Pan America Environmental, Inc.

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ENGINEERING SPECIFICATION

VEW Series Vehicle/Equipment Wash Water Treatment System

Engineering Specification

MODEL RANGE	GET A QUOTE	SPEAK TO AN ENGINEER
VEW-2 through VEW-80	technical@panamenv.com	262.716.0105

PRODUCT PAGE

https://www.panamenv.com/vehicle-wash-water-treatment/vew/

SECTION 1.0 EQUIPMENT DESIGN & CONSTRUCTION

Single Pass & Recycling Operation

The VEW systems can be used as a single pass and discharge system or as a recycle system depending on the project needs. The VEWs are designed to remove oils, fuels, suspended solids and other contaminants as detailed in this specification. Where rigorous removal of dissolved minerals and metals are required, additional treatment may be needed as this system does not remove dissolved materials.

Emulsion removal: the VEWs are not designed to remove emulsions mechanically.

Implementation

PAE recommends use of a washpad, collection trough and a collection sump prior to the VEW system in order to drop out heavy solids loads and large particulates. This design will reduce the solids load to the VEW leading to less maintenance and less possibility of overloading the oil and solids removal systems within the VEW system. If using the EnBio system PAE also recommends a minimum of 60 minutes retention time at maximum flow rate in order to provide a proper time frame for the EnBio bacteria to operate within.

The retention time would consist of all the retained water volume in the treatment equipment and could include: oil water separator, collection sump/pit, ZeoMaxx filter and any other treatment tanks that may be in the treatment loop.

Performance

The Pan America Environmental VEW Series washwater treatment systems are designed to produce an effluent concentration of 10 mg/l or less of oil droplets 30 micron and larger of non-emulsified, free and dispersed oils at the influent. By virtue of our Flopak coalescing media and tank design readily settleable solids are also removed. All filterable solids are removed down to 20-micron particle sizing (nominal). Removal of free and trace hydrocarbons, dispersed oils, sheens (VEW-A only), slightly soluble chlorinated hydrocarbons and high molecular weight organics is also provided.

1.01 System Components

The VEW system shall consist of the following components:

- OSe Series Oil/Water Separator

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- Retpak Secondary Coalescer
- Effluent Transfer Pump
- NEMA 4 Control Panel
- Effluent Solids Filter
- ZeoMaxx Polishing Filter
- Flow Meter

1.02 Oil/Water Separator

The OSe series higher performance high oil volume oil/water separator will be designed and fabricated per the following:

- Rectangular tankage with features and components as described designed per API #421 Design & Operation of Oil/Water Separators Manual, February 1990 and stokes law.
- Influent chamber with clog proof influent diffuser
- V-hopper solids collection hopper
- Adjustable oil skimmer, PVC construction
- Expanded effluent chamber with large water volume for effluent pumpout supply
- Separation chamber contains Flopak cross-corrugated coalescing media, PVC construction, 1/2" plate spacing
- Cover is a single or multi-section, vapor retaining design with polyethylene gasket and zinc plated attaching hardware and provides complete closure of the tank
- Vent: The oil outlet can be used as tank vent by plumbing in a PVC tee. If separate vent fitting is required PAE can provide an individual coupling located wherever desired.
- All wetted fittings will be FNPT to 3" and 150# B16.5 FF flange 4" and greater.

SECTION 2.0 MATERIALS OF CONSTRUCTION

2.01 OWS Tank Construction

Tank shell, baffles, fittings and cover shall be 304 SS construction with exterior passivation surface preparation.

2.02 Piping

Internal piping to be 304 SS.

Oil skimmer to be PVC.

External piping for component interconnection shall be type 1, grade 1-PVC, schedule 40 & 80.

2.03 Coalescing Media

Cross-fluted, oleophilic, PVC Flopak coalescing media shall be provided as manufactured by Pan America Environmental.

2.04 Cover Gasketing

Closed cell, industrial grade polyethylene constructed vapor sealed cover gasketing shall be provided. No neoprene shall be permitted.

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SECTION 3.0 SYSTEM COMPONENTS

3.01 Retpak Secondary Coalescing Media

A Retpak, reticulated, polyurethane secondary coalescing media shall be included to provide increased coalescing surface area in the oil/water separator to remove smaller oil and fuel droplets.

3.02 Effluent Pump and Control Panel

The treated wastestream is pumped out of the oil/water separator via an automatic/manual pumpout system.

- Pump: Centrifugal, 304 SS volute and impeller design with TEFC motor.
- Control via NEMA 4 or 4X control panel with HOA operation. When in the automatic mode the pump on/off function is to be controlled by a dual, level switch assembly located in the oil/water separator effluent chamber. Power disconnect optional. Voltages provided: 115V/1pH/60/50 Hz., 230/460V/3pH/60/50 Hz. As project requires.
- Flowmeter will be provided in pump discharge to accurately indicate system flow rate.
- Pump system will be mounted, plumbed and wired to the VEW system and plumbed via ASTM, D-1784, schedule 80 PVC.

3.03 Effluent Solids Filter

A filter housing assembly shall be provided mounted to the pump discharge piping to facilitate removal of all the filterable solids.

- Filter housing, housing cap, internal bag basket and replaceable filter bags are to be of polypropylene construction. Cap housing seal is Buna-N. A pressure gauge is provided to indicate bag changeout pressures.
- Filter housing, housing cap, internal bag basket and replaceable filter bags are to be of aluminum or coated steel construction, bag basket is 304 SS construction. Cover seal is Buna-N. A pressure gauge is provided to indicate bag changeout pressures.
- Four (4) filter bags are provided with the system. Additional bags are available in case quantities.

3.04 ZeoMaxx Polishing Filter

- A ZeoMaxx polishing filter is provided for the selective adsorption of free, dispersed oils, sheens, slightly soluble chlorinated hydrocarbons and high molecular weight organics. The ZeoMaxx media is designed for removal of metals as well as oils and fuels.
- Filter housing is fiberglass construction per NSF, UL approved WQA standard S100 with an FRP housing base that allows removal and refill of exhausted media.
- Filter tank is provided with internal distributors that distribute and collect the flow evenly throughout the media bed to avoid channeling and incomplete exposure of the ZeoMaxx media to the waste flow.
- Plumbing is provided from effluent pump and will be schedule 80 PVC.
- Pressure gauge, check valve, drain valve are provided.
- Backwash valving is provided.
- The ZeoMaxx filter system with Z200 organoclay and/or ZAC media can increase oil removal efficiency down to 5 mg/L or less.

Uses

- Pan America Environmental ZeoMaxx

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- ZeoMaxx organoclay filter media
- ZeoMaxx PFAS filtration tanks
- Pan America ZeoMaxx polishing filter
- ZeoMaxx after DAF or oil separator
- ZeoMaxx for vehicle wash recycling

3.05 Manufacturer

The manufacturer of preference shall be:	Pan America Environmental, Inc.

3.06 Warranty

Pan America Environmental warrants its products to be free of defect in materials and workmanship for a period of one year from the date of shipment.

3.07 Installation Operation Manuals (IOMs)

Two (2) IOMs are provided with each system.

3.08 Field Services

Site visit/field services can be provided as desired. Cost is $1250.00 per Diem + expenses. Please contact PAE for current site visit.

Applications

- fleet vehicle wash water treatment
- heavy equipment wash water system
- car dealership wash bay treatment
- trucking company wash water recycling
- construction equipment wash water treatment
- municipal fleet wash wastewater system
- industrial wash bay water treatment

SECTION 4.0 OPTIONS

4.01 Influent Feed System

Description: The Influent Feed System will provide the capability of transferring the wastestream from a below grade sump to the inlet of the VEW Series separator. The system can be operated via manual or automatic mode.

Components:

- 1/2" air operated, double diaphragm pump with aluminum body/Buna-N diaphragms and check valves. Pump will be plumbed with ball valve on inlet and outlet. Pump to be base mounted to a carbon steel, enamel coated base.
- Filter, regulator, metering valve and electric solenoid valve will be provided mounted to the pump base for filtering, regulation, fine meter control and on/off of air flow to pump. The assembly will include an air hose from assembly discharge to pump air inlet.

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- NEMA 4 controls: Controls will be included with HOA operation to control manual and automatic on/off of pump based on high/low levels in customer's sump. Two float switches will be provided for installation in the sump (by others). Controls are integrated into the VEW MCP.

4.02 Pressurized Supply Module (PSM)

The Pressurized Supply Module (PSM) is provided to collect the clean water from the VEW effluent and transfer it under pressure to a point of reuse, further treatment or discharge.

The system is designed to be located after the VEW system and plumbed into the VEW discharge (by others). The PSM pump automatically starts and stops based on demand from a pressure washer and if the water in the clean tank drops too low in the tank a low-level control system stops the pump from operating until the water level rises.

The system consists of:

- Clean water tank w/clean water fill fitting. Volumes offered: 300, 500, 750, 1000 gallon
- Low level pump shutdown controls
- Pressure pump w/pressure switch
- Coated carbon steel skid
- Hydropneumatic tank
- Pressure pump suction plumbing

Uses

- PSM pressurization system for vehicle wash water
- Pressurization system for wash water treatment
- Industrial wastewater pressurization system
- PSM addition to dissolved air flotation
- Recycle saturation system for DAF
- Vehicle wash water recycling pressurization
- Pan America PSM vehicle wash
- Pressurized saturation tank wastewater
- Wash bay water treatment pressurization
- Retrofit pressurization system wastewater

4.03 SuperAerator XL3 System

The SuperAerator system combines metering of EnBio bacteria/enzyme blend with a diffusing aeration system that will provide the following benefit:

- Trace/emulsified oil/fuels, BTEX, kerosene reduction by breakdown of petroleum products
- Extends ZEOMAXX filter life by reducing oil load
- Reduce or eliminate odors associated with oils & fuels
- May also reduce your BOD concentration
- Reduces some soaps, PAE recommends biodegradable soaps for best results.
- See EnBio brochure for more detail on this product

Dosing

EnBio is added at 20 ounces per 1500 gallons for the two-three weeks and then is reduced.

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As EnBio is added the bacteria attach to and grow on the surfaces of the treatment equipment where the bacteria will establish, grow and maintain a self-reproducing colony, which reduces the amount of EnBio required to be regularly injected.

The system will continuously aerate the water volume via the use of an integrated aeration compressor system. As bacteria grow and reproduce they consume oxygen dissolved in the water. If your existing oxygen content is insufficient or can fluctuate and kill bacteria you need to aerate to maintain a health colony.

Equipment:

- Chemical metering injection pump mounted to VEW skid, wired to system control panel and plumbed into VEW plumbing
- Pump controls are located in the pump head.
- (2) 5-gallon containers of initial EnBio supply

In automatic mode the pump will operate based on the on/off of adjustable timers.

To provide oxygenation in systems depleted of oxygen or lacking sufficient aeration equipment the SuperAeration system provides the following features to create an aerated water supply to better supply EnBio bacterial oxygen demands.

- Aeration pump, 120V power required
- Aerating diffuser (for location in sump, tank or other location)
- Tubing and fittings to connect pump to diffuser

Uses

- Aeration for vehicle wash water
- Superaerator with EnBio biomedia
- Aeration and bacteria injection system
- Odor control aeration system
- Sludge reduction aeration
- Wash pit aeration system
- Sump basin aeration
- Biological treatment aeration
- EnBio metering pump and aeration
- Vehicle wash water odor control
- Reduce pit sludge and odor
- Aeration for car wash recycling
- Heavy equipment wash water aeration
- Odor elimination in wash pits
- Odor elimination in oil water separators
- Remove oils from pits, pipes, sewers and septic tanks & fields

4.04 Spare Media

The following are provided for resupply of consumables in your VEW system:

- ZEOMAXX media, full replacement
- Filter bags, case of 25 or case of 50, polyester construction, 20-micron
- EnBio bacterial liquid, 5-gallon pail. 55-gallon drums also available

- Detergent: EBD-5, 5-gallon pail, 55-gallon drums & larger totes available.

SECTION 5.0 SUBMITTAL PACKAGE

5.01 Submittal Approval Package

Upon receiving an order Pan America Environmental will engineer and produce a Submittal Approval Package, which allows you the customer to review and change or keep aspects of the system detailed in this quote. The submittal package provides the following at a minimum:

- General arrangement drawings, 2D, 3D, plan, end, sectional, detail and other views
- Hydraulic profile
- Electrical schematics
- Control panel physical layout
- Process/control narrative (where project size is applicable)
- Component datasheets
- Component cutsheets

Options

- P&ID
- Structural, seismic, wind load, lifting lug review, anchorage and/or other PE review calculations
- Design sizing PE calculations and/or calculations of any other types
- Testing review and implementation during fabrication and assembly, i.e. NDT, NDE, radiographic, x-ray, ultrasonic, magnetic particle exam, others
- Piping testing per desired standards, i.e. ASME B31.1 power piping, ASME B31.3 process piping
- Rigging and lifting guide, drawings and/or procedures and methods
- WPS, ITP, PQR, PMI, others
- Document, QC report and/or other project document binder
- Mill certificates

Revisions & Meetings

The submittal package contains a limited amount of engineering and provides a maximum of Two (2) revisions of up to 10% maximum each. This quote does not include open ended, extensive or continuous revisions until approval is given. This submittal package does not include: Iterative R&D and review projects, design/redesign projects, pre-submittal before or after order placement to attain approval from the end user before order is placed, honored or executed by Buyer, engineers/consultants, contractors and/or other parties involved with this project. In addition, numerous and/or excessive meetings relative to the system design and complexity are not provided as PAE strives to have all valuable communications in writing so as to create a trackable/traceable project evolution.

Engineering Only

The quotation provides a limited amount of engineering and does not provide “Engineering Only”. The limited engineering is part of the system cost and is provided to give direction and final understanding as to what is being provided to you in the system design. The quoted and submitted system is a proprietary PAE product and PAE will not produce drawings for you to build, license, bid out or produce and/or market as your product for your or any other entities use.

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SECTION 6.0 FREIGHT AND SHIPPING PREPARATION

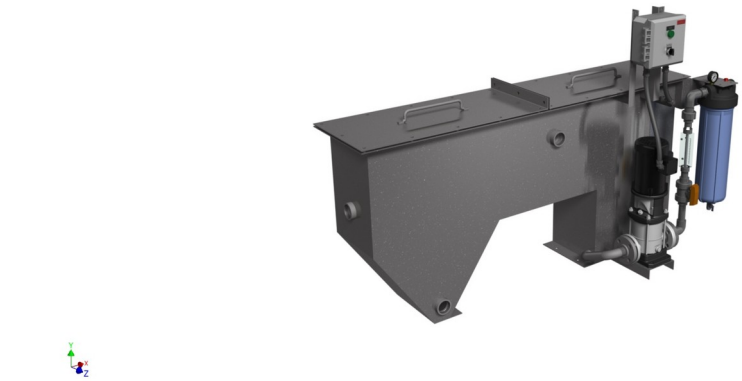
6.01 Freight Cost

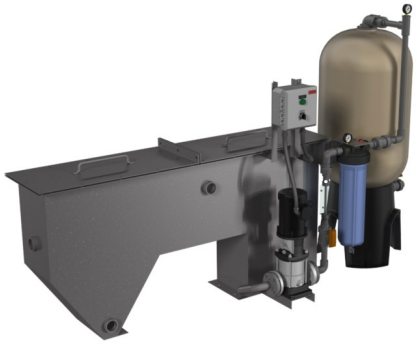
The quoted freight cost is an actual or estimated cost. This cost is subject to change throughout the life of the quote and any resultant order.

6.02 Palletizing

All equipment prices include palletization.

Design Examples: VEW-2

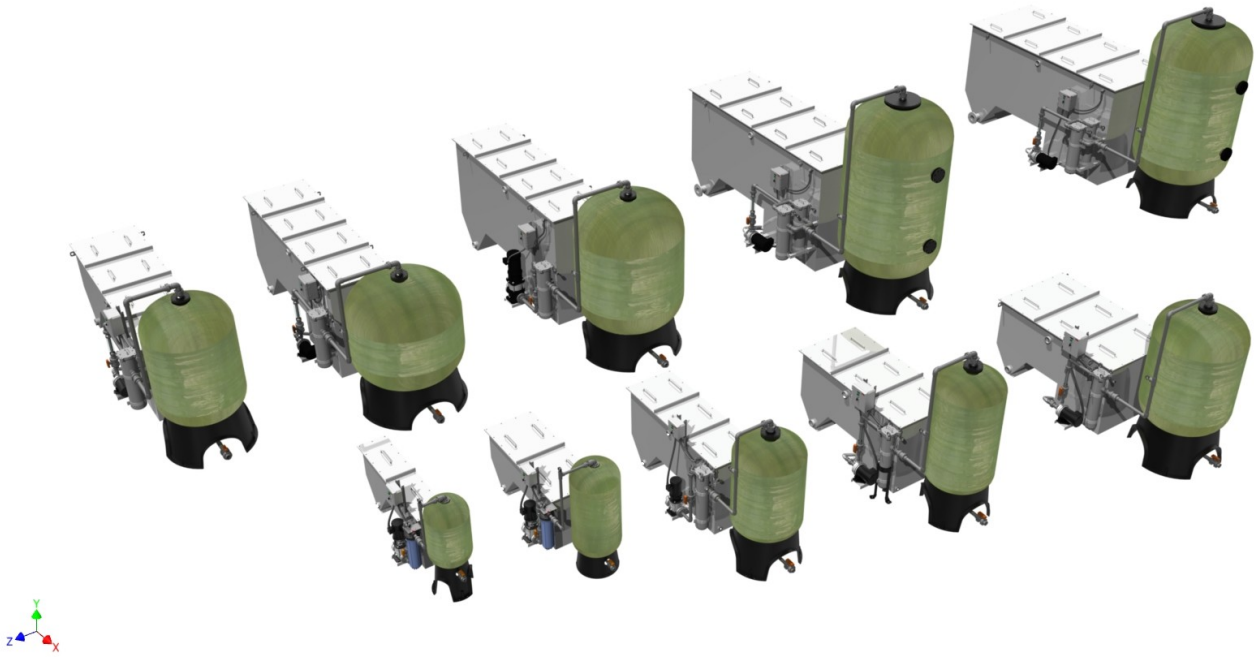




VEW-2-Z

VEW-A Family of Sizes

VEW2A to VEW80A



Specifying a VEW Series Vehicle/Equipment Wash Water Treatment System for your project?

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