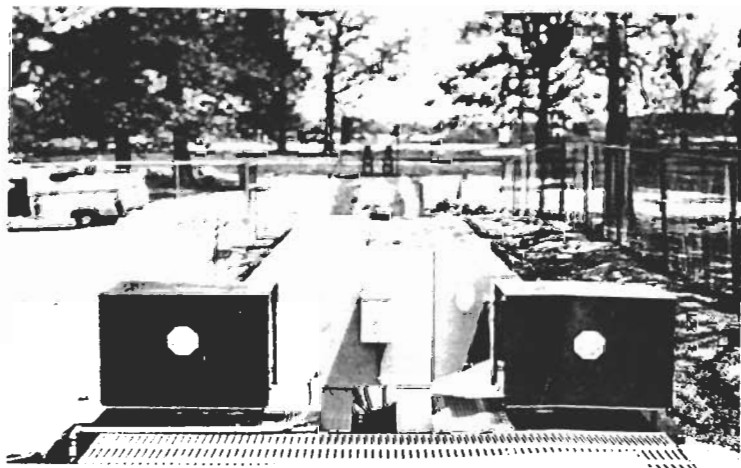
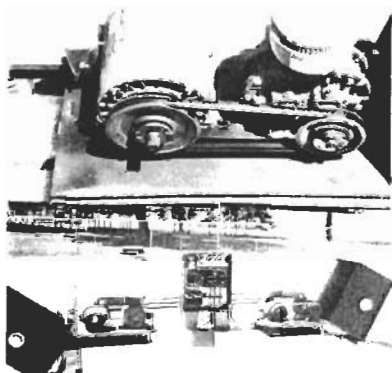
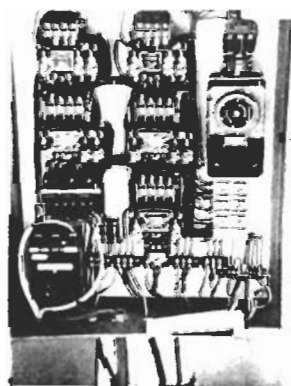
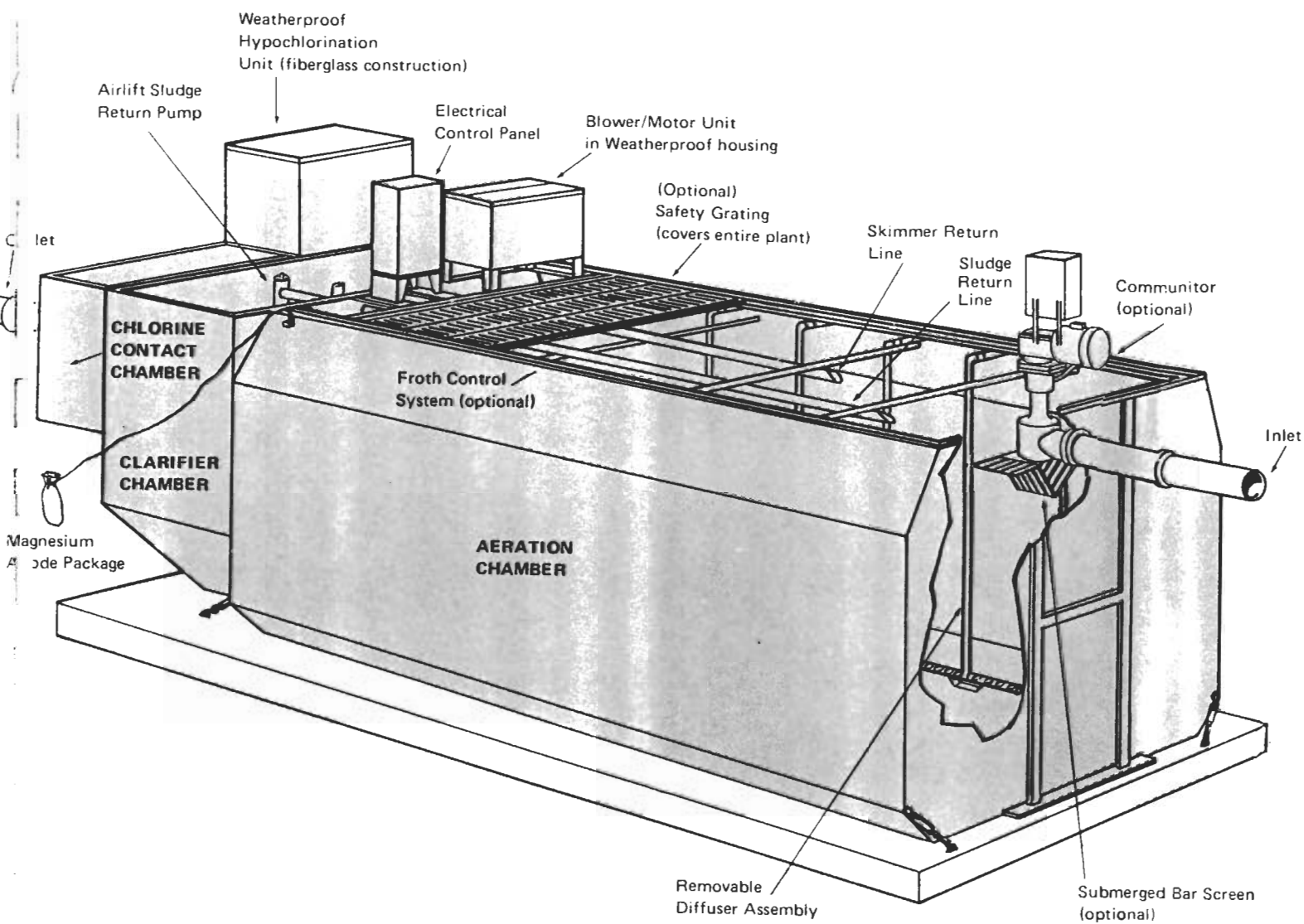


purestream package sewage treatment plants



Effective Treatment for . . .

- small municipalities
- subdivisions
- mobile home parks
- long-term
construction sites



purestream

Package Sewage Treatment Plants

Prefabricated Steel Construction

"USER DESIGNED" with YOU in mind

HOW DOES IT WORK

The PURESTREAM package sewage treatment plant is best described as an "Extended Aeration" treatment system. This treatment system works by providing ideal "living conditions" for aerobic bacteria and other micro-organisms; these micro-organisms then decompose the sewage.

The treatment plant provides the proper environment, sufficient oxygen and other elements which allow the bacteria to consume the organic matter (the Pollutational material) and live and multiply within the treatment plant. In this way the aerobic bacteria and microbes decompose the sewage and waste to a stable form - odor and nuisance free.

WHERE IS IT USED

The package sewage treatment plant is used to fill the gap between individual septic type systems and large municipal plants. They are used to provide sewage treatment for: subdivisions, mobile home parks, schools, recreational parks, nursing homes, factories and other commercial businesses in outlying areas without municipal sewer facilities.

CONSIDER THESE ADVANTAGES

CAN BE INSTALLED IN LESS THAN A DAY —

This is a completely pre-fabricated package unit — pre-assembled within shipping limitations. Auxiliary equipment requiring field mounting can be installed in a matter of hours.

ECONOMICAL TO OPERATE, EASY TO MAINTAIN —

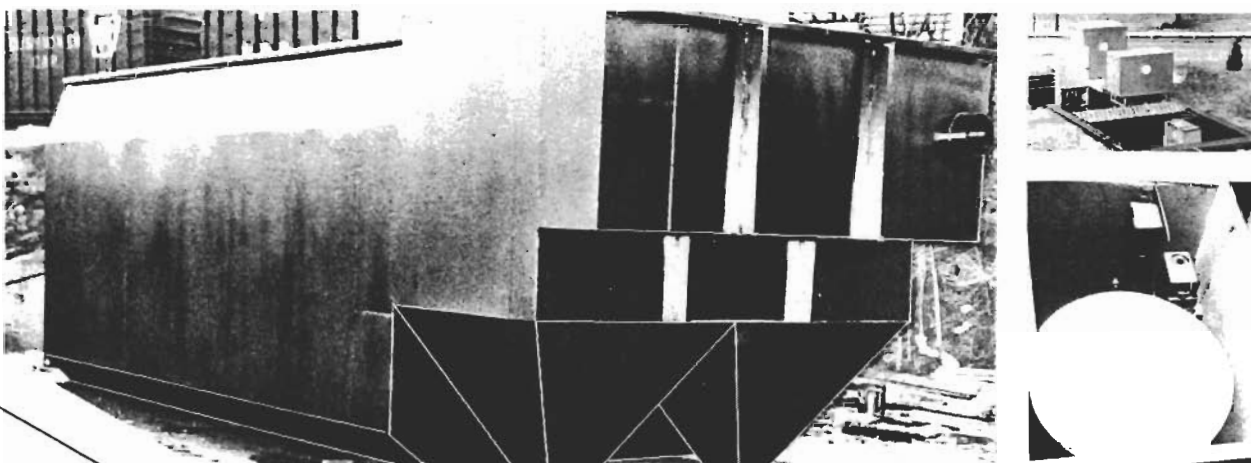
The PURESTREAM unit is "user designed" for ease and economy of operation. Immediate factory service is available at any time, day or night.

SIMPLE TO EXPAND

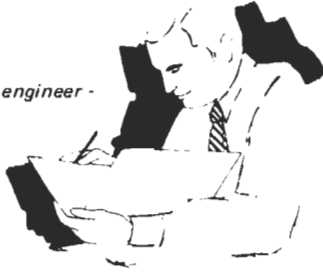
A duplicate PURESTREAM unit can be installed anytime in the future to handle the growing sewage load as your development expands.

HIGH RESALE VALUE

Due to the package design, a PURESTREAM plant can be sold as a used unit, or can be transferred to another site when the municipal sewerage systems expands to serve your development.



the consulting engineer -



"USER DESIGNED" with complete follow-up service keeps you in mind.

A Purestream plant is designed to meet the needs of your project and the requirements of your water pollution control authority. The Purestream man is not the salesman who only shows up at bidding time. The Purestream representative is there to provide you, the engineer, with preliminary plans and costs and to assist you in any way he can during the design of your project.

The Purestream plant comes to you as a complete unit, pre-piped, pre-wired and ready for installation. Where shipping regulations restrict over-size shipments, auxiliary components are delivered completely pre-assembled ready for mounting. At your request, a Purestream representative will be on hand to assist you during installation.



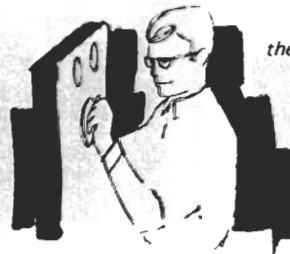
the installing contractor

the developer - owner -



The Purestream sewage treatment system is built to provide long life and easy, low-maintenance service. Bitumastic or other chemically resistant coatings, together with cathodic protection and simple to maintain accessory equipment provide long and trouble-free plant operation. In addition, due to the unique package design, anytime the plant is no longer needed it can be removed and resold to recover a good part of your investment. During the one year warranty period, operational assistance to your operator is free upon request. An operation or inspection contract is available at anytime.

The personnel of Purestream have spent over 10 years in improving the operation of package sewage treatment plants. The unique wet grinding comminutor, package fiberglass chlorination unit, the self-washing bar screen, and the simple pre-wired electrical controls are just some of the features which make this Purestream plant simple to operate. A Purestream representative will be there to start up the plant and instruct the person who is to operate it. A written manual of operation will be provided. A Purestream man is available whenever problems occur to correct the problem and further assist you, the operator.



the plant operator

REPRESENTED BY:



purestream inc.

WASTEWATER TREATMENT EQUIPMENT

P. O. BOX 68
FLORENCE, KY. 41022-0068
PHONE (606) 371-9898
FAX (606) 371-3577

Your Purestream sewage treatment system is based on the extended aeration method of sewage treatment. This method of treatment consists basically of four operations: (1) Screening, (2) Aeration, (3) Settling, (4) Chlorination. Additional treatment operations may be required depending on the local conditions and requirements.

- (1) Screening - When the sewage first enters the plant, it passes through a screening device. There are three types of screening devices used. You will be concerned only with the type used in your plant.
 - a. Trash Trap - A small primary tank designed to trap inorganic solids such as rags, leaves, sticks and grease.
 - b. Bar Screen - A series of bars welded to a frame with approximately one inch spacing between bars.
 - c. Comminutor - A mechanical grinder or cutter designed to cut or shred large solids. Smaller particles can be more readily digested by the bacteria in the aeration tank.
- (2) Aeration - From the screening device the sewage passes into the aeration tank. In this tank the sewage is decomposed by aerobic bacteria and other organisms in the presence of air (aerobic conditions). In a properly operating plant, these micro-organisms (that's a rather technical term, we call them "bugs") will form a dark brown mass called activated sludge which is mixed with the incoming sewage. This is done by introducing air along one side of the tank near the bottom air diffusers, thereby setting up mixing currents within the liquid and maintaining an adequate air supply to allow the organisms to decompose the sewage into carbon dioxide and water and other minor constituents. The air is provided by a rotary blower housed in a metal structure mounted atop the settling tank, the air is piped through air header pipes to the diffusers at the bottom of the aeration tank. A second blower for stand-by service may be provided. Each blower is usually equipped with a fifteen minute interval timer to control the amount of air supplied. The aeration tank is usually designed to provide a volume equal to the total twenty-four hour flow.

A spray system to retard foam sometimes created by this mixing action is sometimes provided in the aeration tank. This consists of a submersible pump located in the settling tank discharging treated sewage through spray nozzles spaced along the wall of the aeration opposite the air diffusion equipment.

- (3) Settling - From the aeration tank, the treated sewage mixed with the activated sludge passes through a port in the wall into the settling tank or clarifier. In the settling tank the heavy activated sludge mass settles to the bottom and the clear treated liquid flows over a vertical metal plate or weir into the discharge line.



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Adequate volume is usually provided in this tank to retain the sewage for a four hour period. The settled sludge or bacteria is then returned back to the aeration tank by the air lift sludge return system to decompose more incoming sewage. This system consists of a large diameter pipe extending from above the settling tank down to the hopper - shaped bottom of the tank. Air is injected into this pipe near the bottom. As the air rises in the pipe, sludge is drawn into the pipe and lifted to the top and into another horizontal pipe to the front of the aeration tank where it is mixed with more incoming sewage. An air lift type skimmer operated on the same principle is usually installed in the settling tank so that floating solids can be removed and discharged back into the aeration tank. (See Figure 2).

- (4) Chlorination - The treated liquid (the effluent) discharged from the settling tank then passes through chlorination facilities; this is done to kill the disease-carrying (pathogenic) bacteria which might be in the effluent. The treated effluent passes into the chlorine contact tank. There a chlorine solution is pumped by the chlorinator pump from a solution tank mounted in a weatherproof housing and discharged into the contact tank. The sewage is then allowed to mix with the chlorine, usually for thirty minutes, and pass out of the tank through the final plant discharge.
- (5) Sludge Holding facilities are sometimes required. This consists of modifications of the sludge return system to allow a portion of the activated sludge to be diverted to a sludge holding tank. These facilities are used when the amount of sludge in the plant becomes so great that it cannot be efficiently settled out and returned to the aeration tank.

WasteWater Treatment Systems

PURESTREAM PREFABRICATED STEEL
SEWAGE TREATMENT PLANT

GENERAL

There shall be furnished and installed one complete PURESTREAM factory-built extended aeration type sewage treatment plant with all needed equipment for the efficient operation of the plant, as manufactured by PURESTREAM, INC. The plant shall be a welded steel rectangular tank structure divided into two major sections, an aeration compartment and settling basin. The principal items of equipment in each unit shall include: air diffusers, effluent trough, return sludge air lift or air lifts, rotary blower(s) complete with necessary motors and controls, blower and motor housing, all necessary internal piping and accessory equipment as herein specified. The treatment plant structure shall be reinforced to withstand normal pressures from the soil and from the interior hydrostatic load.

OPERATING CONDITIONS

The plant shall be capable of treating 10,000 gallons per day of raw sanitary sewage or waste with a 5-day BOD not to exceed 240 ppm.

CONSTRUCTION

The treatment plant proper shall consist of an aeration tank and a final settling tank in one rectangular structure with all necessary baffles and partitions, factory installed. All side walls, bottom and partitions shall be of structural grade steel plate. All structural shapes used for reinforcing and bracing shall have minimum thickness of one fourth inch.

The blower assembly shall be enclosed with a FIBERGLASS housing hinged on one side with a locking device. The complete assembly shall be shipped unmounted and shall be bolted in place on the PURESTREAM plant by the purchaser. All necessary pipe, fittings and flexible connectors to connect the blower to the air header shall be furnished. A complete air diffusion system consisting of an air header and air diffuser drop-pipe assemblies shall be furnished.



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001

WasteWater Treatment Systems

AERATION COMPARTMENT

The aeration compartment shall have sufficient capacity to provide at least 24 hours detention of the full design flow. It shall be provided with baffles where necessary to insure rapid circular flow without dead spots where sewage solids can accumulate and become septic.

AIR PIPING

All air piping from the blower or blowers to the air header shall be schedule 40 steel pipe with malleable iron fittings. Flexible reinforced rubber connecting sleeves shall be provided where required. Air piping for the sludge return air lifts shall be schedule 40 steel pipe and fittings. An air control valve shall be furnished in each air lift air supply line.

AIR DIFFUSION DROP-PIPES AND DIFFUSERS

Each air diffusion device shall be connected to the air header with a 1 1/4" schedule 40 steel drop-pipe. The drop-pipe shall be connected to the air header in a manner to permit raising the drop-pipe and diffusion device above the water surface quickly and without disturbing air flow to the other diffusers. The air diffusion devices shall be designed to distribute air over the entire length of the aeration tank and to have an efficiency such that an adequate supply of oxygen is maintained in the aeration tank to treat the sewage load for which the plant is designed. The drop-pipes and diffuser assemblies shall be factory mounted on the air header.

FINAL SETTLING TANK

The final settling basin shall be formed by sloping the end wall of the plate structure and by inclining in the opposite direction the partition wall between the settling tank and the aeration compartment. The bottom of the tank shall be formed into an inverted pyramidal hopper or hoppers. All side walls shall have a slope of at least 60 degrees. Flat bottom area of each hopper shall be



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002

WasteWater Treatment Systems

the minimum practicable and in no case greater than one square foot.

After flowing through the final settling tank the clarified liquid shall pass over the edge of the effluent trough weir into the effluent trough and through the effluent pipe to the settling tank outlet. The sludge which settles to the bottom of the hopper or hoppers shall be returned continuously to the aeration tank by means of the air lift placed in each hopper.

SLUDGE RETURN AIR LIFT(S)

ONE air lift(♯) shall be installed in the final settling tank of the PURESTREAM sewage treatment plant. The riser and discharge pipe shall be schedule 40 steel. An air valve shall be furnished for each air lift.

AIR LIFT SKIMMER

A skimming device shall be installed in the settling basin downstream of the scum baffle to remove floating material and discharge it by means of an air lift to the aeration compartment of the PURESTREAM sewage treatment plant. It shall consist of a drop-pipe or skimming pipe mounted so that it can be raised or lowered with respect to the basin water surface by means of an adjusting screw with hand knob. The air lift shall be equipped with a 3/4" air line and an air control valve. A discharge pipe shall be installed from the skimmer air lift to the aeration compartment.

BLOWERS

TWO blower(s) shall be furnished, each to deliver 60 CFM of free air measured at the blower inlet at 5 PSI maximum. Blowers shall be SUTORBILT 3H rotary positive displacement type with V-belt connection to the motors. Blowers shall be equipped with filter-silencer on suction intake, and discharge piping shall include air relief valve and flexible coupling. Gas type check valves shall be installed if two blowers are specified above.



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003

WasteWater Treatment Systems

MOTORS

Each blower shall be driven by a 3 H.P., 1750 RPM, 1 phase, 60 cycle, 230 volt, horizontal ball bearing electric motor with T.E.F.C. enclosure. Motor shall be mounted on adjustable sliding rails. The motors shall have a 15% service factor but shall not be over-loaded beyond the nameplate rating at the design conditions specified above.

ELECTRICAL CONTROLS

For each blower-motor, thermal magnetic circuit breakers shall be provided, to serve both as disconnect switches and over-current protection against short circuits or grounds of the motor branch circuit conductors, control equipment and motors.

Magnetic across-the-line starters with overload protection shall be supplied to operate and protect the motors. For 3-phase motors, overload protection shall be provided in each phase to give positive protection against single phasing.

ELECTRICAL CONTROL ENCLOSURE AND WIRING

All electrical control equipment shall be mounted within a separate weather-proof enclosure, fabricated of FIBERGLASS and provided with a rigid door designed for locking. All switches shall be clearly identified and all internal wiring shall be factory installed. All wire and conduit required between the treatment plant electrical control enclosure and the electrical power service shall be furnished and installed by the purchaser. Wiring and conduit between the plant control panel, blowers and accessory items shall be factory installed for field hook-up by installing contractor when these items are to be installed in or on the Purestream tank(s). If any or all control panels, blowers or accessory items are mounted away from or off the Purestream tanks(s), it will be the installing contractors responsibility to provide and install any necessary conduit and wiring to hook-up these items.

WELDING

All steel structural members shall be joined by electric arc welding with fillets of adequate section for the joint involved. Where required for additional sectional strength, such welds shall be continuous inside and out.



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004