Bio-Kinetic System Installation instructions for additional details regarding the installation of the Bio-Kinetic system. Your delivery truck driver should have instructed the contractor or owner to contact your office and make arrangements for equipment installation to occur after the home is occupied and the sanitary sewer is in use. Review your Singulair Green tank setting records weekly to insure that you do not have equipment installations that are overdue. If you suspect that adequate time has passed for system start-up and you have not yet heard from the owners, contact them to schedule equipment installation.

### PRE-INSTALLATION CHECKLIST

- ✓ The installer should have accurate directions to the facility and a list of service inspections due at other installations in the vicinity.
- ✓ The service vehicle should carry the Singulair Tool Kaddy fully stocked with tools, spare parts and test equipment for use during installation.
- ✓ The installer should have the Singulair Green Installation Manual.
- ✓ Someone should be present at the location to allow installer access to the control center and electrical service panel.
- ✓ The main electrical service panel wiring must be complete so the aerator may be started-up and tested.
- ✓ All chambers of the Singulair Green tankage should be full to the flow line.
- ✓ The installer must have the proper model aerator for the installation.
- ✓ The serial number on the aerator must match the service and warranty record card.

### AERATOR START-UP PROCEDURE

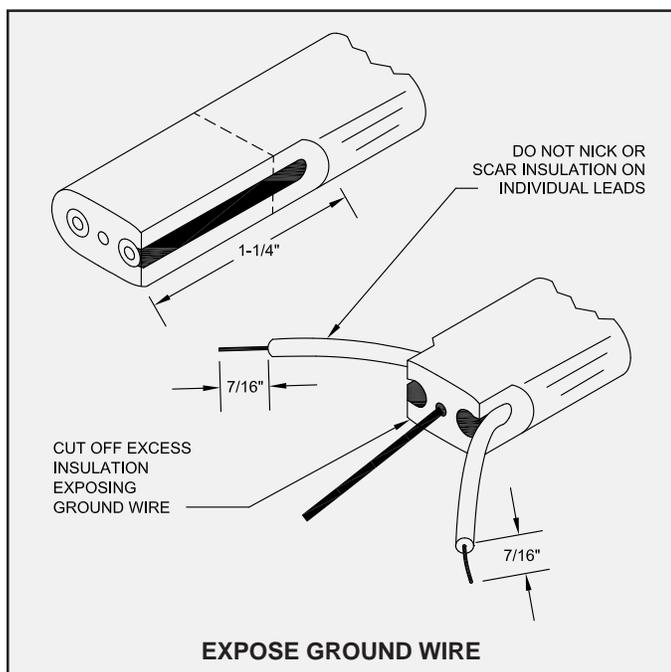
When you arrive on site, introduce yourself to the owner and ask to see the main electrical service panel and Service Pro control center. Be certain the circuit for the Singulair Green system in the main electrical service panel is de-energized and that the selector switch in the Service Pro control center is placed in the "off" position. Explain to the owner that you will be installing the aerator into the aeration chamber of the tank and you will need access to the main electrical service panel for system start-up after the aerator has been installed. Carry the aerator in its shipping carton to the tank site. Place the Singulair Tool Kaddy nearby for easy access to tools and test equipment. Remove the vented cover from the aerator mounting riser. Carefully remove the aspirator shaft from the shipping carton. Do not bump or bend the aspirator shaft. Lay the shaft on the vented cover. Grip the outside bottom of the shipping carton with your feet and lift the aerator to remove it. Lay the aerator on its side with the brackets resting on the vented cover near the aerator mounting riser. Uncoil the underground electrical service cable from inside the aerator mounting riser and extend it out of the riser. Test the exposed leads with the electrical multi-meter from the Tool Kaddy before proceeding. The circuit should not be energized and voltage should not be evident when the leads are tested with the multi-meter.

### WIRING THE ELECTRICAL CONNECTOR

The moisture resistant electrical connector must be properly wired to insure system operation and protect components. Carefully follow these steps to completely wire the electrical connector:

1. Uncouple the two halves of the electrical connector on the Singulair aerator. Unscrew the three captive stainless steel screws from the face of the female half of the assembly. They will stay in the body of the receptacle. Lift out the rigid internal receptacle body.
2. Unscrew the compression nut on the strain relief connector assembly at the small end of the female half of the connector. Do not misplace the compression ring. Insert the electrical service cable through the compression nut, compression ring and neoprene grommet, which is contained in the molded plastic sleeve of the female connector.
3. Strip the outer insulation back 1 1/4" on the underground electrical service cable and expose the three individual leads. Use extreme care to be sure the insulation jackets on the individual black and white leads are not scarred or damaged while stripping the outer jacket. Check them carefully. If even slight damage is noticed, cut off the end of the cable just below your work and begin again.

## AERATOR INSTALLATION (Cont.)



- Strip off the insulation jackets  $\frac{7}{16}$ " from the ends of the black and white leads.
- Insert the black lead end of the electrical cable into the hole adjacent to the brass-colored screw and tighten the screw securely.
- Insert the white lead end of the electrical cable into the hole adjacent to the silver-colored screw and tighten the screw securely.
- Insert the bare copper ground lead into the hole that is adjacent to the green colored screw and tighten the screw securely.
- Inspect your work to see that no two uninsulated leads are in contact with each other and that all screws are tight. Also be sure the wire insulation is not captured in the terminal. All power cable leads must be connected to the correct terminals in the female receptacle for proper aerator operation. The back of the insert body is clear, making it easy to verify that each wire is in place before tightening the terminal screws. Improper wiring or electrical hook-up will void the warranty.
- Locate the insert key above the grounding pole on the side of the rigid receptacle body and align it with the keyway molded on the inside of the rubber receptacle sleeve. Grasp the connector and insert the receptacle body fully into the sleeve.
- Engage the three captive stainless steel screws on the face of the receptacle body and tighten them.
- Press the neoprene grommet onto the small end of the female half of the electrical connector. Tighten the compression nut and clear plastic compression ring against the grommet. The compression nut achieves maximum torque by hand-tightening. Do not over-tighten the compression nut.

**NOTE:** Any time the female connector is not in use, secure the closure cap in the end of the receptacle.

### ASPIRATOR SHAFT INSTALLATION

Each Singulair aerator is manufactured and tested to a critical straightness tolerance from the aerator motor to the aspirator. Remember that the operating life of the aerator often depends on the straightness of the aspirator shaft. It must not be bumped or allowed to contact anything except the aeration tank liquid.

- With the Singulair aerator lying on its side and the brackets propped up on the vented cover, rotate the foam restrictor until the stainless steel set screws in the intermediate shaft are facing up.
- Loosen the two set screws that are located closest to the foam restrictor.
- Examine the upper end of the aspirator shaft and locate the alignment mark permanently affixed during factory testing. Insert the aspirator shaft into the intermediate shaft so that the alignment mark on the aspirator shaft meets the corresponding mark on the intermediate shaft. Be sure both set screws have been loosened before inserting the aspirator shaft. The aspirator shaft must be fully inserted to the depth of the stop shoulder that has been machined in the outside of the aspirator shaft. Use a tee-handle allen wrench to tighten both set screws finger tight only. Overtightening may dish the side of the aspirator shaft and compromise the straightness tolerance.

### INSTALLATION IN THE MOUNTING RISER

- Lower the aerator into the aerator mounting riser carefully to avoid any contact between the aspirator shaft, aspirator tip and tank side walls.
- Make sure that the weight of the aerator is evenly distributed on all four mounting brackets and that the brackets are seated in the four grooves on the top of the aerator mounting riser.
- Arrange the underground power cable in the mounting riser so that it does not touch or come into contact with the side of the Singulair aerator.
- Make sure the blades on the male half of the electrical connector are clean and dry. Plug the two halves of the watertight electrical connector together making sure the multiple lip seal is securely engaged. Arrange the aerator power cord, electrical connector and underground electrical cable around the aerator, and secure them into the mounting clips attached to the aerator upper brackets. Before replacing the aerator mounting riser lid, make sure these electrical connections are not resting against the top of the aerator.

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# SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

## INSTALLATION OF THE BIO-KINETIC® SYSTEM

Installation of the aerator and Bio-Kinetic system should take place when the Singulair Green system is ready for start-up. Refer to the Bio-Kinetic System Installation instructions for additional details regarding the installation of the Bio-Kinetic system. Your delivery truck driver should have instructed the contractor or owner to contact your office and make arrangements for equipment installation to occur after the home is occupied and the sanitary sewer is in use.

The Bio-Kinetic system is installed in the final clarification chamber of the Singulair Green tank. This unique device accomplishes tertiary treatment, flow equalization and, if required by local regulations, effluent disinfection and dechlorination in one compact assembly. The Bio-Kinetic system is recommended for use in direct off-lot discharge applications and any other application where extremely high quality effluent is desirable. Installation of the Bio-Kinetic system can take place as soon as the tank is ready for storage or immediately after the tank is installed in a prepared excavation.

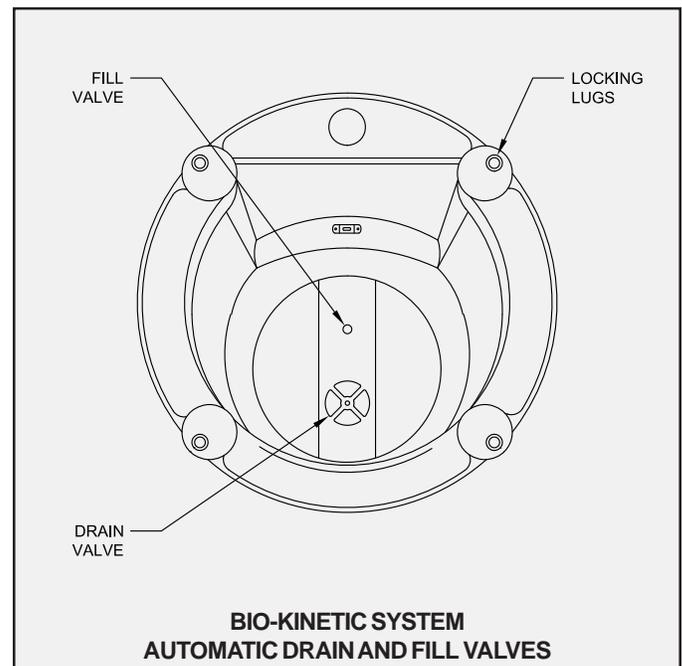
Drain and fill valves built into the Bio-Kinetic system allow it to be installed within the Singulair Green tank any time before or after the tank has been set. This allows faster Singulair Green system installation and less time at the installation site. When installing the Bio-Kinetic system before tank delivery, make sure the tank is stored in a level position to avoid stress on the receiving flange, the Bio-Kinetic discharge flange or to prevent damage to the outer chamber filter media.

### BIO-KINETIC® SYSTEM PRE-INSTALLATION CHECKLIST

- ✓ All chambers of the Singulair Green tank should be full to the flow line with clean hold down water as soon as the tank is placed in the excavation and backfilling is complete. When the owner calls for start-up, ask him to check the liquid level in the Singulair Green system. If the liquid level has not reached the outlet invert, have the owner add clean water until full.
- ✓ The service vehicle should be fully stocked, including the Singulair Tool Kaddy, Bio-Kinetic lubricant, Blue Crystal disinfecting tablets and Bio-Neutralizer dechlorination tablets.
- ✓ Make sure the proper model of Bio-Kinetic system for the installation is in the service vehicle. The Bio-Kinetic system may be supplied with or without Blue Crystal and Bio-Neutralizer chemical feed systems. Therefore, check your order and Distributor Service and Warranty Record Card carefully to be sure you have selected the proper Bio-Kinetic system with the correct service cover, flow distribution deck and feed tube(s) and that it is properly labeled for the correct model Singulair Green system.

### PREPARING THE SINGULAIR GREEN TANK

1. The Bio-Kinetic system mounting riser should be used for access to the clarification chamber. Additional extension risers may be added as necessary to reach finished grade.
2. The Bio-Kinetic system should only be installed in a mounting riser with a sealed access cover above it. All mounting risers and covers must be in place before backfilling the tank to prevent fill material from entering the Singulair Green tank. The top of each access cover must be located 3" to 6" above finished grade. Check to be sure that a pretreatment tee is installed in the opening in the pretreatment/aeration chamber wall.
3. Check to be sure that a Bio-Static sludge return is properly installed in the opening in the aeration/clarification chamber wall.
4. The Singulair Green tank should be filled with clean water. The water should be free of dirt, mud, leaves, grit, oils or other materials that might possibly interfere with operation of the system. The tank should be filled with



## INSTALLATION THE OF BIO-KINETIC® SYSTEM (Cont.)

water immediately after backfilling has been completed to prevent damage to the Singulair Green tank. The aeration and clarification chambers will both be filled if the hose is installed in the aeration chamber access opening. The pretreatment chamber should be filled separately through its access opening.

5. Influent and effluent sewer lines must be installed and connected to the system as soon as it is set and before backfilling to prevent entry of mud or debris. Follow the procedures outlined in the Singulair Green Tank Delivery and Setting instructions when backfilling the installation. Failure to follow proper backfilling procedure may result in damage to the tank and will void the Singulair Green warranty.
6. When a Singular Green system is being installed to replace a failed onsite wastewater treatment system, the old septic tank need not be abandoned. However, be sure the Singulair Green system is installed downstream of the old septic tank and that the entire obsolete system is completely pumped and cleaned before the Singulair Green tank is installed. If the owner prefers, the obsolete system may be totally removed or filled in and abandoned in the ground.
7. Check to see that roofing down spouts, footer drains, sump pump piping or garage and basement floor drains are not connected to the sanitary sewer. The Singulair Green system may not operate properly if hydraulic flows greatly exceed the rated treatment capacity. If the facility is equipped with a water softener, locate the backwash discharge line. The backwash line must not be connected to the Singulair Green system.

### BIO-KINETIC SYSTEM INSTALLATION PROCEDURE

Remove the Bio-Kinetic system from the shipping carton. Lift off the Bio-Kinetic system service cover and set it aside. Use the disassembly tool to remove the internal components and discard the shipping sleeve. Reinstall the internal components. Rotate the round, black locking lugs inward to allow installation.

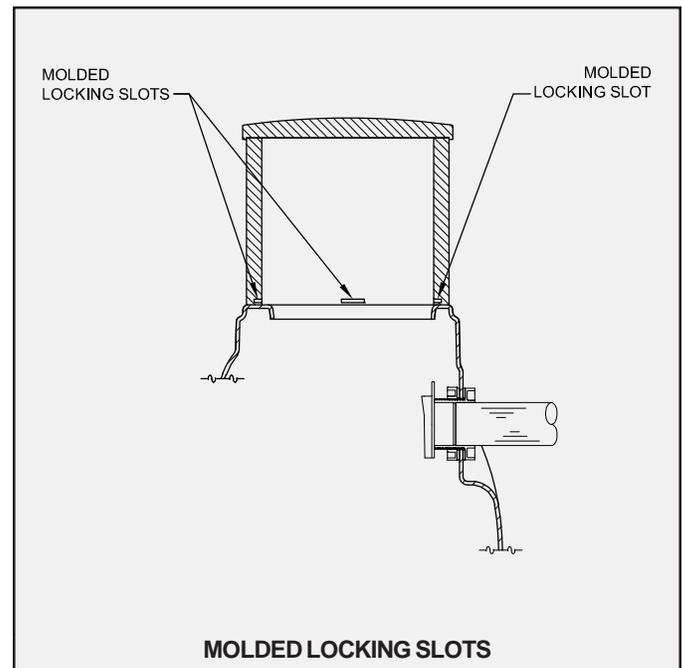
The Bio-Kinetic system discharge flange must engage the plastic receiving flange that has been installed in the outlet of the Singulair Green tank. Carefully examine the condition of the outlet coupling and receiving flange. Any residue or debris that has accumulated in the grooves of the receiving flange must be removed and the grooves and face of the receiving flange should be wiped clean. Use the swab tool to apply a liberal amount of Bio-Kinetic lubricant to the entire face of the receiving flange and the inside of the grooves. Apply the lubricant evenly until all interior surfaces of the receiving flange and the grooves are thoroughly coated. Locate the gasketed discharge flange assembly installed in the outlet of the Bio-Kinetic system. Check to make sure that the assembly is tight and fully engages the discharge opening of the Bio-Kinetic system. Using the swab tool, apply a liberal amount of lubricant to the exterior surfaces of the gasketed discharge flange. Apply the lubricant evenly

over the entire face of both sides and along the edges of the discharge flange.

**CAUTION: Bio-Kinetic lubricant has been specially formulated. Use of other lubricants, especially petroleum based lubricants, can cause degradation of the rubber components and will void the warranty.**

### SELF FILL VALVE

Use the lifting tool to lower the Bio-Kinetic system into the mounting riser. Be careful to align the discharge flange with the receiving flange that is installed in the outlet of the



tank. The Bio-Kinetic system is equipped with a pressure sensitive valve to aid in the filling process for new systems that are not yet filled and the draining process during service or removal. The fill valve is engineered to open when the pressure outside the Bio-Kinetic system reaches 16 inches of head. When the tank water level reaches 16 inches on the outer chamber of an empty Bio-Kinetic system, the fill valve will open. The valve will remain open until the water level inside the filter reaches 4 inches below the water level outside the filter. At this point, the valve will close. For operation instructions on the drain valve system, refer to "Clarification Chamber and Bio-Kinetic Service." Carefully guide the system through the center of the opening using the lifting tool. Be sure to maintain the Bio-Kinetic system

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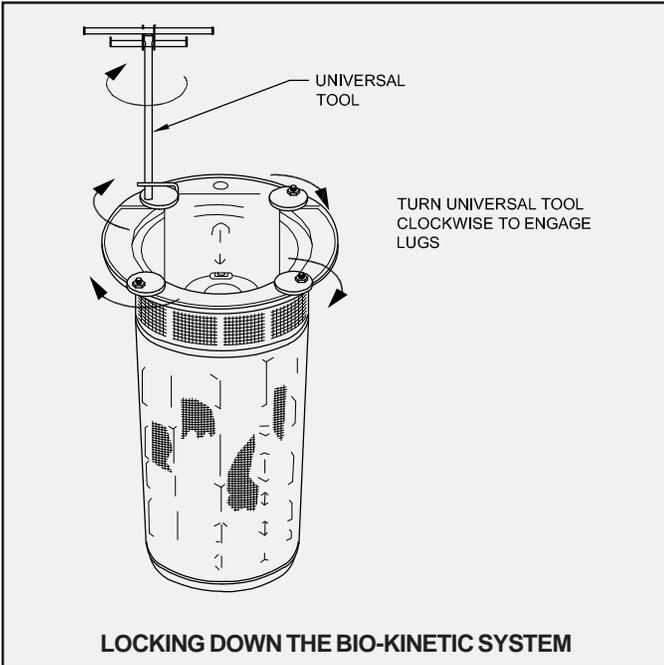
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# SINGLAIR GREEN® BIO-KINETIC®

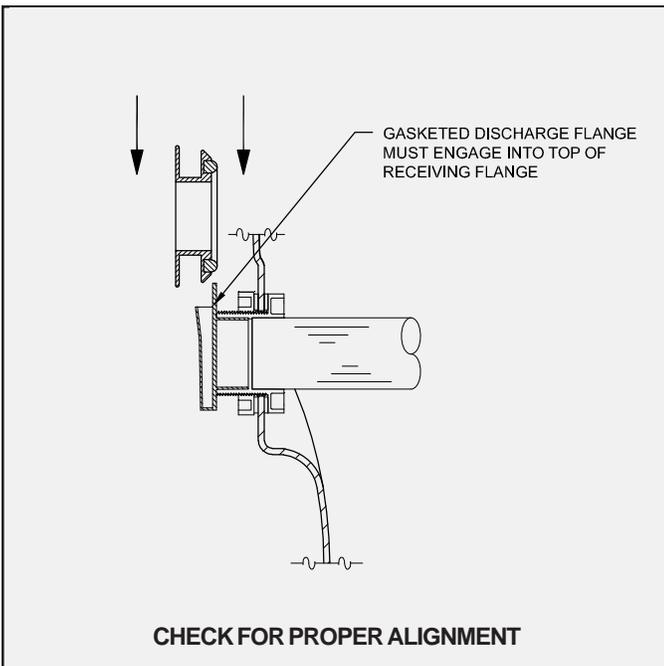
## WASTEWATER TREATMENT SYSTEM

### INSTALLATION OF THE BIO-KINETIC® SYSTEM (Cont.)



in a vertical position. If allowed to tilt, the system could rub the edge of the opening and be damaged. **NOTE:** Use the viewing port to be sure proper alignment and engagement of the outlet connection takes place. The discharge flange must engage the top of the receiving flange.

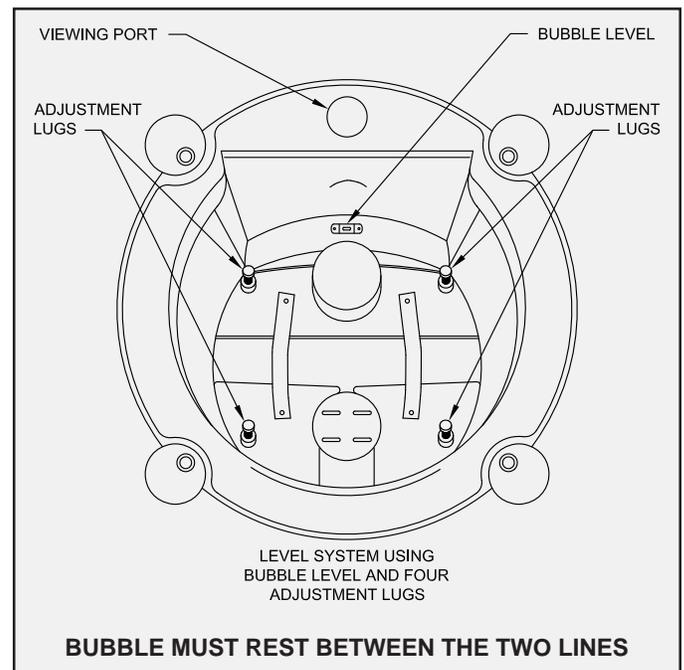
Continue to lower the system until the discharge flange fully engages the receiving flange and the top collar of the Bio-Kinetic system rests on the ledge of the clarification chamber access opening. To confirm that the discharge flange and receiving flange are fully engaged, look through



the viewing port in the top collar. Use the locking lug tool to twist each of the round, black locking lugs clockwise, so that each locking lug is positioned directly into the molded locking slots of the mounting riser.

#### PLACING THE BIO-KINETIC SYSTEM ON LINE

Locate the level indicator mounted above the outlet of the Bio-Kinetic system flow distribution deck. The bubble should be resting squarely between the two lines in the clear plastic case. If the location of the bubble indicates the system is not installed in a level position, the flow distribution deck should be leveled using the four adjustment lugs provided for this purpose. With the ratchet drive, extension and  $\frac{7}{16}$ " socket from the Tool Kaddy, turn each of the adjustment lugs the minimum amount



necessary for the bubble to rest squarely between the two lines in the clear plastic case. Leveling of the flow distribution deck is essential for proper operation of the flow equalization ports, chemical feed tubes and effluent weir within the Bio-Kinetic system.

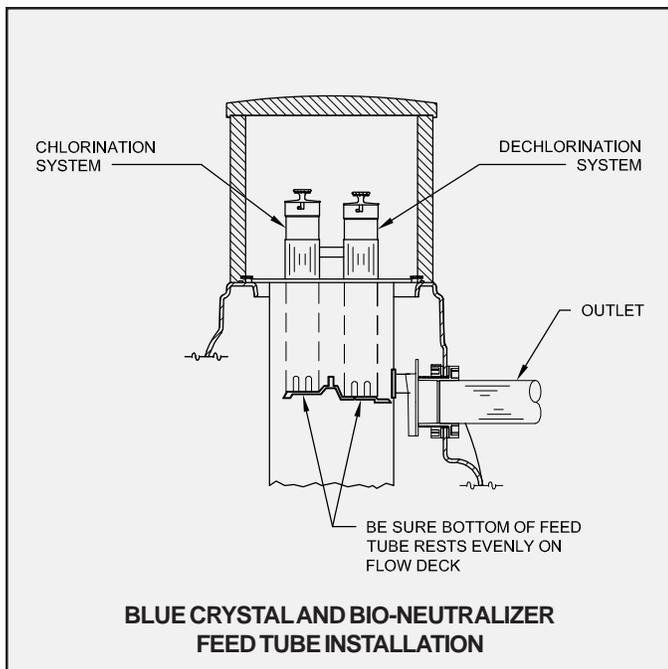
The system service cover can now be placed into position. Install the cover, handle side up, aligning the four holes in the cover with the four locking lug bolts. Be sure the optional chlorination and dechlorination feed tube access openings are in the proper position. The cover will come to rest on the collar of the Bio-Kinetic system. There is no need to add fasteners to the locking lug bolts.

If the installation requires a Blue Crystal disinfection system, the chlorine feed tube opening in the service cover must be positioned on the inlet side of the system

## INSTALLATION OF THE BIO-KINETIC® SYSTEM (Cont.)

nearest the aerator mounting riser. Before handling Blue Crystal disinfecting tablets, carefully read the container label and the "Warning" section of these instructions. To fill the chlorine feed tube, remove the cap, hold the tube (open end down) with one hand and insert Blue Crystal disinfecting tablets, one tablet at a time, until the tube is filled. Each tablet must lie flat in the stack. When the feed tube has been completely filled, replace the cap. Twist the cap clockwise until it locks securely into position on the chlorine feed tube. Install the feed tube, slotted end down, through the plastic collar molded into the top of the Bio-Kinetic system service cover. The feed tube will begin to engage the round recess in the flow distribution deck. Rotate the chlorine feed tube clockwise until it locks into position.

**NOTE:** The chlorine feed tube must always be installed through the mounting collar nearest the aerator mounting riser. If the installation requires disinfection and dechlorination, there will be two openings in the protective cover. The dechlorination feed tube must be installed nearest the system outlet.



### WARNING

*Blue Crystal disinfecting tablets are a strong oxidizing agent and highly corrosive. Tablets should be stored in a cool, dry, well-ventilated area away from combustible materials such as paper, petroleum products, chemicals, rags or cardboard. Contact with other liquids or chemicals may cause fire. Improper use of this product may cause personal injury or property damage. Always wear rubber gloves and either safety goggles or a face shield when handling Blue Crystal disinfecting tablets or working with the chlorine feed tube. Keep tablets out of the reach of children, as they can cause skin and eye damage, irritate the nose and throat,*

*and may be fatal if swallowed. If on skin, wash with plenty of soap and water for fifteen minutes, call a doctor if irritation persists. If swallowed, immediately drink large quantities of water, do not induce vomiting, avoid alcohol and get medical attention immediately. If inhaled, immediately remove victim to fresh air. In the case of fire, apply liberal quantities of water. It is a violation of Federal law to use Blue Crystal tablets in a manner inconsistent with the instructions printed on the storage container label.*

If the installation requires a Bio-Neutralizer dechlorination system, the Bio-Kinetic system will be supplied with a dechlorination feed tube. Before handling Bio-Neutralizer dechlorination tablets, carefully read the container label and the "Warning" section of these instructions. To fill the dechlorination feed tube, remove the cap, hold the tube (open end down) with one hand and insert the Bio-Neutralizer dechlorination tablets, one tablet at a time, until the tube is filled. Each tablet must lie flat in the stack. When the tube has been completely filled, replace the cap. Twist the cap clockwise until it locks securely into position on the dechlorination feed tube. Insert the dechlorination feed tube, slotted end down, into the mounting collar closest to the system outlet. The bottom of the tube must come to rest evenly on the floor of the flow deck.

### WARNING

*Bio-Neutralizer dechlorination tablets must be stored in a cool, dry place away from acids and oxidizers. Do not allow Bio-Neutralizer tablets to come into contact with chlorine tablets. Although not rated a hazardous material by the USEPA, exercise caution when handling and wash skin thoroughly with soap and water if contact occurs.*

Inspect the Bio-Kinetic system to verify that all four locking lugs are fully engaged into the molded locking slots in the riser, the moisture vapor shield is properly installed over the four locking lug bolts and the feed tubes are properly installed. Reinstall the Bio-Kinetic system access cover on the clarifier riser. Secure the access cover to the riser using the fasteners provided. Now proceed with the steps outlined in the Singulair Green System Final Check and System Start-Up instructions.

### SERVICING THE BIO-KINETIC SYSTEM

Each Singulair Green installation equipped with the Bio-Kinetic system should be inspected and serviced during each six-month prescheduled service inspection. Refer to the Bio-Kinetic System Service instructions for service procedures and recordkeeping policies.

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# SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

## FINAL CHECK & SYSTEM START-UP

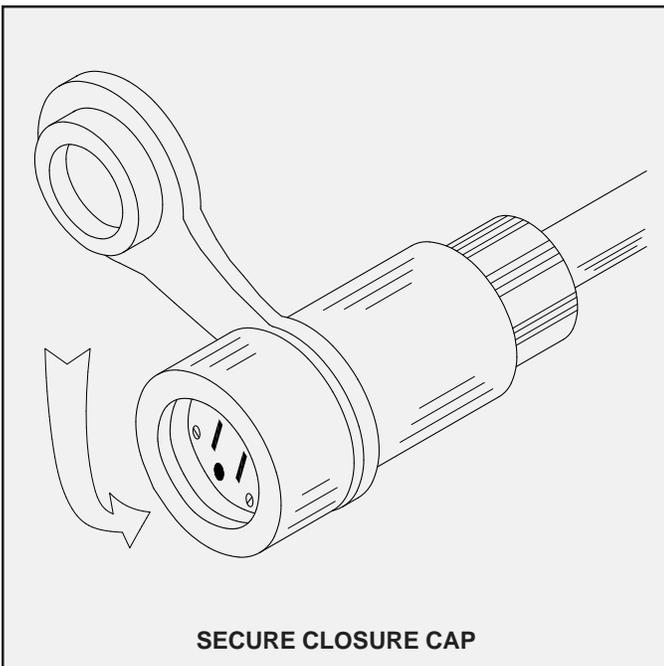
Immediately following installation of the Singulair aerator and Bio-Kinetic tertiary treatment device, the entire Singulair Green system should be given a final check and start-up. All tests should be performed to insure equipment is installed and operating properly. After all tests are satisfactorily completed, the selector switch in the Service Pro control center should be set to the "on" position. The aerator should not be turned off, even during extended vacation periods. If the system will not be operated for an extended period of time, the aerator should be removed from the system and properly stored.

**CAUTION: Any time an aerator or electrical test equipment is connected or disconnected, first shut off the selector switch located in the Service Pro control center. Failure to do so could result in personal injury or equipment damage. Always insure safe work procedures are followed.**

### PRELIMINARY ELECTRICAL INSPECTION

Inspect the control center for damage that might have occurred after its installation. Inspect all visible wiring to and from the control center. Report any damage to the owner at once; it must be corrected before proceeding with electrical testing.

Make sure the circuit breaker which supplies power to the Singulair Green system in the main electrical service panel is in the "off" position. Open the control center cover and place the selector switch in the "off" position. Proceed to the Singulair Green system and unplug the watertight electrical connector from the aerator power cord. Secure the closure cap in position on the electrical connector and return to the control center.



### VOLTAGE TEST OF CONTROL CENTER

Use the multi-meter provided in the Singulair Tool Kaddy to check the voltage in the Service Pro control center. Energize the circuit breaker in the main electrical service panel. Always follow safe work procedures when power to the Singulair Green system is energized.

Place one probe of the meter from the Tool Kaddy in the wire nut connector attached to the black wire and one probe in the wire nut connector attached to the white wire. It should read between 109 and 121 volts. Place one probe of the meter in the wire nut connector attached to the red wire and one probe in the wire nut connector attached to the white wire. The meter should read zero volts.

Once these readings are confirmed, place the selector switch in the "off" position, carefully reinstall the insert and proceed to the aerator.

### VOLTAGE TEST OF AERATOR

Remove the polarity tester from the Tool Kaddy and insert it into the receptacle of the electrical connector. When the circuit is energized, the polarity tester should indicate proper wiring of the connector and control center. If the polarity tester does not illuminate, press the reset button in the Service Pro control center. This will enable power to the polarity tester for ten seconds. After ten seconds, the Service Pro control center will detect an under current condition and turn off power to the electrical connector. Remove the polarity tester and insert one probe of the multi-meter into each slot of the electrical connector. It should read between 109 and 121 volts. **CAUTION: Do not energize the Singulair Green system if an electrical problem is found.** Advise the owner and return only when the problem condition has been corrected by a qualified electrician.

# SINGULAIR GREEN® SYSTEM FINAL CHECK & SYSTEM START-UP (Cont.)

## AMPERAGE TEST

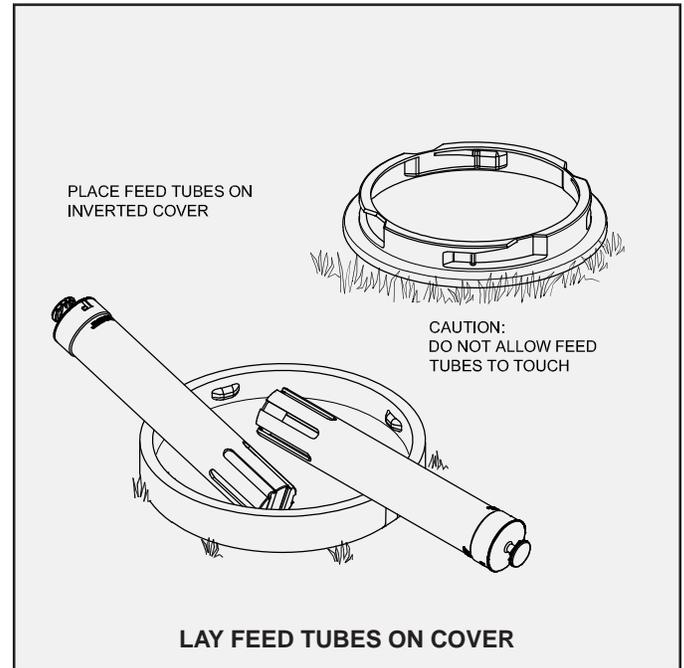
Remove the electrical test pigtail from the Tool Kaddy and place the current sensor of the multi-meter around the exposed black lead of the test pigtail. Plug the test pigtail in line between the two halves of the watertight electrical connector. When energized, read the current draw of the aerator. The initial reading should never be greater than 4.4 amps. After 48 hours of operation, break-in of the mechanical seals will allow the amp draw to drop to 4.2 amps or less. If an excessive current reading is obtained, de-energize the aerator immediately and do not re-energize it until the cause is found and corrected. When the test is complete, place the control center selector switch in the "off" position, unplug the test pigtail at both ends and plug the aerator directly into the receptacle on the underground electrical service cable. Make sure the two halves of the connector are firmly engaged to insure the integrity of the multiple lip seal for a moisture proof connection. Place the control center selector switch in the "on" position.

## AERATOR INSPECTION

Check the aerator to make sure it is running smoothly without vibration. Make sure the four brackets are properly seated in the four recessed grooves. Arrange the power cord assembly and electrical connector so they are secured in the mounting clips and are not touching the top of the aerator. Confirm that the debris screens are in place in the air intake ports. Replace the vented cover over the aerator mounting riser and check for excessive noise. Listen for evidence of debris in the aeration chamber striking the aspirator shaft. Occasionally, discarded construction materials may enter the sewer line and Singulair Green tank. They must be removed at once so that the aspirator shaft straightness tolerance is not compromised. Inspect the perimeter vent area to assure the unrestricted passage of air.

## FINAL INSPECTION OF BIO-KINETIC SYSTEM

Remove the access cover from the clarification chamber mounting riser. Carefully lift out the optional Blue Crystal and Bio-Neutralizer feed tubes and inspect them to make sure they are filled. Carefully lay the feed tubes on the access cover. Remove the Bio-Kinetic system service cover. Inspect the black locking lugs to make sure they are fully engaged into the recesses in the mounting riser. Inspect the level indicator to be sure that the Bio-Kinetic system is installed in a level position to insure proper operation. Replace the system service cover and optional Blue Crystal and Bio-Neutralizer feed tubes, making certain they are correctly positioned. The Blue Crystal feed tube must be positioned in the mounting collar on the inlet side of the system nearest the aerator mounting riser. The Bio-Neutralizer feed tube must be installed in the mounting collar closest to the system outlet. Replace the clarification chamber access cover.



## INSPECTION OF EFFLUENT DISPOSAL SYSTEM

Inspect the final discharge point to make sure that the outlet is unrestricted. If you suspect any possibility of a drainage problem, report it to the owner and request that corrective action be taken immediately. The system could be subjected to high water and liquid may back up into the inlet sewer line if not corrected. Locate the ground water relief point and insure it is clean and unobstructed.

When an effluent lift pump or other accessory equipment has been installed as part of the Singulair Green system, these items must be started-up, and placed into operation at this time. Refer to the individual start-up instructions furnished with accessory equipment and test them accordingly.

## WHEN YOUR INSPECTIONS ARE COMPLETE

Place the selector switch in the Service Pro control center in the "on" position. Latch the control center cover and secure it with a tamper evident seal. Notify the owner that the Singulair Green system is operating properly. Ask if there are any questions regarding system operation. Most start-up problems are caused by improper or incomplete installation of the system or because of a misunderstanding on the part of the contractor or owner. Refer to the Singulair Green Troubleshooting guide for direction if a problem is discovered during start-up.

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# SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

## FINAL INSTRUCTIONS TO THE OWNER

When the initial start-up of the Singulair Green system has been completed, take a few minutes to review the system and its operation with the owner. Although no owner maintenance is required, several precautions should be taken to insure maximum performance of the system. Emphasize the continued benefits and protection available through the three year limited warranty, prescheduled service inspections and lifetime aerator exchange program which have been included in the purchase of the Singulair Green system. These instructions, used with a review of the Owner's Manual, will give the owner a basic understanding of the Singulair Green wastewater treatment system.

### PRESCHEDULED SERVICE INSPECTIONS

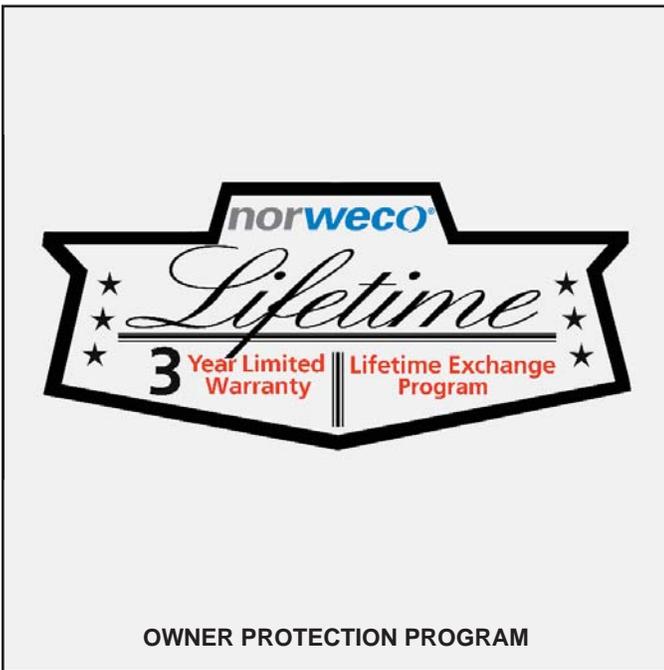
During the first two years of the limited warranty period, service inspections will be made on a semi-annual basis to insure proper system operation. Written reports on the condition of the equipment and quality of the effluent will automatically be made to the owner and to the local health department. Costs for travel and labor during this period are included in the purchase price of the Singulair Green system. If emergency service covered by the warranty is needed during the initial two year period, it will also be provided at no additional owner expense.

### CONTINUOUS OWNER PROTECTION PROGRAM

At the conclusion of the initial two year period, continued service inspections may be made semi-annually under a Singulair Green Service Contract available from the licensed dealer for a reasonable charge. Written reports will continue to be made automatically. Costs for travel and labor during service inspections are at no additional charge and emergency service is guaranteed within forty-eight hours. The owner will automatically be mailed a service contract with a letter outlining the advantages of continuing service and a fee quotation before the initial two year period is about to expire.

### NO OWNER MAINTENANCE

No owner maintenance is required on the Singulair aerator, electrical controls or Bio-Kinetic tertiary treatment device. System operation and individual components will be thoroughly checked by the service technician during each routine service inspection. The aerator motor is factory lubricated for the life of the unit. The Bio-Kinetic system contains a six-month supply of Norweco Blue Crystal disinfecting tablets and Bio-Neutralizer dechlorination tablets, if local environmental regulations require these items. The Service Pro control center has no user-serviceable parts inside and is secured with a tamper evident seal. Disassembly of any component part will void the limited warranty. Instruct the owner to contact the local dealer with questions and service requests.



### THREE YEAR LIMITED WARRANTY

The Singulair aerator, control center, Bio-Kinetic system and Singulair Green tank are warranted to be free from defects in material and workmanship under normal use and service for a period of three years from the date of system installation, provided the customer completes and returns the Warranty Registration Card to the factory. Registration is important: if the card is not received, the warranty will be recognized in effect for three years from the date the aerator, control center and Bio-Kinetic system were shipped from the factory. To qualify for service under warranty, the owner must not disassemble any component part. The defective component must be returned to the factory by the local dealer. It may not be returned directly to Norweco by the owner. The warranty is limited to the replacement of defective parts and does not cover damage resulting from accident, abuse, improper installation, unauthorized disassembly, faulty wiring or failure to follow operating instructions.

## FINAL OWNER INSTRUCTIONS (Cont.)

The owner should be advised to make the following periodic checks of the system to insure that it continues to operate at maximum performance levels:

1. The Service Pro control center should be checked daily. If the red warning light is glowing and the audible alarm sounding, depress the reset button on the control center cover. The light should go off and the audible alarm should be silenced. If the alarms activate again, call the local dealer for service.
2. Check the fresh air openings in each vented cover monthly to make sure the passage of air into the Singulair Green tank has not been restricted.
3. Inspect the effluent discharge point and ground water relief point monthly to make sure there are no restrictions to the effluent flow.
4. Make sure the pretreatment chamber is inspected at least every three years. Have it pumped only when necessary. See Singulair Green Tank Pumping instructions to determine when pretreatment chamber pumping is required.

### FOR BEST RESULTS

Be sure the owner understands the system's capabilities and purpose. Discuss the importance of the following items with the owner to maximize system performance.

#### Always

1. *Repair any leaking faucets or toilets promptly.*
2. *Discharge only biodegradable wastes into the system.*
3. *Divert down spouts and other surface water away from the system.*
4. *Keep mounting riser and covers accessible for service and inspection.*
5. *Consult your Norweco dealer before using enzymes, tank activators or similar additives.*
6. *Call your Norweco dealer if you have problems or questions.*

#### Never

1. *Connect roofing down spouts, footer drains, sump pump piping or garage and basement floor drains into the sewer line of the Singulair Green system.*
2. *Allow backwash liquid from a water softener to enter the system.*
3. *Dispose of items such as lint, cooking grease, scouring pads, diapers, sanitary napkins, cotton balls, cotton swabs, cleaning rags, dental floss, strings, cigarette filters, rubber or plastic products, paints and thinning agents, drain cleaners, gasoline, motor oil or other harsh chemicals in the domestic wastewater plumbing.*
4. *Dispose of disinfectants, pesticides, poisons or toxic materials down your drain.*
5. *Use the power supply to the aerator as a service receptacle for lawn and garden tools.*
6. *Interrupt power to the Service Pro control center, even during extended periods of non-use. If you anticipate a long term vacancy, contact the local dealer for proper procedures.*

### BEFORE LEAVING THE SITE

Remind the owner that the limited Warranty Registration Card must be filled in and mailed as soon as possible. Explain that your company's telephone number is found on the Service Pro control center. Offer to remove and return the Warranty Registration Card for the owner. Have them sign the card and return it to your office to be mailed to Norweco. As you leave, remind the owner to call your office if any questions arise.

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## **BIO-KINETIC® WASTEWATER TREATMENT SYSTEM**

# **SERVICE PROGRAM AND RECORDKEEPING**

Complete and detailed installation and service records must be kept on each Singulair system. Properly maintained records will enable you to determine, at a glance, the history and condition of each system sold. Keep all installation and service records filed as outlined herein so that you will have immediate access to this information. Following these procedures allows efficient organization of service inspection dates and service policy mailings. Their use will enable you to provide complete and professional service to your Singulair customers.

### **INITIAL ORDER RECORDS**

When a Singulair order is received, record the following information on your delivery slip: customer's name, address and telephone number, equipment ordered (including system model number and optional equipment such as Blue Crystal disinfection system, Bio-Neutralizer dechlorination system or risers) directions to the site, delivery date and time requested. Give this information to the dispatcher for delivery truck scheduling.

### **ASSIGN COMPONENTS FROM STOCK**

To begin processing the order, select the proper quantity of Norweco aerators from your stock. Open each aerator shipping carton at the top and remove the Singulair control center. Attached to the aerator is a copy of the three-part warranty registration card, an Owner's Manual and a red warning tag. Make sure that the model number and serial number on the outside of each aerator shipping carton matches the aerator nameplate and all three sections of the registration card. Give all control centers with attached literature to the tank delivery driver.

Remove the vent cap assembly from each aerator shipping carton and place it into your revolving stock. Do not remove the aerator or aspirator shaft from the shipping carton. Close each aerator carton and identify it on the outside with the name and address of your customer so that matching aerator and control centers will be installed. All aerators will remain in your plant until the customer requests installation and start-up.

Select the proper quantity of Bio-Kinetic systems and optional equipment from your stock. Make sure the model number for each Bio-Kinetic system matches the customer order. Identify the outside of each Bio-Kinetic system shipping carton with the customer's name and address.

### **TANK INSTALLATION RECORDS**

When the Singulair tank and controls are installed, the contractor or owner should sign an itemized delivery slip.

Your driver should tear off the bottom portion of the three part card attached to each aerator. One service and warranty record card should be filled out with the tank setting date, owner's name, address and telephone number, contractor's name, directions to the jobsite, a description of the installation, optional equipment installed and location of the tank and control center. Other service and warranty record cards for the same system should be attached to the completed card. All service and warranty record cards should be returned to your office and kept until the system is ready for start-up. Leave the remaining two portions of the three part card intact and store them with the Singulair Owner's Manual.

### **RECORDS OF SYSTEM START-UP**

When aerator and Bio-Kinetic system installation is scheduled, give all service and warranty record cards to your installer. These cards contain all information needed to perform start-up services. The date of aerator installation and start-up should be filled in and these cards returned to the office when each aerator and Bio-Kinetic system has been installed.

### **SINGULAIR CUSTOMER MASTER FILE**

When system start-up is complete, transfer the owner's name, address, telephone number, system model number, serial number for each aerator and system installation date from the service and warranty record card to a standard 4 x 6 file card. Place all cards alphabetically by owner name in the Singulair master file. The file should contain one card for each Singulair installation. It must be updated whenever an exchange aerator is installed or system ownership changes.

### **SINGULAIR SERVICE FILE**

File each original service and warranty record card in the Singulair service file. The service file should be set up on the first month you begin to install and start-up Singulair systems. Make a divider tab which has visible the number "1" on it. File the service and warranty record card for each

## SERVICE PROGRAM AND RECORDKEEPING (Cont.)

system placed into operation this month ahead of this divider "1" tab. On the first day of the second month, make a new divider tab titled "2." File this divider behind the first one and move all registration cards filed last month to a new position in front of divider #2. Place all record cards for installations started-up in this, your second month, ahead of divider #1. On the first day of each succeeding month, a new divider must be placed at the end of the file, then all cards moved back one divider, then all new installation cards for the current month filed ahead of divider #1. Do not file current installation cards prior to advancing the previous month's cards.

### SCHEDULING SINGULAIR SERVICE INSPECTIONS

Four semi-annual service inspections are to be completed after the system has been installed. They are scheduled after six, twelve, eighteen and twenty-four months. To determine which systems are due inspections each month, update the Singulair service file with a new month divider on the first day of the month and remove all cards from behind divider tabs 6, 12, 18, and 24. Fill out one three-part service inspection record card for each system with system model number, all aerator model and serial numbers, county, owner's name, address and directions to the site. Be sure this information is duplicated on all three sections of the card. The other side of the card will be filled out by the service technician at the site. If this is to be the 24th month inspection and the owner has not returned a service contract, check the box on all three portions of the card indicating that the service policy has expired. Give the service inspection record cards to the service manager.

Your service technicians must fill in the remaining items on both sides of each card as they make the inspections. The top portion is torn off and left with the owner. The lower two portions are returned to the office. The middle portion of the card is for health department notification. Most health departments prefer that these cards are collected by the distributor and mailed in monthly rather than individually.

The bottom portion of the service card is retained for your records. It should be filed behind the service and warranty record card for that installation. This allows all records of service inspections for each installation to be filed together. As you file the service inspection cards, you should update the service and warranty record card with the date and results of your service inspection.

### EMERGENCY SERVICE CALLS

Occasionally you may be asked to service a Singulair system in advance of its next prescheduled inspection. When the service request is taken, look up the service and warranty record card in the service file. Use it to prepare a new three-part service inspection card and check the box for "Special Service Call." This service inspection card must

be completed by your service technician and returned to your office. When it is returned, the check for "Special Service Call" signifies that the service and warranty record card for this installation probably will not be found following a divider tab scheduled for service this month. When the record card is located, fill in the service call date for the next prescheduled inspection and file the service card in chronological order behind the service and warranty record card. When the next prescheduled inspection for this system is due, service will be considered complete.

### MAILING SERVICE POLICIES

Initial Singulair service is in effect for the first twenty-four months of system operation. After that time the owner is invited to continue service on an annual basis. Service contracts should be mailed in the twenty-second month of system operation. After updating the service file at the beginning of each month, remove all service and warranty record cards from behind divider tab #22 and mail a service contract and cover letter to each. Follow-up each



mailing to owners who have not responded to your 22nd month notice by re-mailing to all service and warranty record cards behind divider tab #23 whose contracts have not been renewed. Record the dates of these mailings on the registration card.

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# SINGULAIR® BIO-KINETIC®

## WASTEWATER TREATMENT SYSTEM

# SERVICE PROGRAM AND RECORDKEEPING (Cont.)

### RENEWED SERVICE POLICIES

If an executed service contract and fee are received by the end of the two year service period, the service and warranty record card (followed by four completed service inspection cards) is retained in the service file. Service policy inspections after the initial two year program are performed in the same fashion as initial inspections. Cards each month from behind divider tabs 6, 12, 18 and 24 and from behind tabs which are multiples of six: 30, 36, 42, 48, etc. are used to schedule routine service for the month. Fill out three-part service cards for each installation and continue to file completed service inspection cards chronologically behind individual service and warranty record cards. Remember to update the service and warranty record cards for each installation as service contract inspections are performed.

Continued service policies are renewed annually. Renewal service contracts should automatically be mailed in their tenth month. They should be done monthly when initial service contracts are mailed to owners in the twenty-second month of Singulair system operation. In any given month, service contracts due to expire in two months will be located behind divider tabs #34, 46, 58 and so forth. Second mailings may be made from cards located behind divider tabs #35, 47, 59, etc. excluding those whose renewal contracts have been returned.

Executed service contracts should be filed alphabetically by owner's name in a separate file. Multiple copies for owners who consistently renew their contracts should be attached to each other and organized chronologically.

### LAPSED SERVICE CONTRACT RENEWALS

From time to time an owner may wish to renew a service contract which had been permitted to lapse. When the executed contract and fee are received, remove the service and warranty record card, with all service cards, from the alphabetical master file. Only the 4 x 6 master card should remain. Refile all other cards in the active service file behind the divider tab it would have been found in, according to system age as if the service policy had been continuously in force. This filing order will allow you to use the procedures already established for service scheduling and renewal policy mailings.

### INSTALLATION OF EXCHANGE AERATORS

When an owner uses the lifetime exchange program to receive a new aerator, the three year limited warranty begins again. However, the two year initial service program does not. No service is performed unless a service contract is in effect. When the exchange aerator is installed, a new warranty registration is included. The top portion, containing the new aerator serial number is to be kept with the Owner's Manual. The middle portion must be signed by the owner and returned to the factory. The lower portion is filed behind the original card in the Singulair customer master file or service file, whichever is appropriate. Note on the new card the aerator installation date and also mark the card that the six, twelve, eighteen and twenty-four month inspections will not apply. Record the exchange unit serial number and installation date on the 4 x 6 card in the alphabetical master file. It is important that service and warranty record cards be retained for installations with exchange aerators because future determinations of aerator age will be based upon the original system start-up date.

### INACTIVE SINGULAIR INSTALLATIONS

If an executed service contract and fee are not returned by the end of the twenty-fourth month of system operation, the installation is considered inactive. Its service and warranty record cards and all service cards must be removed from the active service file. They are refiled behind the alphabetical listing card in the Singulair customer master file. Inactive cards remain in this file unless the owner executes a new service contract at a later date. All renewed service contract holders whose contracts lapse must also have their cards transferred to the alphabetical file. If an owner requests service on an out-of-warranty system, service should be performed on a time and materials basis. A three-part service card must be completed as usual and the distributor's copy should be returned to the office and filed in order behind the last service card for the installation.

DEAR OWNER:

**SINGULAIR® BIO-KINETIC®**  
WASTEWATER TREATMENT SYSTEM

Dear Owner:

When you purchased your Norweco Singulair Bio-kinetic wastewater treatment system, a two year limited warranty and fifty year exchange program were included in the purchase price. The purchase also provided for a two year service inspection program at no additional cost to you.

We are pleased to be able to offer a continuing service program similar to the one originally included with your system, now that your initial service program and limited warranty have expired. Our continuing policy ranges of the way from routine inspections and emergency service to owner limitation on labor costs. We have enclosed a complete copy of our renewable service contract, with costs for your system, for your review and consideration.

We would be happy to answer any questions regarding the renewable service program or any other questions you may have regarding operation and maintenance of your Singulair wastewater treatment system. Please take the time to review and consider the advantages of the service contract we have enclosed. As in the past, our company also continues to offer service and repair for systems on an "as needed" basis in the area we serve. Thank you.

Sincerely yours,  
Your Local Licensed Norweco Distributor.

NORWECO, INC. - NORMAN, OHIO - USA

**norweco**  
**SINGULAIR®**  
SERVICE CONTRACT

OWNER'S NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE NO.: \_\_\_\_\_

DIRECTIONS: \_\_\_\_\_

EFFECTIVE DATE: \_\_\_\_\_ 19\_\_

EXPIRATION DATE: \_\_\_\_\_ 19\_\_

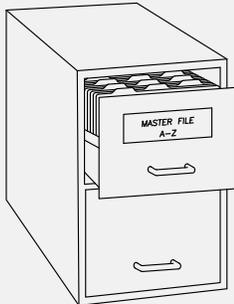
SYSTEM INSTALLED ON: \_\_\_\_\_

This one year service contract for the Singulair Bio-kinetic wastewater treatment system located at the site described above, is intended to enable the owner to economically obtain regular service inspections for the Singulair unit, as well as to non-scheduled or special service which may be required by a qualified technician. When this contract is in force, the owner will not be charged for any routine service labor under the terms of this service agreement. A technician will regularly inspect this unit at four month intervals. It will also be inspected (known as a special owner service request) within a four month period. The contract will remain in effect for a period of one year, as specified in the effective and expiration dates listed above.

**PLEASE CONSIDER**

# THREE SIMPLE FILES PROVIDE AUTOMATIC SERVICE SCHEDULING

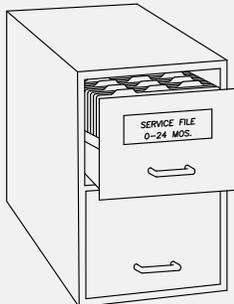
Detailed and accurate record keeping guarantees efficient service performance, reduced man-hours and increased profits.



**MASTER FILE**

Contains a 4 x 6 file card for each installation which:

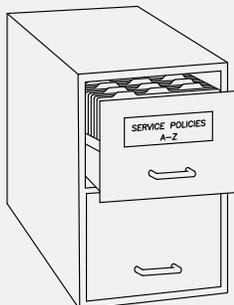
- Lists owner's name, address and telephone number
- Lists system installation date, model number and serial number
- Is updated when ownership changes
- Is updated when an exchange aerator is installed
- Is followed by service and warranty record card and all service inspection cards for inactive installations



**SERVICE FILE**

Contains monthly divider tabs used to:

- File service and warranty record cards by month of installation for in-warranty components
- File all service and warranty record cards for out-of-warranty systems with continued service policies



**SERVICE POLICY FILE**

Contains all executed service contracts for each Singulair installation filed:

- In alphabetical order by owner's name
- In chronological order by contract effective date

**PROGRESS THROUGH**

***norweco***<sup>®</sup>  
www.norweco.com

**SERVICE SINCE 1906**

# ***norweco***® **SINGULAIR**®

## **BIO-KINETIC® WASTEWATER TREATMENT SYSTEM**

### **SINGULAIR® SYSTEM AND CONTROL CENTER SERVICE**

To maximize owner protection, the Singulair Bio-Kinetic wastewater treatment system is backed by a three year limited warranty on system components and a lifetime aerator exchange program. The initial selling price includes a series of four prescheduled service inspections at six month intervals which cover the first two years of system operation. These inspections should completely familiarize the owner with the Singulair Bio-Kinetic wastewater treatment system and answer any questions that arise. Carefully check all component parts of the Singulair system to insure proper operation and overall wastewater treatment quality. Regular service inspections by qualified technicians establish an excellent relationship with the owner as well as with local health officials. They must be performed faithfully to keep you up-to-date on the performance of each Singulair system you have installed.

While making service inspections during the initial two year period, be sure to explain to the owner that they are being performed at no charge and that the same coverage can be renewed on a continuing basis at a nominal charge following the initial two year program. Point out the advantages of continuous protection with the service contract. Be sure to remember that service contract sales have advantages for the distributor as well. They result in more efficient service inspection scheduling with more actual "service time" and less "travel time" per day. These savings can be passed on to the owner through more attractive renewal contract fees in future years.

All of the equipment and tools needed for Singulair system service work are contained in the Singulair field service cart and Tool Kaddy. You will also need exchange Bio-Kinetic systems, a supply of Blue Crystal disinfecting tablets and a supply of Bio-Neutralizer dechlorination tablets. Bio-Kinetic systems may be supplied with or without Blue Crystal and Bio-Neutralizer chemical feed systems. Therefore, check your Distributor Service and Warranty Record Card carefully to be sure you have selected exchange Bio-Kinetic systems with correct flow distribution decks.

#### **SINGULAIR SYSTEM SERVICE PROVIDES CONTINUOUS OWNER PROTECTION WITH THESE ADVANTAGES**

- Travel and labor costs during service inspections are provided at no charge to the owner.
- Special service calls that may be necessary during the program are performed at no charge to the owner.
- Owner's investment, property and the environment are fully protected.
- Guaranteed response to emergency service requests is made within forty-eight hours.
- Local health department is automatically notified of system condition by the distributor.
- Owner has an up-to-date, written record of the condition of the Singulair aerator, control center and Bio-Kinetic system.
- Owner is continuously informed of the treatment quality provided by the system.
- Routine maintenance is performed by factory-trained service technicians; no owner maintenance is required.
- Owner can expect maximum aerator life and minimal power consumption costs due to regular, qualified service visits.

These instructions are designed to cover the important points of Singulair Bio-Kinetic system operation which should be checked during each service inspection. They have been arranged in normal service order to assure that you make the most efficient use of your time. While a visual check is normally sufficient to be certain that each item is in proper working order, several items listed in this manual are indications of potential problems. If anything unusual is encountered, refer to the Singulair Troubleshooting Guide.

# NORWECO PRESCHEDULED SERVICE INSPECTIONS (Cont.)

## Before you leave your plant

- Be sure you have a complete list of service needs in the area you are going to work.
- Check to see that you have detailed directions to each installation.
- Be sure your service vehicle is fully stocked.

## When you arrive at the site

- Meet the owner. Introduce yourself and present your business card.
- Explain the service inspection program and outline what you will do. Mention that your services are at no charge.
- Ask for permission to inspect the Singulair control center and tankage.
- Make sure the owner has a copy of the Owner's Manual, serial number tag and previous Service Inspection Record Cards.
- Suggest that the owner record the information from the Service Inspection Record Card in the Supplemental Service Record Section of the Owner's Manual.
- Ask if there are any questions concerning the system or its operation.

## CONTROL CENTER SERVICE

**CAUTION: If your visual inspection of the Singulair control center reveals a problem, be sure to shut off the appropriate circuit breaker in the main service panel - then test all circuits with the electrical multi-meter to be sure they are de-energized before proceeding.**

1. If there is no evidence of an electrical problem, check the main service panel to see that the circuit breaker for each Singulair system is turned on.
2. Make sure the panel is turned on and the power indicator light is on. If there are any alarm lights activated, refer to the Singulair quick start guide for further diagnostic instructions.
3. See that your company's identification label is affixed to the Singulair control center and is legible. Replace the label if necessary.
4. Make sure that the aerator model number and serial number tag is attached to the control center or has been stored by the owner in a secure location. If it has been misplaced, provide a new one and fill in the appropriate information.
5. See that the Owner's Manual has been stored by the owner in a secure location. If it has been misplaced, supply the owner with a new one.
6. Inspect the wiring from the control center to the aerator, as far as it is visible, and notify the owner if you see any damaged areas.
7. As you leave, make sure the Singulair control center is turned on and there are no active alarms. Secure the Singulair control center with a new tamper evident seal.
8. Make appropriate notations on the condition of the electrical control center on the Service Inspection Record Card.

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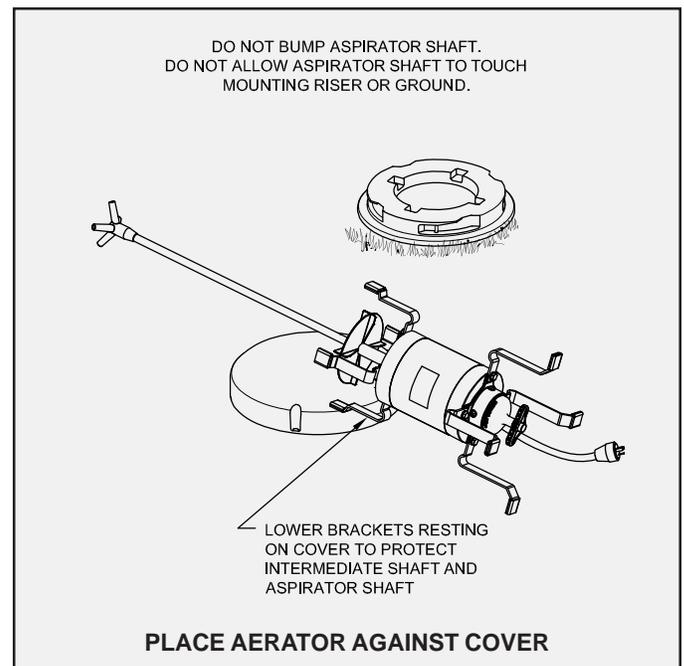
# SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

## SINGULAIR® AERATOR SERVICE

The Singulair aerator has been specifically designed for use in the Singulair Green system and is the only electro-mechanical component. It provides maximum air introduction, thorough mixing and assures reliable, economical wastewater treatment. The Singulair aerator is factory lubricated for the life of the unit. No service inside the aerator is required. Unauthorized disassembly will void the warranty. If a problem is suspected with the aerator, return it to Norweco for warranty replacement or exchange.

**CAUTION: Any time an aerator or test equipment is connected or disconnected, first shut "off" the selector switch in the control center. Failure to do so could result in personal injury or equipment damage.**

1. Open the control center and push the reset button on the Service Pro panel.
2. As you approach the Singulair Green tank, listen for excessive noise before removing the vented cover.
3. Remove the vented access cover located above the aeration chamber and place it aside. The aerator should be operating normally.
4. Make sure the debris screens are in place in the air intake ports. Manually check the aerator brackets for excessive vibration.
5. Check the aeration chamber for odor. A musty odor indicates the presence of aerobic conditions essential for good treatment. A septic odor indicates inadequate aeration, suggesting that the passage of air into the tank contents has been restricted.
6. Carefully remove the debris screens from the air intake ports. Wipe the aerator air intake ports with a damp cloth being careful not to allow dirt or debris to enter the intake openings.
7. Using the Singulair flowmeter, check the air delivery. It should read approximately 3 CFM. Refer to the Singulair Aerator Flowmeter instruction sheet for complete details.
8. Inspect the outside of the electrical connector assembly for worn spots. Uncouple the connector and check for any evidence of moisture inside. Secure the closure cap over the female half of the connector to keep it clean and dry while you work.
9. Within 2-3 minutes after turning off the aerator, perform a settleable solids test of the aeration chamber contents. Refer to Singulair Green Tank Pumping instructions for details.
10. Remove the aerator from the mounting riser. BE CAREFUL when removing the aerator to see that the aspirator shaft does not come in contact with the mounting riser. The aspirator shaft is straightened to a critical tolerance before it is shipped from the factory. It must retain this straightness tolerance or vibration may result. Excessive vibration can greatly shorten aerator life and could also cause the unit to consume more electrical power than necessary.
11. Check the rubber shock absorbers on each bracket for wear. Replace any that are missing or worn.
12. Check the power cord from the moisture resistant electrical connector to the aerator. Be sure it is free of nicks or worn spots.
13. Lay the aerator on its side against the aerator mounting riser or vented cover. Check to see if there is a water mark on the outside of the aerator and notify the owner if one is found. The aerator is flood proof and mechanically designed so that it can return to normal operation unharmed after being subjected to intermittent high water. However, a high water mark on the outside of the aerator does indicate there is a problem in the effluent disposal line, disposal field or elsewhere in the installation. If the problem is left uncorrected, wastewater could back up into the tank, void the aerator warranty and eventually flood the facility.



## SINGULAIR® AERATOR SERVICE (Cont.)

14. Carefully loosen the two stainless steel set screws on the bottom of the intermediate shaft and remove the aspirator shaft. Remove any internal deposits from the four aspirator orifices with the aspirator shaft cleaning tool. Connect the aspirator shaft to the shaft cleaning hose and outside water faucet to flush the inside of the aspirator shaft clean. Use full water pressure. Remove the shaft from the cleaning hose and inspect the bore to see that it is clean.
15. Push the stainless steel brush with extension handle through the stainless steel intermediate shaft and hollow motor shaft to dislodge any residue that may have accumulated. **NOTE:** Do not flush the motor shaft with water. Remove any debris from the air intake openings.
16. Thoroughly clean both the bottom and the top surfaces of the foam restrictor.
17. Reinstall the aspirator shaft into the intermediate shaft. Match the permanent alignment marks on the aspirator and intermediate shafts to maintain the original factory balance. Tighten the set screws with a tee-handle allen wrench, finger tight only. Too much pressure may dish the side of the aspirator shaft and compromise the straightness tolerance.
18. Clean or replace the four air intake debris screens. Make sure one screen is placed in each intake opening to prevent debris from entering the aerator.
19. Visually check the aeration chamber surface for the presence of grease or oil. An accumulation of these materials indicates the pretreatment chamber should be evaluated. Refer to Singulair Green Tank Pumping instructions for details.
20. Check the aeration chamber for the presence of non-biodegradable materials, paper, mop fibers, hair, grease or oil. A significant accumulation of these materials in the aeration chamber indicates the pretreatment chamber should be evaluated. Refer to Singulair Green Tank Pumping instructions for details.
21. Inspect the underground power cable in the aerator mounting riser for breaks or scars in the insulation. Examine the inside of the mounting riser for evidence of ground water entry.
22. Carefully reinstall the aerator in the mounting riser. Do not allow the aspirator shaft to touch the mounting riser side walls. Make sure the weight of the aerator is evenly distributed on the upper end of all four mounting brackets.
23. Using a multi-meter, check the voltage at the electrical connector. The meter should read 115 volts  $\pm$  5% when the selector switch in the Service Pro control center has been placed in the "on" position. Record the voltage on the Service Inspection Card.
24. Wipe the aerator electrical connector with a clean, dry cloth to remove moisture or dirt accumulated during service. Plug the electrical test pigtail in between the male and female electrical connectors and check the amperage of the newly serviced aerator. The aerator should not draw more than 4.2 amps. Record the amperage on the Service Inspection Card. **NOTE:** When the aerator is started for the first time, the break-in period may cause the amp draw to be as high as 4.4 amps for the first 48 hours of operation.
25. Inspect the perimeter vent area in the aerator access cover and clear the fresh air openings of any debris to insure unrestricted passage of air. Reinstall the access cover on the mounting riser.
26. Make the appropriate notations regarding the aerator, the results of the settleable solids test and related items on the Service Inspection Card.
27. Proceed with clarification chamber service as outlined in the Clarification Chamber and Bio-Kinetic Service instructions. When the routine service is complete, return to the Service Pro control center and confirm that the selector switch has been returned to the "on" position. Close the control center cover and secure it with a new tamper evident seal.

### IF AN AERATOR MUST BE REMOVED

The service technician should be able to restore most installations to full operation during the initial service call. If the aerator is no longer eligible for the three-year limited warranty, the aerator should be removed and replaced with a remanufactured and fully warranted exchange unit from your rotating stock. This will become the permanent aerator in service at the facility and your company's service records should be updated to reflect the new aerator serial number. If the serial number portion of the Warranty Registration Card is still attached to the control center, be sure to fill in the new serial number for the owner. When you have accumulated several aerators requiring factory service, return them to Norweco. This reduces administrative time and the cost of shipment per unit. When remanufactured aerators are returned to you, add them to your rotating stock. In this way, the installation is restored to full service with a fully warranted unit in only one service trip.

### EXCHANGE AERATOR COSTS

You may compute exact costs for exchange aerators during your service inspection since the cost is determined by system age, regardless of condition. Exchange rates are given on the Singulair Warranty and Exchange Program data sheet. In cases where the aerator has failed under warranty, you should replace it with a loaner unit to insure continued operation of the system and protect effluent quality. Return the warranted unit to the factory immediately for replacement and schedule reinstallation with the owner at the earliest possible convenience when it is returned to you.

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## SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM CLARIFICATION CHAMBER AND BIO-KINETIC® SERVICE

Check operation of the Service Pro control center and complete all Singulair Aerator Service instructions to the point of aerator reinstallation before proceeding with clarification chamber service. Do not reinstall the aerator in the mounting riser until the Bio-Kinetic system has been removed from the Singulair Green tank. The aerator must be reinstalled prior to cleaning the clarifier walls to insure the return of settled solids to the aeration chamber by hydraulic currents flowing through the sludge return.

**CAUTION:** Anytime an aerator or service pump is connected or disconnected, first shut off the selector switch in the control center. Failure to do so could result in personal injury or equipment damage.

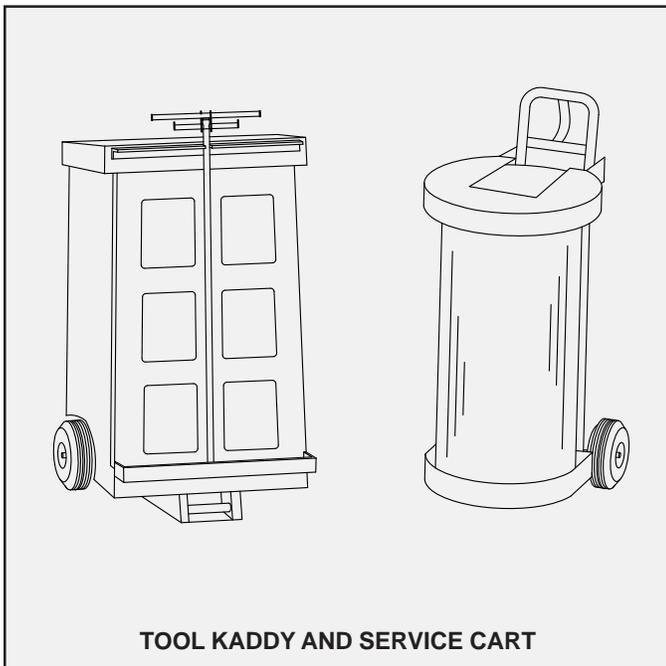
1. Move the Singulair field service cart with exchange Bio-Kinetic system and Tool Kaddy near the clarification chamber access cover. Remove the service container from the field service cart, unscrew the wing nuts holding the service container cover and set them aside. Remove the service container cover and place it upside down along side the clarification chamber access riser. Remove the exchange Bio-Kinetic system from the service container and set it aside. Remove the universal tool from the front of the Tool Kaddy and open the doors.

Bio-Kinetic system and the liquids in the tank for color and odor. Note the condition of the system on the Service Inspection Card.

**NOTE:** Attached to the Bio-Kinetic system service cover is a red tag listing the Singulair Green system model number, classification and daily treatment capacity. This service cover and tag must remain with the installation and be reinstalled after exchanging the Bio-Kinetic system.

**CAUTION:** Chemicals or liquids from the Bio-Kinetic system feed tubes should not be allowed to contact skin or clothing. Refer to the Blue Crystal and Bio-Neutralizer handling instructions and container labels for safety procedures and first aid. Liquids or chemicals from the feed tubes may cause grass or landscaping to discolor.

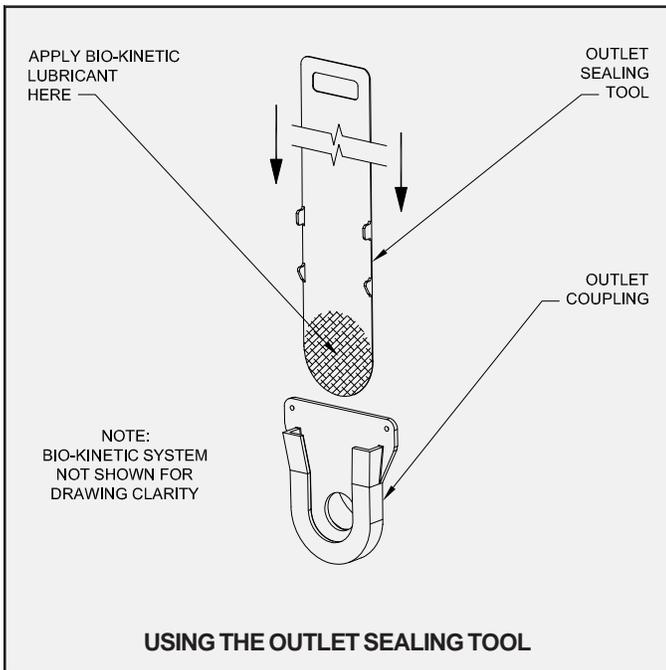
3. To prevent loss of liquid from the Singulair Green system during service, use the Bio-Kinetic system outlet sealing tool. Thoroughly lubricate both sides of the tool below the tabs to the rounded end with Bio-Kinetic lubricant. With the tabs facing toward the Bio-Kinetic system, insert the tool in between the Bio-Kinetic outlet flange and the receiving flange of the tank. Completely insert the tool to the bottom of the outlet coupling.
4. Using the disassembly tool, remove the internal components from the Bio-Kinetic system. The internal components should be set aside while the remainder of the Bio-Kinetic system is removed.
5. The Bio-Kinetic system is equipped with a drain valve and a fill valve to allow for easy removal and reinstallation during service. The locking lugs must be disengaged to allow for removal. Using the locking lug tool, rotate each of the four round black locking lugs clockwise from the locking slots in the access riser. Insert the universal tool lifting handle into the upper lip of the Bio-Kinetic system outer chamber bucket.



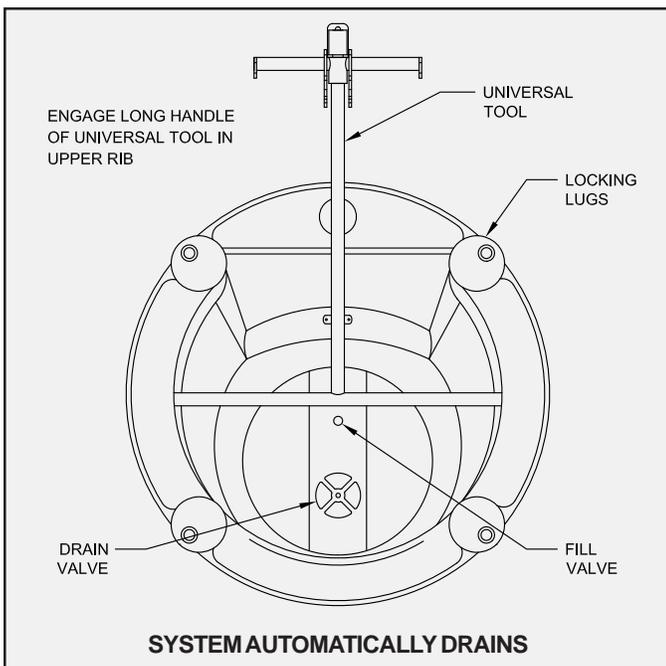
TOOL KADDY AND SERVICE CART

2. Remove the polypropylene clarification chamber access cover and turn it upside down near the access riser. If the unit is equipped with Blue Crystal or Bio-Neutralizer feed tubes, carefully remove each feed tube, one tube at a time. Lay each feed tube down on the access cover. Remove the Bio-Kinetic system service cover and check the condition of the

## CLARIFICATION AND BIO-KINETIC® SERVICE (Page 2 of 6)

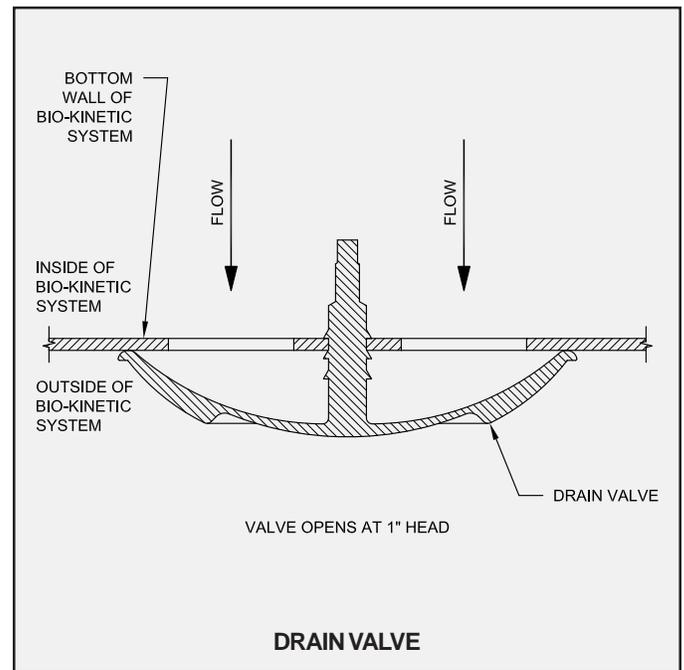


6. While standing over the riser, begin lifting the system from the tank. The self drain valve will automatically open as the system is lifted out of the riser. Continue lifting until the majority of the water has drained out of the system. Remove the Bio-Kinetic system from the mounting riser. Set the Bio-Kinetic system on the upside down lid of the service container
7. Record the color and condition of the Bio-Kinetic system on the Service Inspection Card and on the "Supplementary Service" section of the Owner's Manual. Make appropriate notations on the condition of the clarification chamber. Also note the liquid level on the filter media. The peak flow filter media should



be clean in appearance if the hydraulic loading has never been great enough to cause the liquid level in the clarification chamber to rise above the design flow filter media. If a temporary hydraulic surge has occurred, a dark line will be visible on the peak flow filter media. Note the system water level on the Service Inspection Card.

8. Unscrew the discharge flange assembly and remove both pieces. It may be necessary to hold the inside threaded flange to unscrew the two pieces. After both pieces of the discharge flange are removed, place the internal components back into the Bio-Kinetic system.



9. Place the Bio-Kinetic system into the service container. The outlet of the Bio-Kinetic system must align with the flat panel in the container. Thread the discharge flange assembly together and place it on the flow deck. Now put the service container cover in place.
10. Reinstall the Singulair aerator as outlined in the Aerator Installation instructions. The aerator must be in operation while the remaining clarification chamber service is performed.
11. Check the surface of the clarification chamber for grease or biologically untreatable material. A significant accumulation of these materials indicates

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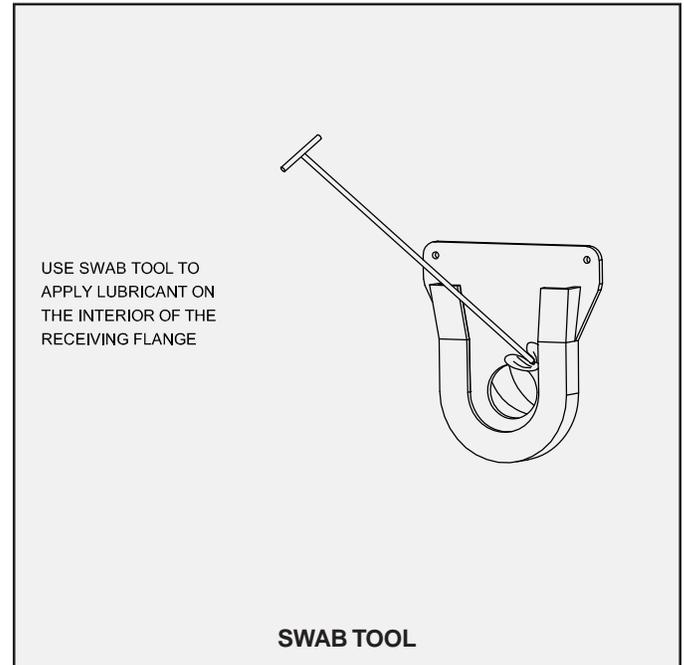
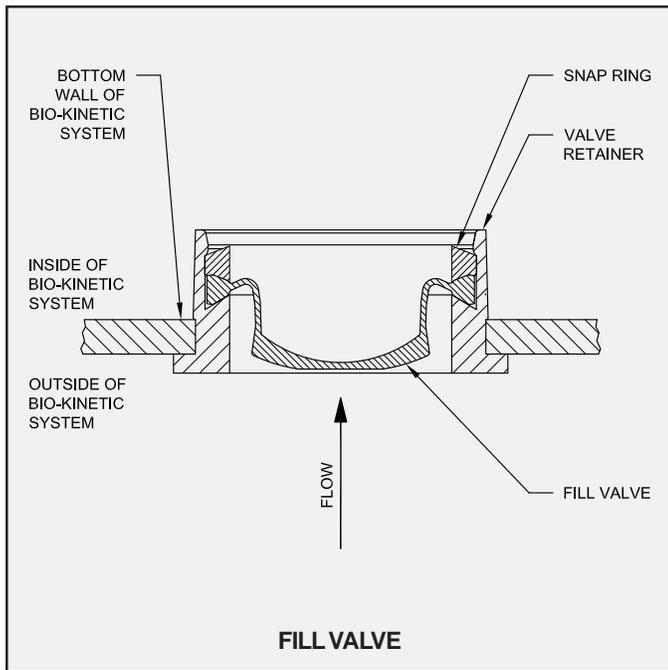
# SINGULAIR GREEN® BIO-KINETIC®

## WASTEWATER TREATMENT SYSTEM

### CLARIFICATION AND BIO-KINETIC® SERVICE (Page 3 of 6)

the pretreatment chamber should be evaluated to determine if pumping is required. With the aerator running, use the hopper scraping tool to gently scrape all areas of the clarification chamber hopper side walls. Scrape all the way down to the bottom of the chamber, below the discharge of the Bio-Static sludge return. Then scrape the small flat area at the bottom of the hopper, pushing toward the aeration chamber as far as possible.

is a problem with drainage. Improper drainage will lead to flooding of the Singulair Green Bio-Kinetic wastewater treatment system and must be reported to the owner. Examine the inside of the access riser for evidence of surface water entry.



12. If the Singulair Green tank is pumped during system service, the pressure sensitive fill valve will fill the Bio-Kinetic system automatically as the tank refills.

**NOTE:** It is important that the clarification chamber side walls be cleaned only after the aerator has been serviced and reinstalled. The aerator must be operating so that settled sludge will be fully returned to the aeration chamber by the hydraulic currents flowing through the Bio-Static sludge return.

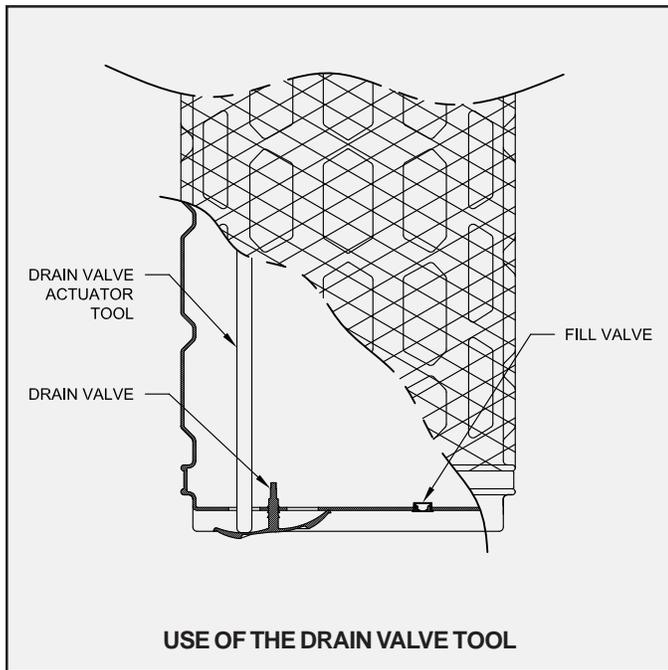
13. Visually check the Bio-Static sludge return to insure that it is securely engaged in the aeration/clarification chamber wall.
14. If necessary, use water to wash away any sludge from the inside of the system mounting riser, grade riser, cover and surrounding grass or landscaping.
15. Note the liquid level in the clarification chamber. If the liquid level is above the flow line of the outlet coupling, consult the troubleshooting guide to determine if there

16. Examine the condition of the Singulair Green tank receiving flange. Any debris that has accumulated in the grooves of the receiving flange must be removed. Wipe the face of the receiving flange and the internal surface of the grooves clean. Using the swab tool, apply a liberal amount of Bio-Kinetic lubricant to the entire face of the receiving flange and the inside of the grooves. Apply the lubricant evenly until all interior surfaces of the receiving flange and grooves are thoroughly coated.

**CAUTION:** Bio-Kinetic lubricant has been specially formulated. Use of other lubricants, especially petroleum based lubricants, can cause degradation of the rubber components and will void the warranty.

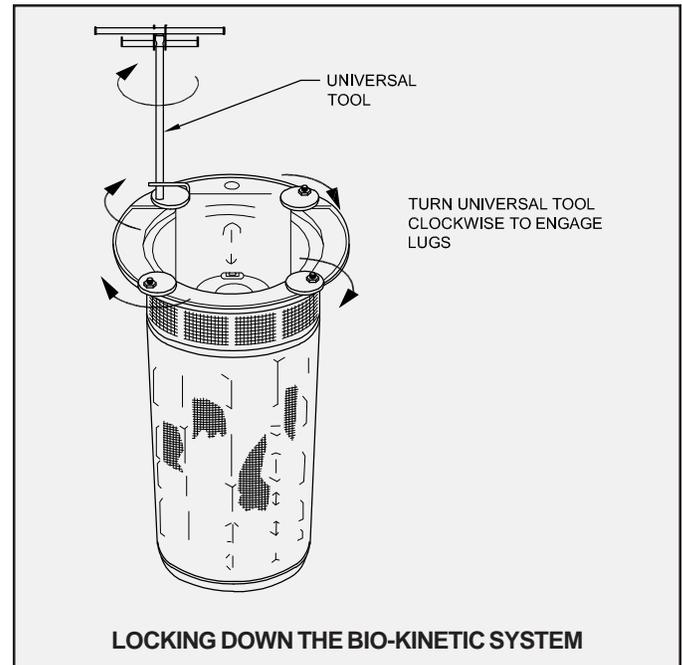
17. Remove the discharge flange assembly and internal components from the exchange Bio-Kinetic system. Lubricate the grommet in the outlet opening of the Bio-Kinetic system. From the inside of the contact chamber, insert the male threaded flange through the grommet. Reinstall the gasketed discharge flange on the Bio-Kinetic system by turning it clockwise until tight. Reinstall the flow deck and internal components into the contact chamber. Apply lubricant to the exterior surfaces of the gasketed discharge flange.

## CLARIFICATION AND BIO-KINETIC® SERVICE (Page 4 of 6)



18. Remove the internal components from the replacement Bio-Kinetic system and set aside. Use the universal tool to lower the exchange Bio-Kinetic system outer chamber into the mounting riser. Carefully insert the tip of the drain valve actuating tool through the drain valve located in the bottom of the outer chamber of the Bio-Kinetic system. This will allow the Bio-Kinetic system to fill with water as it is lowered into position. If allowed to tilt, the Bio-Kinetic system could rub the edge of the access opening and damage the filter media. Align the discharge flange with the receiving flange. As the chamber is set into position on the ledge of the access opening, the Bio-Kinetic system discharge flange must engage the top of the receiving flange before proceeding.
19. Once in the proper position, carefully remove both the drain valve actuating tool and the universal tool. This will allow the drain valve to seal against the exterior bottom of the Bio-Kinetic system. Use the locking lug tool to twist each of the round, black locking lugs clockwise so that each of the lugs is rotated to the furthest extension point possible and is engaged in the molded locking slots of the mounting riser.
20. Reinsert the internal components from the replacement Bio-Kinetic system. Locate the level indicator mounted above the outlet of the Bio-Kinetic system flow distribution deck. The bubble should be resting squarely between the two lines in the clear plastic case. If the location of the bubble indicates the system is not installed in a level position, the flow deck should be leveled using the four adjustment lugs provided for this purpose. With the ratchet drive, extension and  $\frac{7}{16}$ " socket from the Tool Kaddy, turn each of the adjustment lugs until the bubble comes to rest squarely between the two lines in the clear plastic case.

**NOTE:** Leveling of the flow distribution deck is essential for proper operation of the flow equalization ports, chemical feed tubes and effluent weir within the Bio-Kinetic system.



21. Remove the Bio-Kinetic system outlet sealing tool from in between the system outlet flange and the receiving flange of the Singulair Green tank.
22. The system service cover with information tag from the originally installed Bio-Kinetic system must be reinstalled in the tank. Install the cover, handle side up, by aligning the four holes in the cover with the four locking lug bolts. Be sure the optional chlorination and dechlorination feed tube access openings are in the proper position. The cover will come to rest on the collar of the Bio-Kinetic system. There is no need to add fasteners to the locking lug bolts.
23. If the installation requires effluent disinfection, the chlorine feed tube opening in the service cover must be positioned on the inlet side of the system nearest the aerator mounting riser. The Bio-Kinetic system chlorine feed tube should be filled with Norweco Blue Crystal disinfecting tablets. Blue Crystal tablets have been specially formulated for use in the Bio-Kinetic system, other disinfecting chemicals will not provide the same results. Before handling Blue Crystal disinfecting tablets, carefully read the container

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# SINGULAIR GREEN® BIO-KINETIC®

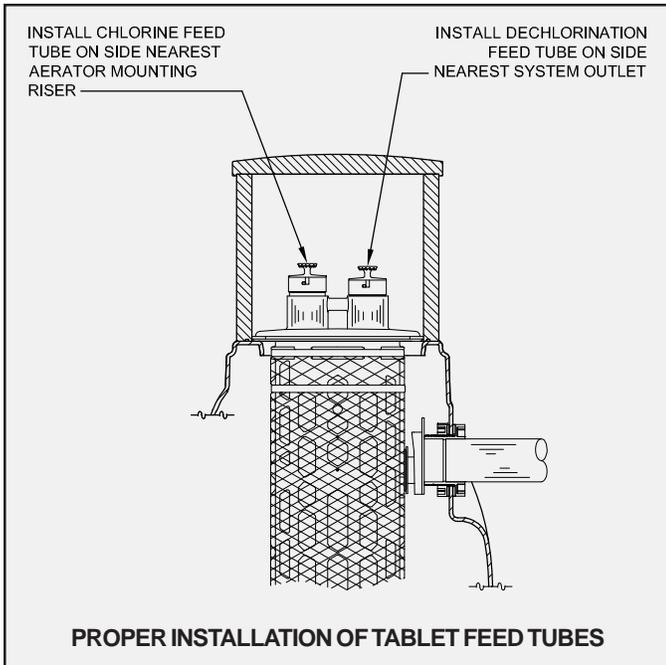
## WASTEWATER TREATMENT SYSTEM

### CLARIFICATION AND BIO-KINETIC® SERVICE (Page 5 of 6)

label and the "Warning" section of these instructions. To fill the chlorine feed tube, remove the cap, hold the tube open end down with one hand and insert Blue Crystal disinfecting tablets, one tablet at a time, until the tube is filled. The tube holds approximately a six-month supply and each tablet must lie flat in the stack. When the tube has been completely filled, replace the cap. Install the feed tube, slotted end down, through the plastic collar molded into the top of the Bio-Kinetic system service cover. The feed tube will begin to engage the round recess in the flow distribution deck. Rotate the tube clockwise until it locks into position.

*either safety goggles or a face shield when handling Blue Crystal disinfecting tablets or working with the chlorine feed tube. Keep tablets out of the reach of children, as they can cause skin and eye damage, be irritating to the nose and throat, and may be fatal if swallowed. Avoid breathing dust and do not allow contact with eyes, skin or clothing. Contaminated clothing should be removed and washed before reuse. If tablets or residue contact skin, wash with plenty of soap and water for fifteen minutes. If irritation continues, call a physician. If swallowed, immediately drink large quantities of water, do not induce vomiting, avoid alcohol and get medical attention immediately. If inhaled, immediately remove victim to fresh air. In case of fire, apply liberal quantities of water. It is a violation of Federal law to use Blue Crystal disinfecting tablets in a manner inconsistent with the instructions printed on the storage container label.*

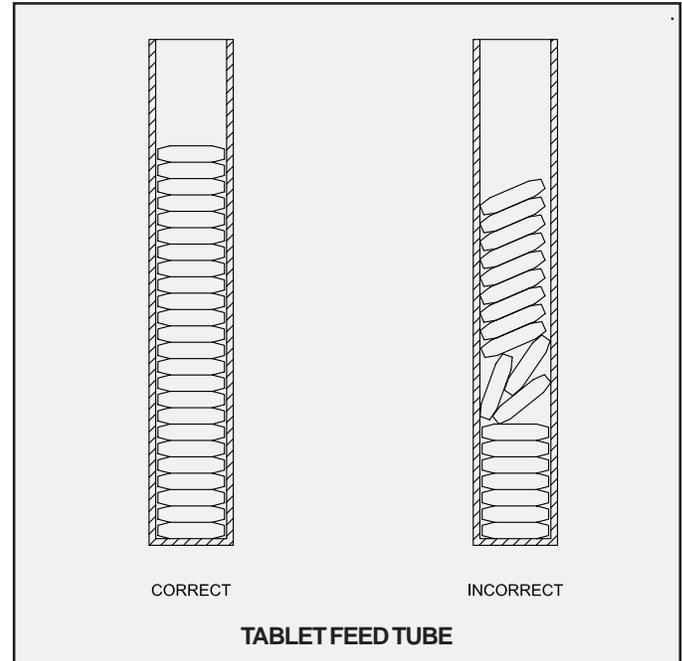
24. If the installation requires effluent dechlorination, the Bio-Kinetic system will be supplied with a dechlorination feed tube. To fill the dechlorination feed tube, remove the cap, hold the tube open end down with



**NOTE:** The chlorine feed tube must always be installed through the mounting collar nearest the aerator mounting riser. If the installation requires disinfection and dechlorination, there will be two feed tube mounting collars molded into the protective cover. The dechlorination feed tube must be installed nearest the system outlet.

#### WARNING

*Blue Crystal disinfecting tablets are a strong oxidizing agent and highly corrosive. Tablets should be stored in a cool, dry, well-ventilated area away from combustible materials such as paper, petroleum products, chemicals, rags or cardboard. Tablets should be mixed only with water. Contact with other liquids or chemicals may cause fire. Wear rubber gloves and*



one hand and insert the Bio-Neutralizer dechlorination tablets, one tablet at a time, until the tube is filled. The tube holds approximately a six-month supply of tablets and each tablet must lie flat in the stack. When the tube has been completely filled, replace the cap and insert the dechlorination feed tube, slotted end down, into the mounting collar closest to the system outlet. The bottom of the tube must come to rest evenly on the floor of the flow distribution deck.

# CLARIFICATION AND BIO-KINETIC® SERVICE (Page 6 of 6)

## WARNING

*Bio-Neutralizer dechlorination tablets must be stored in a cool, dry place away from acids and oxidizers. Do not allow Bio-Neutralizer tablets to come into contact with chlorine tablets. Although not rated a hazardous material by the USEPA, exercise caution when handling and wash skin thoroughly with soap and water if contact occurs.*

25. Reinstall the clarification chamber access cover. If the installation requires effluent disinfection and/or dechlorination, note the quantity of tablets installed on the Service Inspection Card in order to properly invoice the customer for the appropriate chemical tablets. Clean and store all tools and supplies.
26. When the service is complete, confirm the selector switch in the control center is in the "on" position. Close the cover of the control center enclosure and secure it with a new tamper evident seal.

## EFFLUENT DISPOSAL SYSTEM CHECK

1. Determine if the effluent from the Singulair Green system is being carried to an outlet for surface and/or subsurface discharge, or if it is being disposed of on lot. Inspect the condition of the effluent disposal system and make appropriate notations on the Service Inspection Card.
2. Although the Singulair Green system effluent may be discharged and/or disposed of in several acceptable fashions, there should always be a ground water relief point installed in the effluent line. It should be located at a point no higher than the outlet invert of the Singulair Green tank. It will prevent flooding in cases where the disposal line is submerged or saturated with ground water. Locate the ground water relief point and be sure that it is free of obstructions.
3. Locate the point of discharge closest to the Singulair Green system outlet. A free-falling "grab" sample of effluent can be collected after the point of discharge has been thoroughly cleaned. Take note of effluent color, odor and the presence or absence of suspended particles. Accumulation of mud in the effluent disposal line or at its outlet can be a sign of a crushed or broken effluent line and should be reported to the owner. Foaming, odor or particulate sediment indicates that the Singulair Green system has not been providing adequate treatment. Recheck the entire system by using the Singulair Green Troubleshooting guide.

**NOTE:** An effluent "grab" sample allows a visual assessment and should only be used in conjunction with routine service and/or troubleshooting procedures to accurately evaluate system operation. A "composite"

sample, collected over 24 hours of system operation, preserved and transported using USEPA established procedures, is necessary if laboratory analysis of the effluent is to be performed. Laboratory analysis of an effluent "grab" sample can lead to misleading conclusions about system operation and should not be conducted. For further information regarding proper evaluation techniques for sampling onsite systems, refer to the Norweco Technical Bulletin EFFLUENT SAMPLING TECHNIQUES FOR RESIDENTIAL TREATMENT SYSTEMS.

4. Make appropriate notations on the condition of the plant effluent and disposal system on the Service Inspection Card.

## BEFORE YOU LEAVE THE FACILITY...

1. Make sure that both sides of all three Service Inspection Cards are properly and completely filled out, including any specific notes or special services that your inspection indicates are needed.
2. Leave the top section of the Service Inspection Card with the owner and provide a brief verbal explanation of the condition of the system. Advise when to expect your next routine visit and provide your business card with office phone number, should the owner have any questions.
3. Point out the advantages of a continued service policy with your company if the warranty or current service policy is nearing expiration.
4. Explain that the Singulair aerator is set to operate on a time cycle and should not be turned off even during extended periods of non-use. Explain also that the Service Pro control center contains no user-serviceable parts and that the cover is secured with a tamper evident seal both for owner protection and protection of component parts.
5. Review the operation of the red warning light and audible alarm on the Service Pro control center with the owner. Inform the owner that the control center should be checked daily to insure proper system operation. Explain that if the light flashes and the alarm sounds, it could be due to temporary high water or electrical power fluctuation and that the reset button should be pushed to see if normal operation is resumed before requesting special service.

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# ***norweco***® **SINGULAIR**®

## BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

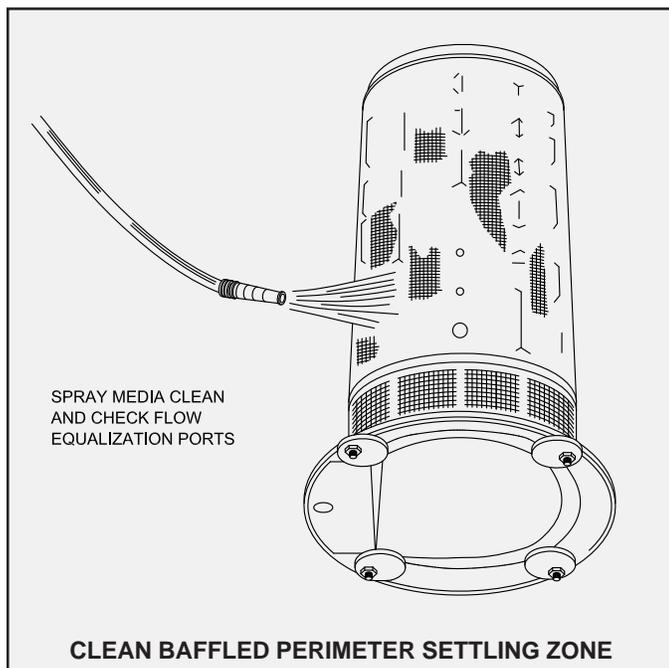
# CLEANING AND DISASSEMBLY INSTRUCTIONS FOR THE BIO-KINETIC® SYSTEM

### EQUIPMENT REQUIRED FROM THE BIO-KINETIC SYSTEM TOOL KADDY

- water hose and spray nozzle
- Bio-Kinetic system universal tool
- rubber gloves
- safety face shield or goggles
- ratchet drive and  $\frac{7}{16}$ " socket

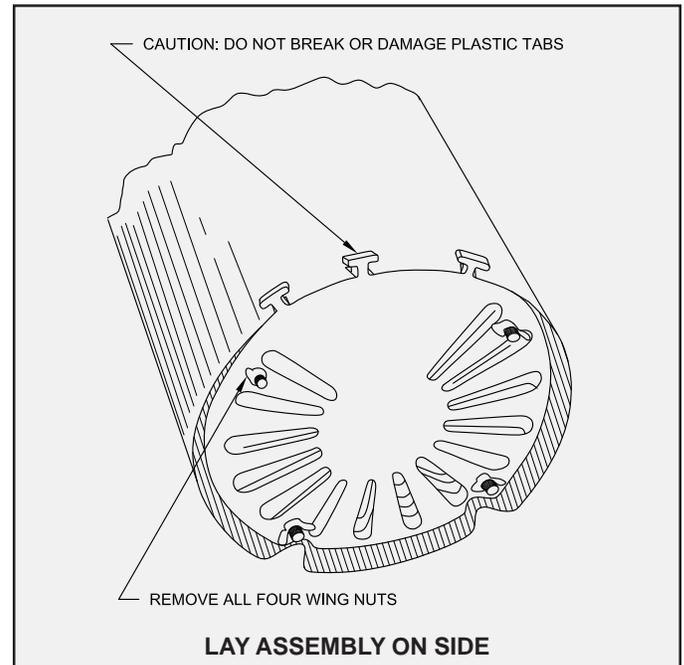
A fresh water supply and sewer drain are required for cleaning the Bio-Kinetic system.

1. Remove the Bio-Kinetic system from the service container. Rinse the container and lid. Rotate the four locking lugs to the outboard position on the Bio-Kinetic system. Remove the gasketed discharge flange assembly from the flow deck and rinse it with water.
2. Grasp the top flange of the system with one hand and insert the disassembly tool beneath each of the strap handles on the flow deck. Pull up on the disassembly tool to remove the flow deck and internal system components from the contact chamber and set aside. Use the water hose and spray nozzle to wash the inside of the contact chamber.
3. Use the water hose and spray nozzle to wash off the



filter media. Continue spraying until all sludge and wastewater have been flushed from the media. Invert the filter assembly and flush accumulated material from the baffled perimeter settling zone. Inspect the perimeter settling zone to be certain that it is totally clean. Check the flow equalization ports to be sure they are clean and unobstructed.

4. Wash off any debris that has accumulated on the surface of the flow distribution deck and baffle wall shroud. Lay the assembly down on its side and



remove the four wing nuts on the bottom. Remove and wash the bottom deck plate.

**CAUTION: Do not break or damage the molded plastic tabs on the edge of the bottom deck plate.**

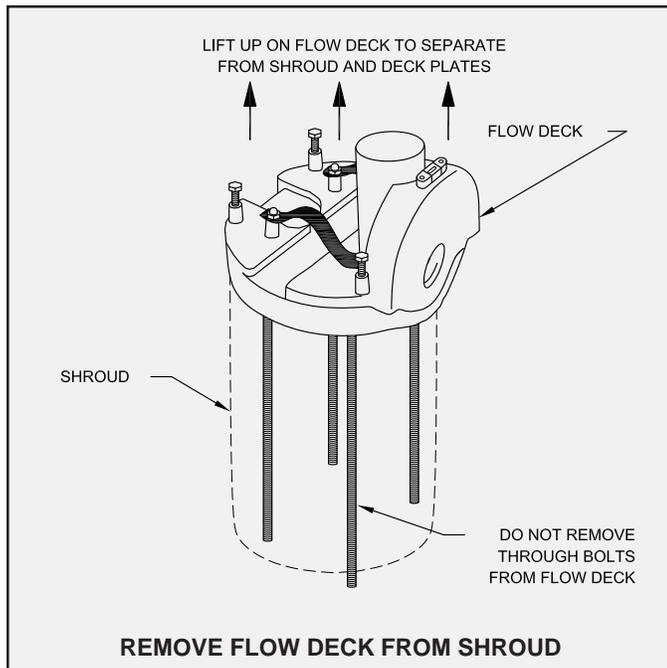
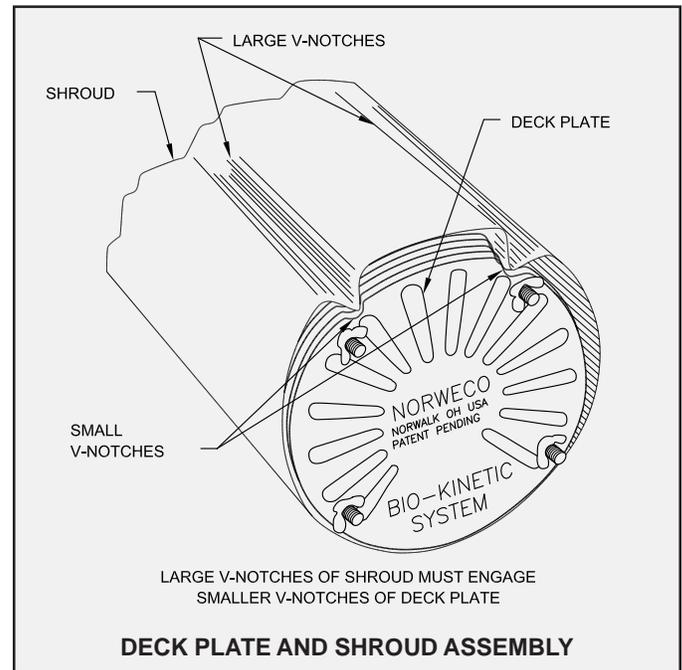
Do not remove the remaining deck plates at this time. Stand the assembly upright and lift up on the flow distribution deck to separate it from the baffle wall shroud and deck plates. You may find it helpful to hold the baffle shroud between your feet when lifting up on the flow deck.

**NOTE:** The through bolts will be removed from the shroud and deck plates when the flow deck is lifted off the baffle

# BIO-KINETIC® SYSTEM CLEANING AND DISASSEMBLY INSTRUCTIONS (Cont.)

wall shroud. Do not remove the through bolts from the flow distribution deck. Rinse the flow distribution deck thoroughly inside and out. Inspect the weir and final discharge zone to be sure they are completely clean.

5. Lift up the baffle wall shroud to remove it from the deck plates. Rinse the inside and outside of the shroud and set it aside. Take the cleaned, round bottom deck plate and set it on the floor with the engraved name facing down.
6. Remove the top deck plate from the remaining stack and wash off both sides. When cleaned, set it on top of the cleaned, round bottom deck plate. Repeat this procedure with each deck plate until all plates are cleaned and reassembled into a single stack. Each deck plate is molded with four circular depressions in the bottom side of the plate and four round stand-off posts in the top side of the plate. When restacking the clean deck plates, make sure the four depressions on the bottom engage the top of the four posts below. All



deck plates must be placed onto the stack baffle side up (engraving down). When properly assembled, all edges of each plate should be vertically aligned.

7. Lower the baffle wall shroud over the assembled stack of deck plates. The two large V-notches in the shroud should engage the smaller notches on the edge of the deck plates. Check the four leveling lugs on the flow deck. They must be unscrewed until they are flush with the bottom of the flow deck. Now position the flow distribution deck above the baffle wall shroud so that the outlet of the flow distribution deck is directly opposite the two large V-notches in the shroud. Insert each of the four through bolts through the holes in the top of the baffle shroud and into the stack of deck plates. Lower the flow distribution deck until it fully engages

the top of the baffle shroud. Push each through bolt down into the assembly as far as it will go.

8. Lay the assembly on its side and push the through bolts through the bottom deck plate. Fasten a wing nut to each of the four through bolts where they project through the bottom deck plate. While tightening each wing nut, make sure the molded plastic tabs on the bottom deck plate engage the slots on the edge of the shroud. Tighten enough to insure all three tabs are fully engaged into the three slots in the shroud.
9. Lubricate the grommet in the outlet opening of the contact chamber. Grasp the strap handles and lower the flow deck and internal components into the cleaned contact chamber making sure to align the flow deck outlet with the outlet of the contact chamber. Apply a moderate amount of downward force until the outlet of the flow distribution deck aligns with the outlet of the contact chamber.
10. Place the assembled Bio-Kinetic system back into the cleaned service container. Place the discharge flange assembly onto the flow distribution deck. Now place the service container cover into position by aligning the four holes in the cover with the locking lug bolts. Add a wing nut to each of the lug bolts to hold the cover in place. Return the container to your service stock.

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