W A S T E W A T E R

T R E A T M E N T S Y S T E M S

MANUAL
FOR
OPERATION AND MAINTENANCE
AND
TROUBLESHOOTING GUIDE

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I. BASIC OPERATION AND MAINTENANCE REQUIREMENTS

The following is a description of the normal maintenance required to insure continuous satisfactory operation of the ***NAYADIC*** systems:

START UP:

Allow 6-8 weeks for sufficient numbers of bacteria to develop in the ***NAYADIC*** in order to provide proper treatment of the wastewater. During this period there may be some sudsing due to laundry wastes. *The sudsing can be decreased by reducing the number of loads done at one time and by using a low sudsing detergent.* In situations where excessive grey water is expected, it may be necessary to seed the ***NAYADIC*** with mixed liquor from another aerobic waste treatment plant. To prevent short-term hydraulic overloads, homeowners should be advised to spread out laundry during this period.

PUMPING EXCESS SOLIDS:

Due to normal accumulation of inorganic solids and dead bacterial cells it is necessary to pump out the excess solids periodically in order to maintain adequate aeration capacity. For a typical single family residence, the ***NAYADIC*** will require pumping at 2-4 year intervals. ***NAYADIC*** representatives should advise customers when the ***NAYADIC*** should be pumped. On heavily used systems or residences with garbage disposals, the provision of a trash trap will reduce pumping frequencies.

COMPRESSOR REPLACEMENT:

The normal life expectancy of the compressor is 3-5 years. For all new installations, there is a two-year warranty on the compressor. For replacement compressors, there is a two year warranty period. Compressors can also be repaired and/or rebuilt.

ALARM:

The ***NAYADIC*** alarm system indicates both loss of air and high water conditions. To prevent unnecessary maintenance costs, the homeowner should contact the service representative as soon as the alarm is activated or unusual odors are noticed.

SERVICE CONTRACT:

The ***NAYADIC*** system requires periodic servicing to prevent major operational difficulties. With the purchase of each ***NAYADIC***, the owner receives a two-year service contract that provides warranty on all parts and service, including a minimum of two inspections of the unit each year. After the initial two years of operation, the homeowner is urged to maintain a service contract to insure regular inspection and service of the ***NAYADIC*** system.

REPLACEMENT PARTS/SERVICE:

Contact the factory for the name of the closest sales/service representative.

Start up period ..... 6-8 weeks after sewage first enters unit

Pumping frequency ..... 2-4 years

Compressor replacement..... 3-5 years

Routine inspection frequency..... every 6 months or as required by state/local regulatory authorities

NOTE: Due to differences in raw wastewater strength, increased user abuse and hydraulic surges, additional pre-treatment facilities and/or increased maintenance may be required on non-residential or commercial facilities. Please check with your ***NAYADIC*** representative.

II. EQUIPMENT AND MATERIAL ESSENTIAL FOR SERVICING THE NAYADIC SYSTEM

100' garden hose with spray nozzle

100' extension cord

1/4 hp submersible pump with outlet made of flex pipe.

Small utility pump with 1/2 - 5/8" garden hose (6') on inlet and outlet (Teal model IP 579E, Simer Minivac Model M40 or equal.)

Pliers - standard with insulated handles

Pliers - channellock

Caulking gun

Caulking, silicone

Hammer

Electrical tape

Wire nuts

Knife

Screwdriver

Replacement parts:
- compressor
- diffusers
- compressor repair kit
- pressure switches, high level float switch (alarm)
- alarm

Wiping rags

Sample collection jars (quart size)

Volt ohm amp meter

Allen key for lid

III. PROCEDURES FOR ROUTINE INSPECTION AND MAINTENANCE

The ***NAYADIC*** system requires routine, periodic inspection and maintenance to insure continuous, trouble-free operation. At a minimum, the ***NAYADIC*** should be inspected every six (6) months, assuming it is serving a typical single family residence. More frequent inspections may be required if mandated by local or stated regulatory authorities; or, if the ***NAYADIC*** is used on a non-residential application.

During the routine inspections, the following items are checked:

COMPRESSOR

1. Check filters for cleanliness. Replace if the filters are dirty or clogged.
2. Check housing and air line fittings for signs of overheating.
3. Check for air leakage at fittings or in air supply line.
4. Check for excessive noise or vibration.
5. Check for moisture or mud accumulations which could indicate possible flooding or direct rainfall on compressor.
6. Check air flow (with gauge), especially if odors or septic conditions are observed. A minimum of 3.0 cfm should be provided on all models <u>except</u> the M2000A.
7. Check carbon vanes for excessive wear. Replace as needed (approx. 2-3 years).

ALARM

1. Check “test” button to insure proper operation.
2. Check alarm function by raising float in tank.
3. Check alarm function by disconnecting airline union in tank.

TREATMENT PLANT AERATION CHAMBER

1. Check for presence of septic odor.
2. Check for color of aeration chamber contents.
3. Check for excessive sudsing or foaming.
4. Check for excessive accumulation of grease balls and non-biodegradable material. Using a wire skimmer basket, remove such material and dispose of it in a proper manner.
5. Check air supply at aeration chamber, especially if odors or septic conditions exist. Air check can be performed by observing amount of turbulence; or, by using an air flow meter. If necessary, check diffuser for clogging.

6. Check aeration chamber solids (MLSS) by collecting a sample of aeration chamber contents while compressor is running. Observe rate of settling, volume of settled solids and clarity of supernatant.

CLARIFICATION CHAMBER

1. Check color and depth of scum layer.
2. Check color and clarity of effluent. An effluent check can be done by running water from a garden hose into the aeration (center) chamber.
3. Check level of effluent weir.

MISCELLANEOUS ITEMS TO BE CHECKED

1. Check access cover to insure that it is properly fastened.
2. Check all peripheral equipment such as chlorinators, dosing pumps, filters, etc.
3. Check effluent disposal system.
4. Check compressor housing if installed outside. The housing should be adequately fastened over the housing; be well ventilated and protect the compressor from direct rainfall.

LABORATORY OR FIELD TESTS

Normally, laboratory testing is not required for the routine operation and maintenance of the ***NAYADIC*** system. Occasionally testing may be necessary to identify the source of an operational problem or to satisfy the requirements of the state or local regulatory agency.

SAMPLE COLLECTION

The ***NAYADIC***, when properly sized and maintained, will produce an effluent exceeding the performance requirements of NSF Standard 40 (Class I) for aerobic treatment plants: 30 day average of <25 mg/l CBOD and <30 mg/l TSS.

To collect sample from the ***NAYADIC***, care must be taken to get a reliable and uncontaminated sample of the **effluent that is being discharged from the plant at the time of the sampling.** To accomplish this, the following steps must be taken:

1. Provide a suitable sampling port on the outlet of the ***NAYADIC*** (see Fig. 1). The port should be at least 6” in diameter, with a minimum depth of 8” below the effluent line.
2. Using a clean cloth, wipe the interior of the effluent line where it enters the sampling port. This is to remove any debris that may have accumulated.
3. By opening a faucet or inserting a garden hose into the cleanout before the ***NAYADIC***, generate a flow through the plant. Allow the flow to continue for approximately one (1) minute in order to flush the line.
4. Shut off the water and dip the water out of the sampling port.
5. Turn on the water and collect a sample as the plant effluent flows into the sampling port. Do not collect water that has accumulated in the sampling port. Care needs to be taken to avoid catching dirt or other debris while collecting the sample.

Fig. 1

Treatment Plant Effluent →

→ To Disposal

IV. MAINTENANCE PROCEDURES: Pumping (wasting) sludge

Bacteria and other microorganisms present in the wastewater utilize the soluble organic material as a food source, converting it into a non-soluble mass. This non-soluble mass or floc is comprised of living microorganisms, sewage particles, as well as inert (non-biodegradable) material. As the process matures, the numbers of micro-organisms increase until there is an adequate biomass to metabolize or digest all of the soluble organic material in the incoming sewage. At this point, competition for food results in the dying (due to starvation) of organisms as new organisms are formed. These dying organisms, in turn are metabolized, thereby reducing the overall sludge volume.

The volume of solids will gradually increase due to the accumulation of the inert remains of dead organisms (ash), combined with the non-degradable material in the raw wastewater. As the solids increase, the mixed liquor (i.e., contents of the aeration chamber) becomes thicker, developing an increasing darker brown color. Periodically, the excess solids must be pumped (wasted) from the ***NAYADIC*** in order to insure continued plant efficiency.

PUMPING FREQUENCY

The rate at which the solids (biomass) accumulates in the ***NAYADIC***, and the subsequent rate at which the excess solids must be pumped out, is dependent upon the total volume and strength (i.e., BOD) of the wastewater entering the plant. The typical residential system will need to be pumped every 2-3 years. Commercial systems or systems that receive close to their design loading may need to be pumped every 1-2 years. Conversely, weekend cottages or systems serving only 1 or 2 people may go 4-5 years or longer.

DETERMINING PUMPING FREQUENCY

In order to insure optimum treatment efficiency and effluent quality, it is necessary to maintain the level of aeration solids (MLSS) within a suitable range (refer to Operational Control Chart). A low level of solids in the aeration chamber (i.e., during the plant start-up) reduces the treatment plant's ability to provide adequate treatment during peak operating periods. Excessive solids, on the other hand, may result in poor settling during periods of hydraulic surges; or, in the development of septic conditions in the plant. In order to determine when the ***NAYADIC*** system should be pumped it is necessary to perform a settleable solids test (30-minute) during each semi-annual service check:

Procedure:

1. Mark a quart jar into 10 equal portions.

2. While the compressor is running, fill the jar with the liquid (MLSS) from the aeration chamber. This sample should be collected at mid-depth in the tank. **Do not collect a sample from within the draft tube**.
3. Allow the sample to sit for 30 minutes. If the sample settles slowly, allow it to sit for 24 hours in order to insure complete settling.
4. Measure the volume of the settled sludge as a percentage of the total volume of the sample. Occasionally, after the sample sits, a portion of the settled sludge may float to the top of the sample. If this occurs, add together the volume of settled sludge and the volume of floating sludge.
5. Compare the percent of settled sludge (i.e., sludge volume) to the figures given in the "Operational Control Chart". The optimum level of settleable solids is normally between 5-50%. Whenever the sludge volume exceeds 50%, the plant should be pumped.

PROCEDURE FOR PUMPING THE NAYADIC

1. Remove 30" access cover.
2. Carefully lower the pumper hose into the inner (aeration) chamber. Slide the hose down the wall of the inner tank until it rests on the bottom of the outer tank (clarifier). **Do not insert the hose down the draft tube unless the airline and diffuser are removed.**
3. Pump solids from the bottom of the outer tank. This will lower the liquid level in both the inner tank and outer tank simultaneously.
4. As the liquid level drops, the scum layer between the inner tank and scum baffle will normally break loose and drop to the bottom of the tank where it can be pumped out. With a garden hose, flush any remaining scum or residue to the bottom of the tank. **If the scum layer is more than 2" thick, it should be removed first.**
5. **In areas with a high-water table, immediately re-fill the tank with clear water to prevent shifting or floatation.**

SLUDGE CHARACTERISTICS

It is important to observe the MLSS (mixed liquor suspended solids) sample that is collected from the aeration chamber. As the sample settles you should note the following:

1. What is the color of the sludge?
2. Do the sludge particles clump together in a dense floc, which settles rapidly?
3. Is the liquid above the settled sludge (supernatant) clear?
4. Does the sample have a noticeable odor?

A good healthy sludge should have a chocolate brown color. It should form a dense floc that settles rapidly leaving a clear, odorless supernatant. A sludge sample that has a grey/black color, settles slowly, has a cloudy supernatant, or has a supernatant containing very fine, suspended particles, usually indicates poor treatment plant operation. Therefore, it is important to compare your observations of the ***NAYADIC*** plant, as well as the sample of mixed liquor suspended solids to the conditions described on the "Operational Control Chart" to determine if the plant is operating properly or if any corrective action needs to be taken.

V. COMPRESSOR REPLACEMENT

Procedure:

1. Disconnect power before working on compressor.
2. Remove the compressor housing if located outside.
3. Disconnect the airline from the compressor air discharge fitting.
4. Disconnect the compressor's power cord from the electrical service line that goes to the alarm.
5. Remove the compressor.
6. Take the new compressor out of its packing carton. Remove the plywood shipping base and assemble the base plate (foot support) in accordance with the enclosed directions. NOTE: Keep the box and shipping base to return compressor for warranty.
7. Transfer the air discharge fittings from the original compressor to the replacement unit.
8. Remove plug from the air intake opening and screw in air filter (supplied with compressor).
9. Set the new compressor in place and re-connect the airline and electrical power cord.
10. Replace the housing, if applicable.
11. Re-connect the power and check for proper operation (refer to Section 5.0)

VI. ALARM REPLACEMENT

Procedure:

1. Disconnect power before working on alarm.
2. Unscrew the faceplate of the alarm.
3. Remove the wire nuts and disconnect the following wires:
    a) black and white to float and pressure switch
    b) black, white and green to compressor
4. Remove the alarm faceplate and replace with a new alarm.
5. Reconnect the wires described in item 3.
6. Replace the faceplate and restore power to the alarm.
7. Check alarm by pressing test button and by raising float in the NAYADIC plant.

VII. PRESSURE SWITCH REPLACEMENT

Procedure:

1. Remove the housing from the compressor (if applicable).
2. Disconnect the two sensor wires from the old pressure switch.
3. Unscrew the pressure switch from the airline and replace with a new one.
4. Re-attach the two sensor wires.
5. Check alarm by shutting off the compressor.
6. Replace housing.

VIII. DIFFUSER REPLACEMENT

Procedure:

1. Remove the access lid on ***NAYADIC***.
2. Using a garden hose, wash down the interior surfaces of the center (aeration) tank and airline, including the union on the top of the airline.

3. Unscrew the union and remove the lower portion of the air supply line (with diffuser).
4. Unscrew the diffuser from the end of the airline and replace with a new one.
5. Re-install the airline being careful to insert the airline and diffuser into the draft tube.
6. Tighten union and check to insure that there is adequate turbulence in the tank.
7. Replace the access lid.

IX. FLOAT REPLACEMENT

Procedure:

1. Remove the access lid on ***NAYADIC***.
2. Using a garden hose wash down the interior surfaces of the center (aeration) tank, airline, float, cord and cable connectors.
3. Remove the wire nuts on the float cord and disconnect the two wires.
4. Loosen the clamp on the airline and remove the old float.
5. Replace with a new float, making sure that the float is set at the same distance from the clamp and that the clamp is fastened securely to the topside of the airline and away from the inlet pipe.
6. Reconnect the two wires of the float making sure to use approved water resistant wire nuts.
7. Check the alarm by raising the float.
8. Re-secure the access lid.

NAYADIC
TROUBLE-SHOOTING CHECKLIST

PROBLEM/CONDITION OBSERVED	***POSSIBLE CAUSE***	***CORRECTIVE ACTION***

(IMPORTANT: Disconnect power to compressor or alarm before attempting repairs.)

I. COMPRESSOR

A. New compressor will not start but motor hums when power is turned on.	1. Rotary assembly is locked up due to prolonged storage time.	1. Remove internal filters, muffler box and head plate. Using the palm of your hand turn the rotary assembly until it moves freely. Replace head plate, muffler box and filters.If motor still does not run, return to factory (***NAYADIC***).
B. New compressor runs but provides insufficient air pressure.	1. Internal filters are not properly tightened.	1. Tighten filters by hand. If this does not correct problem, return compressor to factory for repair or replacement.
	2. Kinked or crushed airline. Check with air flow meter at compressor and at ***NAYADIC*** tank to detect pressure loss.	2. Replace airline.
C. Compressor will not start (or hum) when power is turned on.	1. Breaker is tripped.	1. Re-set breaker. Check for other appliances connected to breaker.
	2. No power at electrical receptacle.	2. Check receptacle with voltage meter. If no voltage or low voltage, check with electrician.
	3. Wiring leads are not properly connected.	3. Check and reconnect if necessary.
	4. Power cord is cut or damaged.	4. Inspect cord for cut and test with meter for continuity. Replace if necessary.

PROBLEM/CONDITION OBSERVED	*POSSIBLE CAUSE*	*CORRECTIVE ACTION*
D. Used compressor does not run but motor hums.	1. Rotary assembly is locked up. This may occur if compressor is not in use for several days.	1. Remove internal filters, muffler box and head plate. Check carbon blades to see if they move freely. If not, clean blade path; check for broken carbon blades. If necessary replace using repair kit (N6508 or N6510).
	2. Rotary assembly is locked up. Compressor shows evidence of being exposed to excessive moisture	2. Remove internal filters, muffler box and head plate. Remove 2 allen bolts from cylinder and remove or flooding. cylinder shield. Clean rusted parts with light grit sand paper. Replace cylinder shield. Install repair kit (N6508 or N6510) If compressor still does not run, return to factory (***NAYADIC***). **CAUTION: Locate compressor in area protected from flooding.**
E. Used compressor runs but provides insufficient air pressure. (Check with air gauge).	1. Filters are clogged.	1. Remove and check both external internal filters. Clean or replace, if necessary. Provide protective enclosure around compressor to protect from dust if located in exposed area.
	2. Internal filters are not properly tightened.	2. Tighten by hand.
	3. Internal filter o-ring hard or cut.	3. Replace.
	4. Muffler box loose.	4. Tighten bolts

TROUBLE-SHOOTING CHECKLIST

PROBLEM/CONDITION OBSERVED	*POSSIBLE CAUSE*	*CORRECTIVE ACTION*
	5. Head plate loose.	5. Remove internal filters and muffler box. Tighten head plate bolts and reassemble
	6. Worn or broken blades in rotory assembly.	6. Disassemble and install repair kit (N6508 or N6510). If compressor still provides insufficient air pressure, return to factory for repair.
F. Compressor with old style alarm does not run.	1. ON/OFF switch of the alarm is in the "off" position.	1. Turn switch to "on" position. Re-set "test" button.
II. ALARM (New Installation)		
A. Light and buzzer do not come on when pressing test button.	1. Alarm is not properly energized	1. Check to make sure power cable is plugged into 115 vac outlet.
B. Alarm remains activated after TEST button is pressed. Compressor is running properly.	1. Float activated.	1. Make sure float is in down position.
	2. Faulty float.	2. Replace float.
	3. Pressure switch.	3. Check wiring, making sure connecting wires are on terminal #'s 1 & 2.
	4. Faulty pressure switch.	4. Replace pressure switch.
	5. Alarm is faulty.	5. Replace alarm.
C. Alarm is not activated when float is raised.	1. Float is not properly wired in alarm system.	1. Check wiring diagram provided and reconnect if necessary.
	2. Wiring connections are loose.	2. Tighten all wiring connections.
	3. Float is faulty.	3. Replace float.

TROUBLE-SHOOTING CHECKLIST

PROBLEM/CONDITION OBSERVED	*POSSIBLE CAUSE*	*CORRECTIVE ACTION*
D. Alarm is activated, but the compressor is operating properly and the water level is normal.	1. Float is set too low in ***NAYADIC***.	1. Raise float (alarm) so that it is at or slightly above the normal water level.
E. (Old Style Alarm) Alarm remains activated after TEST/RESET button is pressed. Compressor is running properly.	1. Alarm is improperly wired. Black wires marked “To 115 vac” and “To Compressor” are reversed.	1. Rewire alarm so that the black wire from the 115 vac is connected to the ON/OFF switch. The black wire from the compressor should be connected to the TEST/RESET button.
F. (Old Style Alarm) Light does not come on when pressing test button.	1. Alarm is not properly energized.	1. Turn ON/OFF switch to “on” position.
G. (Old Style Alarm) Compressor shuts off when float (in pump tank) is raised.	1. Float is improperly wired to black wires in alarm box.	1. Rewire float so that one wire from is connected to white (neutral) wire; and the second wire from the float is connected to the red wire.
III. AERATION CHAMBER (Inner Tank)		
A. Compressor is running but little or no turbulence is observed in aeration. chamber. Aeration contents have greyish (dishwater) appearance. Noticeable odor. Poor effluent quality.	1. Insufficient air supply due to compressor failure, Check with air flow meter.	1. Refer to Trouble-Shooting Checklist, Section I: A-E.
	2. Plugged diffuser.	2. Disconnect union on airline and remove lower airline with diffuser. Clean or replace diffuser.
	3. Loose connections on airline. Leakage of air at these locations is reducing air to plant.	3. Check and tighten all airline connections, including union and connections at the compressor and tank.
	4. Damaged airline. To determine, check	4. Expose airline and replace damaged

TROUBLE-SHOOTING CHECKLIST

PROBLEM/CONDITION OBSERVED	*POSSIBLE CAUSE*	*CORRECTIVE ACTION*
	with air flow meter at compressor and at plant for a drop in cfm.	or crushed sections.
B. Aeration chamber contents has a greyish-brown to black appearance. Slight to strong septic odor observed. Compressor is running and good turbulence is noted. Poor quality effluent has a grey color.	1. Heavy hydraulic surge flows due to excessive grey water discharges from laundry or kitchen activities. Generally this problem observed only on commercial applications. Residential systems will usually be characterized by light or sporadic usage comprised mostly of laundry.	1. For commercial applications, provide surge tank to eliminate surge flows. Residential systems may improve operation by reducing frequency of laundry to 1-2 loads per day. **NOTE: The use of a large pre-tank may increase the severity of the problem because of the shock load caused by heavy short-term water usage (ie., laundry).**
C. Aeration chamber has a clear appearance with very few solids (MLSS<5%). Effluent is clear, no odor. White suds observed in aeration chamber.	1. Light loading to ***NAYADIC*** resulting in complete oxidation (digestion) of solids in plant.	1. No action required if effluent is clear. Typical of intermittent use. (See also Section III - D).
D. Aeration chamber has the same appearance as III-C (above). However, the effluent is somewhat turbid. Settleable solids test indicates <5% solids with very fine suspended particles in supernatant.	1. Excessive aeration due to light loading of plant. Turbidity in effluent due to "ash" particles that settle very slowly.	1. Reduce air by providing timer on compressor. Settings should cause the compressor to run 2 hours and be off for 2 hours. **Contact factory before making this change.**
E. Aeration chamber has greyish appearance with a slightly septic odor. Systems has been in use for less than 6 months.	1. Oversized septic tank preceeding the ***NAYADIC*** causing slow start-up. This problem is more noticeable during cold weather.	1. Seed plant with 100 gal. of fresh activated sludge to help initiate start-up.
	2. Excessive surge flows (grey water) due to heavy laundry activities. (Problem	2. Spread out laundry and limit to 2-3 loads/day. Once the plant achieves

PROBLEM/CONDITION OBSERVED	*POSSIBLE CAUSE*	*CORRECTIVE ACTION*
	is worse when ***NAYADIC*** is preceeded by a large septic tank).	normal operation, the laundry usage may be increased somewhat. Extreme condition (or commercial application) may require flow equalization.
F. Aeration chamber has a grey, dishwater appearance. Effluent has a grey septic odor. Accumulation of grease balls are observed.	1. Organic overload due to excessive use of garbage disposal (See also cause #3 below).	1. Eliminate discharge of food scrap, grease, oil, etc. into garbage disposal.
	2. Excessive laundry usage.	2. See Section III-E corrective action.
	3. Insufficient air being supplied. The minimum air flow on all models except the M2000A should be at least 5.0 cfm. NOTE: Older M6A plants may have a Gast 323 compressor which would have a minimum air flow of 3.0 cfm.	3. Check airflow (cfm) at compressor and at ***NAYADIC***. If appropriate for specific Model, check dissolved oxygen in aeration tank. Shut off compressor 10-15 minutes before test. If DO is less than 1.0 ppm during peak usage period, contact factory for assistance.
IV. CLARIFIER (Settling Chamber)		
A. (Start-up) Effluent is slightly turbid or cloudy. Slight odor detected. Plant is in the first 3 months of operation. Excessive amount of white suds in aeration chamber.	1. Normal start-up period of 6-8 weeks is required to attain sufficient numbers of bacteria. During this period treatment efficiency may not be at its highest, especially during periods of hydraulic surge loading, (ie. laundry periods).	1. No major action is required. Reducing the frequency of laundry will help. Re-check plant in 4-6 months unless other problems develop sooner.
	2. Septic tank is installed prior to the ***NAYADIC***. This problem is usually apparent when the daily flow is light or when excessive laundry usage occurs.	2. Reduce frequency of laundry until plant achieves normal operation (6-8 weeks). Seeding the ***NAYADIC*** with 100 gallons of fresh "activated" sludge may reduce start-up period.

TROUBLE-SHOOTING CHECKLIST

PROBLEM/CONDITION OBSERVED	*POSSIBLE CAUSE*	*CORRECTIVE ACTION* Extreme cases may require the removal of septic tank.
B. Effluent has very fine suspended particles which settle slowly leaving a clear supernatant.	1. Over-aeration	1. Refer to Section III-D.
C. Effluent contains brown suspended solids. Condition is more noticeable during periods of heavy water usage. System has not been pumped in 2-3 years. Settleable solids test indicates sludge volume > 50%.	1. Heavy build-up of MLSS (mixed liquor suspended solids) due to normal, long-term usage.	1. Pump ***NAYADIC***. Refer to "Maintenance Procedures: Pumping (wasting) sludge".
D. Excessive (>5 inches) of scum has accumulated in 6-12 months of use. Grease balls may be observed in aeration chamber. System requires pumping on a frequent basis.	1. Over-use (or abuse) of garbage disposal.	1. Discontinue dumping grease, food scraps, etc. into the disposal. This material should be put in garbage can.
	2. Excessive use of powdered laundry	2. Use liquid detergent or the detergent. "concentrated" powders.
E. Excessive (>5") of scum has accumulated In 6-12 months of use. Noticeable odor from scum layer. Aeration chamber has very low suspended solids (MLSS).	1. Settled sludge or inorganic solids (i.e., paper, trash, etc) may be restricting return of solids into aeration chamber. This may be caused by the draft tube being too close to the bottom Of the tank.	1. Contact the factory for advice and the proper equipment to shorten the draft tube. **This can be done without pumping the tank.**
F. Excessive solids carry-over with Effluent aeration chamber has Normal color but sludge (MLSS) Settles slowly, forming a light floc that does not compact. Most common with commercial (especially food service) facilities.	1. Overabundance of "filamentous" micro-organisms that prevent compaction and settling of sludge. The presence of these organisms should be confirmed by laboratory (micro-biological) examination.	1. Contact the factory for specific recommendations.