

## **Systematic Process For Treating Raw Domestic Wastewater**

### **Sequential Processes To Treat Wastewater to a Tertiary Standard Suitable for Reuse**

Wastewater discharged from the Dealership flows by gravity to the WWTP system which is located behind the facility. The first level of treatment is accomplished in a Primary Clarifier chamber (PC) whereby solids and non-digestible matter are settled from the raw sewage. Influent floatables (scum, fats, oil, or grease) and other harmful debris (string, plastic, grit, indigestible particulates) are screened from the downstream treatment processes which ensures maximum protection of the downstream processing equipment.

#### **Flow Equalization (FEQ)**

Water that was pretreated in the PC flows by gravity to the next stage of the treatment process. A Flow Equalization (FEQ) chamber is employed and provides temporary storage of wastewater that may come in large surges throughout the day. The stored wastewater is systematically dosed to the downstream MBR system for final biological treatment. An analog level sensor provides real time monitoring of FEQ water levels and auxiliary mechanical float switches provide redundant operational control.

#### **Membrane BioReactor (MBR)**

An MBR system provides advanced biological treatment of the flow equalized wastewater. The membrane filtration assembly provides enhanced liquid-solids separation while at the same time accomplishing advanced biological treatment of organics still contained in the pretreated wastewater. A continuous aeration process scours and clears the membrane which allows for sustainable effluent filtration. Analog level sensors provide real time liquid level monitoring and system control while auxiliary mechanical floats provide redundant back-up level control functionality.

#### **Permeate Pumping**

Permeate (or filtered water) liquid is pulled through the permeate piping system by suction pressure applied to the membranes module; a dedicated permeate pumping system provides precise flow control. Sophisticated flow metering is used to monitor the permeate flow and suction pressures. The membrane system is equipped with a backwash Clean-In-Place (CIP) system providing systematic backwash of the membrane filtration unit. The permeate pump and backwash pump systems are controlled by an intelligent programable logic control (PLC) based Control Program housed in a central Control Panel located in the WWTP Equipment Building.

## **Sludge Wasting and Effluent Purging**

The MBR unit enables periodic wasting of biosolids and accumulated biosolids that are pumped to a dedicated Sludge Holding chamber. Waste sludge is aerated to digest any organics and after digestion, is pumped and hauled away for final disposal. Pump and Haul is projected to happen approximately one time per year.

## **Disinfection**

The permeate water receives final treatment in the form of a redundant disinfection system. The first phase of disinfection is accomplished using an UltraViolet (UV) Light disinfection assembly and this disinfected water is then discharged by gravity to a tablet chlorination system. This form of redundant disinfection ensures that the treated waters are rendered sterile and the chlorination system allows for a chlorine residual to carry through to the effluent storage and recycling system.

## **Effluent Storage and Pumping**

Highly treated effluent is temporarily stored in a 10,000 gallon effluent storage chamber. This chamber is equipped with an auxiliary aeration system which assists with effluent mixing that contributes dissolved oxygen to the reclaimed water which further improves final effluent water quality. The master control panel automatically operates the effluent recycling system and pumping is monitored in such a way that reclaimed water can be effectively resupplied to the dealership for toilet and urinal reflush purposes.

## **Monitoring Station & Control Panel With Ancillary Equipment**

A PLC based control panel provides automatic operation of the wastewater treatment system. The panel is equipped with web-based internet alarming capability. The web-based access feature permits remote monitoring and operation functionality in real time and is connected to the local internet network.

Additional ancillary equipment external to the waste water treatment plant tankage is also installed in the properly engineered equipment enclosure.

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