

Subject : Preventive Maintenance Services of the Calamba Water District Septage Treatment Plant

Budget : ₱194,000.00 per month × 12 months = ₱2,328,000.00

Scope of Works

1. Assignment of at least one (1) dedicated technical engineer for operations and maintenance related to the Septage Treatment Plant and vacuum trucks only.
 - a. To visit the facility for at least two (2) days per month (8 work-hours per day) to monitor the operations and maintenance activities and perform monthly plant audit and process inspections.
 - b. Help supervise the activities of the facility related to desludging and treatment, and to provide training and guidance as needed by the staff.
 - c. Provide technical support when in the facility and in case not onsite, shall be available for 24/7 phone support.
 - d. Onsite testing of parameters for process adjustments, if needed.
 - e. Please refer to the Table of Plant Requirements (maintenance of plant and trucks).
2. Assignment of technical support team to perform monthly, quarterly, and annual preventive maintenance activities of vacuum trucks and electro-mechanical components.
 - a. Perform routine checking, testing, and inspection of equipment and process, as needed;
 - b. Perform replacement of equipment minor consumable parts (i.e. oils and greases, gear/motor bearings, valves, etc.);
 - c. Perform routine oil change and filters of vacuum trucks, including annual rustproofing/body repainting, as needed;
 - d. Perform third party calibration of flowmeters (up to 4 units maximum for electromagnetic units only)
3. Access to service provider's wealth of knowledge and network for best practices sharing on operations, maintenance, and improvement of septage treatment facilities.

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Table of Plant Requirements (maintenance of plant and trucks)

PLANT REQUIREMENTS		
Equipment	Frequency	Inspection / maintenance activities
Rock trap	Monthly	Exterior and interior checking, removal of solids inside
Macerator	Monthly	Checking for leaks, audio, and exterior cleanliness Checking the functions and flow rates Checking the oil level of machine gear unit and oil refilling, as needed
	Quarterly	Checking of machine and attachments for tight fit and possible damage, recommend items for replacement only (for separate billing to client of parts)
	Semi-annual	Checking quality of quench fluid and seals, to be replaced as needed
	Annual	Checking of electrical system and control unit functionality
Polymer transfer pump	Monthly	Checking of current and ammeter fluctuation, insulation resistance Visual inspection of equipment and parts, recommend items for replacement
	Annual	Mechanical seal oil replacement
Hyperboloid mixer	Monthly	Tightness of mixing shaft locknut and connecting bolts Swing of mixing shaft and removal of entanglements from impeller and mixing shaft Transmission parts sound and temperature
		Electrical conditions, insulation condition of motor before startup
	Semi-annual	Replacement of reducer-lubricating oil, as needed
Lime tank with mixer	Monthly	Insulation resistance of motor Refilling of grease, as needed Leak checks and visual inspection of tank exterior and interior Checking of brake gap G and torque
		Cleaning of tank from sediment build-up
		Semi-annual
		Checking/replacement of oil seal and v-ring, as needed
Flocculant tank with mixer	Monthly	Insulation resistance of motor Refilling of grease, as needed Leak checks and visual inspection of tank exterior and interior Cleaning of tank from sediment build-up
		Semi-annual
		Checking/replacement of oil seal and v-ring, as needed
		Change oil
Flocculant metering pump	Monthly	Check pump setting and conditions, diaphragm conditions
		Checking of bolts fixing, oil levels, any leaks and parts for replacement
	Semi-annual	Checking of ball valves, valve seats, and valve guide
Dewatering feed pump / Equalization transfer pumps	Monthly	Checking of current, ammeter fluctuations, current/power voltage monitoring and insulation resistance
	Annual	Replacement of oil in the mechanical seal chamber or mechanical seal
Dewatering unit	Monthly	Inspection of equipment, accessories, and controls Visual checking, exterior and interior washing/cleaning, as needed Oil checking and injection for hydraulic system Greasing of transmission system bearings, lubricant injection for gearbox

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Flowmeter	Monthly	Checking of digital displays and actual volume in holding tank
	Annual	Third party calibration
Anoxic tank mixer	Monthly	Tightness of mixing shaft locknut and connecting bolts
		Swing of mixing shaft and removal of entanglements from impeller and mixing shaft
		Transmission parts sound and temperature
		Electrical conditions, insulation condition of motor before startup
	Semi-annual	Replacement of reducer-lubricating oil
Equalization/Digester Blowers	Monthly	Current and ammeter fluctuations, motor insulation resistance
		Sound and visual check during operations
		Checking of tension of the V-belts
		Application of grease on gear bearings, as needed
		Bearing oil seal, gears, replacement of gear oil as needed
		Cleaning of blower casings
Equalization coarse diffusers / SBR Fine Bubble Diffusers	Monthly	Pressure checking, energy consumption
		Blockage checking and cleaning, as needed
		Trend review of DO levels, blower pressure and energy consumption
		Recommendations for replacement, as needed
Decanter pump	Monthly	Checking of current, ammeter fluctuations, current/power voltage monitoring and insulation resistance
	Annual	Replacement of oil in the mechanical seal chamber or mechanical seal
WAS Transfer Pump	Monthly	Checking oil levels of the speed variator
		Mounting of bolts for looseness
	Quarterly	Inspection of shaft seal, oil seal, packing glands, and mechanical seals
	Semi-annual	Inspection of rotor and stator for scratches, wear, and corrosion on surfaces
Disinfection/Chlorination system	Monthly	Pump settings and conditions, ORP reading
		chlorine residual checking
		Tank levels
		Diaphragm checking and replacement, as needed
		Checking of valves, valve guides, gasket, and O-ring, replacement as needed
		Checking of discharge tubes/pipes, etc.
	Annual	Replacement of suction and discharge tube (billable parts to client)
Clarifier System	Monthly	Visual check of operating conditions of clarifier and lamella
		Blowdown procedure for sludge accumulation, as needed
Potable and non-potable transfer pump	Monthly	Checking of rotary direction, pump conditions and settings
		Checking for leakage, operating pressures, motor overheating
Potable and non-potable water tank	Monthly	Electrical conditions
		Checking and recording of tank levels
	Monthly	Visual inspection for leakage and surface of tanks
Filtration feed pumps	Monthly	Checking of current, ammeter fluctuations, current/power voltage monitoring and insulation resistance
	Annual	Replacement of oil in the mechanical seal chamber or mechanical seal
Sand filter & Activated Carbon Filter	Monthly	Visual inspection and cleaning
		Backwashing, as needed
	Annual	Checking and assessment for media replacement
Generator set	Monthly	Checking of engine and fluid levels - lubricant, coolant, fuel/oil supply
		Checking radiator cleanliness, air filter restriction, engine fan belts (wear/tightness)
		Air inlet and outlet openings, winding/resistance levels
Control panels	Monthly	Overall functionality, wire connections, and meter calibrations
VACUUM TRUCK MAINTENANCE REQUIREMENTS		
Vacuum truck cab, chassis, and vacuum pump	Monthly	Checking of pump conditions
		Checking of tire and hose conditions, recommend for replacement
		Checking of truck battery, brake pads, spark plugs, recommend for replacement
	Quarterly	Replacement of oil/fuel filter, air filter
	Annual	Tank body rustproofing/reapplication as needed

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