



Model  
VEW

# VEW

Vehicle Equipment Washwater  
Treatment Systems 1 - 50 GPM

**The VEW Series treatment systems are designed to treat washwater generated by vehicle and equipment wash facilities where water needs treatment prior to discharge to sewer.**

The VEW systems are designed for treatment of water generated by vehicle and equipment wash racks or facilities. System configuration can be customized depending on the project needs. The VEW systems are designed to remove oils, fuels, suspended solids, organics and other contaminants. Where removal of high loadings of suspended solids, dissolved minerals and metals are required additional treatment or washpad design may be needed.

Any of our treatment products can be combined to design the needed configuration for any flow rate and contaminant type(s).

Options can be provided to complete the system design, such as, GAC filtration, bag or sand filtration, chemical treatment, pH adjustment, metals precipitation/filtration and any of the technologies in our product lineup.

Customization & modifications to fit your project needs are offered. Typical performance is 10 ppm and 5 ppm or less, 30 micron oil droplet.

### Features:

- ◆ OS oil water separator
- ◆ Effluent pumpout
- ◆ Effluent solids filter
- ◆ AQAM organoclay filter
- ◆ Flow meter
- ◆ Sealed/gasketed cover
- ◆ Coated steel system skid
- ◆ Nema 4 pump controls
- ◆ Schedule 80 PVC piping
- ◆ High performance
- ◆ Compact, simple design

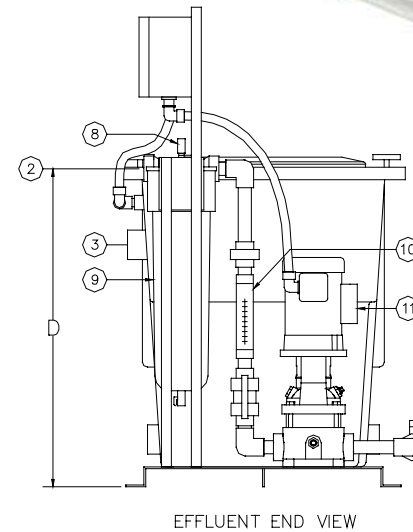
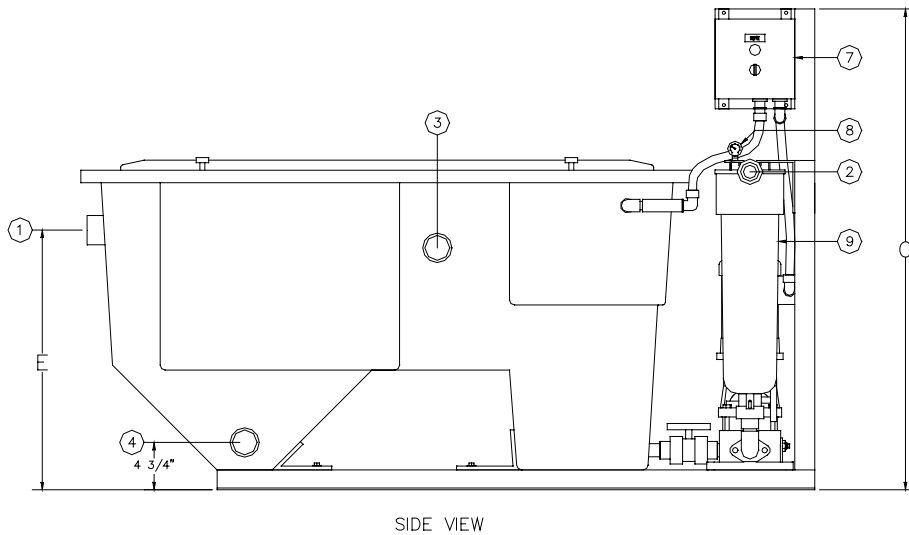
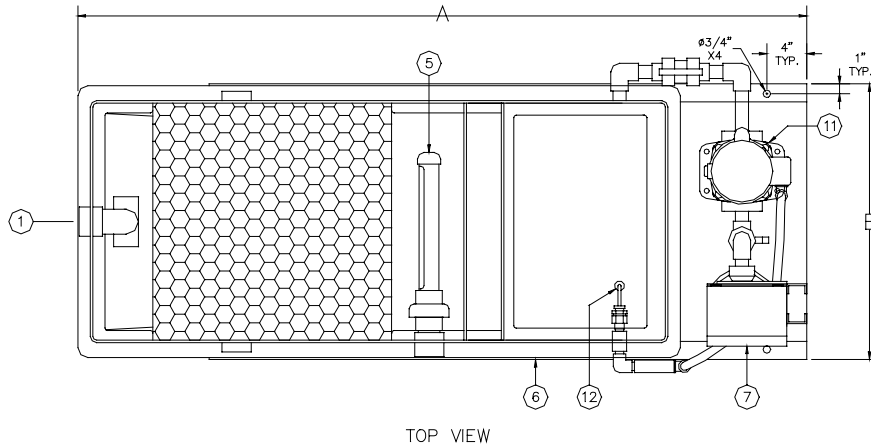
### Typical applications:

- ◆ Car/truck wash facilities
- ◆ Forklift wash pads
- ◆ DAF/Clarifier pre/posttreatment
- ◆ Power plant water treatment
- ◆ Refinery process water
- ◆ Aircraft wash racks
- ◆ Military wash racks
- ◆ Tank farm leakage treatment
- ◆ Vehicle washwater treatment
- ◆ R.O. Filter pre-treatment
- ◆ Oil spill recovery
- ◆ Trench water treatment
- ◆ Bilge water treatment
- ◆ Hydraulic fluid tank de-watering



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Vehicle Equipment  
Washwater Treatment

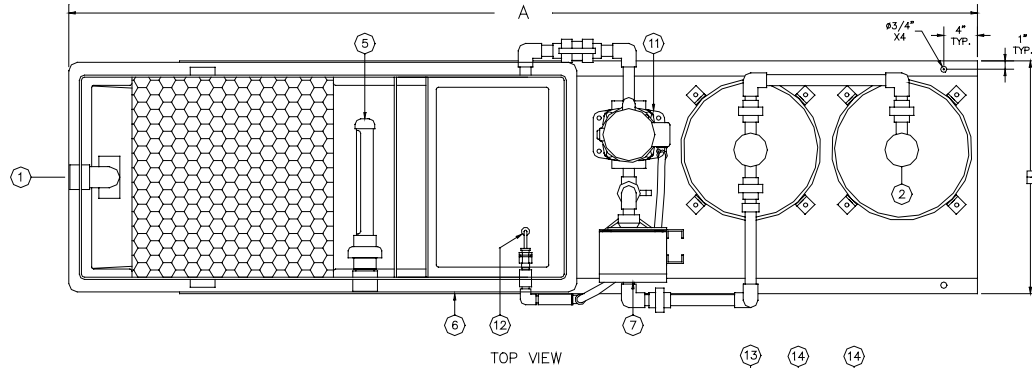


Models	Dimensions					Fitting Sizes			Weights (lbs)		Flow	
	A	B	C	D	E	Inlet	Outlet	Oil	Sludge Empty	Oper.	Sludge	GPM
VEW2	6'-1"	2'-4"	4'-0"	2'-8"	2'-2"	2"	1 1/2"	2"	2"	310	703	7 gal. 0-5
VEW4	6'-1"	2'-4"	4'-0"	2'-8"	2'-2"	2"	1 1/2"	2"	2"	335	1200	16 0-10
VEW8	6'-10"	2'-4"	4'-0"	2'-8"	3'-2"	2"	1 1/2"	2"	2"	405	2045	16 0-20

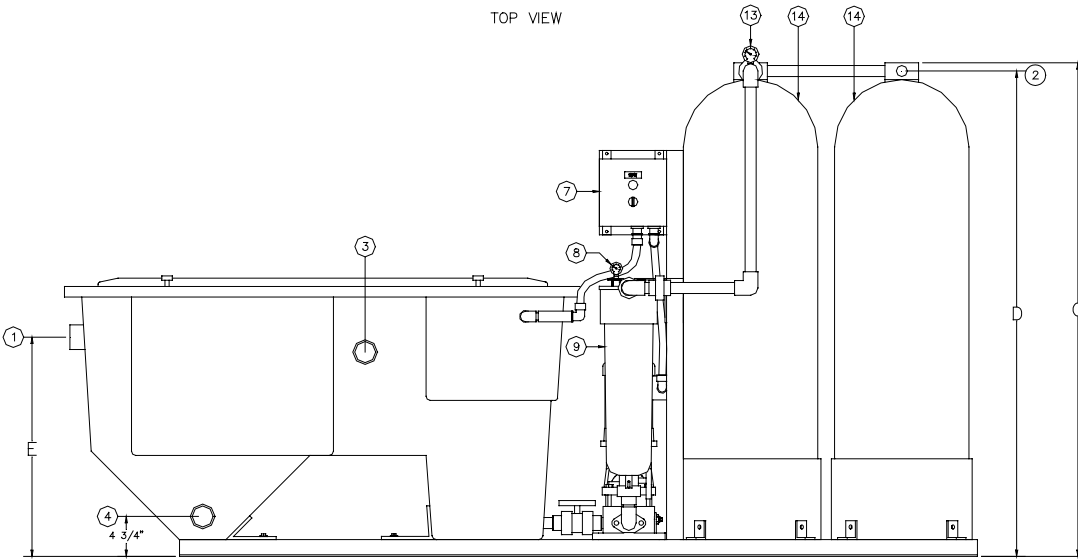
Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description
1	1	Inlet	4	2	Sludge Outlet	7	1	Control Panel	10	1	Flowmeter	13	1	Skid
2	1	Outlet	5	1	Oil Skimmer	8	1	Pressure Gauge	11	1	Effluent Pump	14		
3	1	Oil Outlet	6	1	Separator	9	1	Bag Filter	12	1	Level Switch	15		

Not for construction: Design and Dimensions subject to change without notice

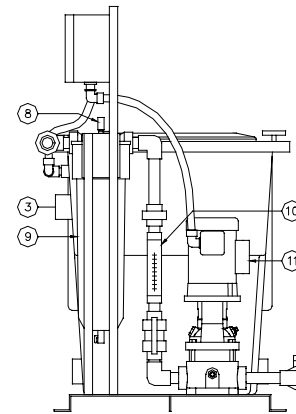




TOP VIEW



SIDE VIEW



EFFLUENT END VIEW  
AQAM FILTERS REMOVED  
FOR CLARITY

Model  
VEW-A

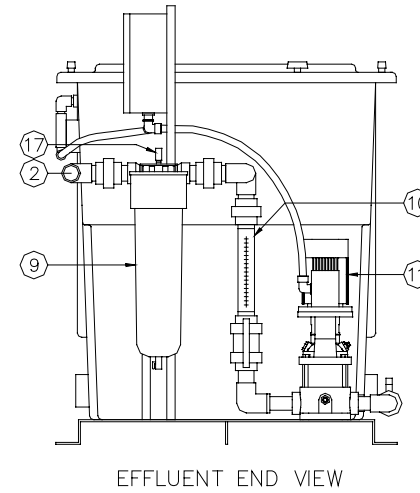
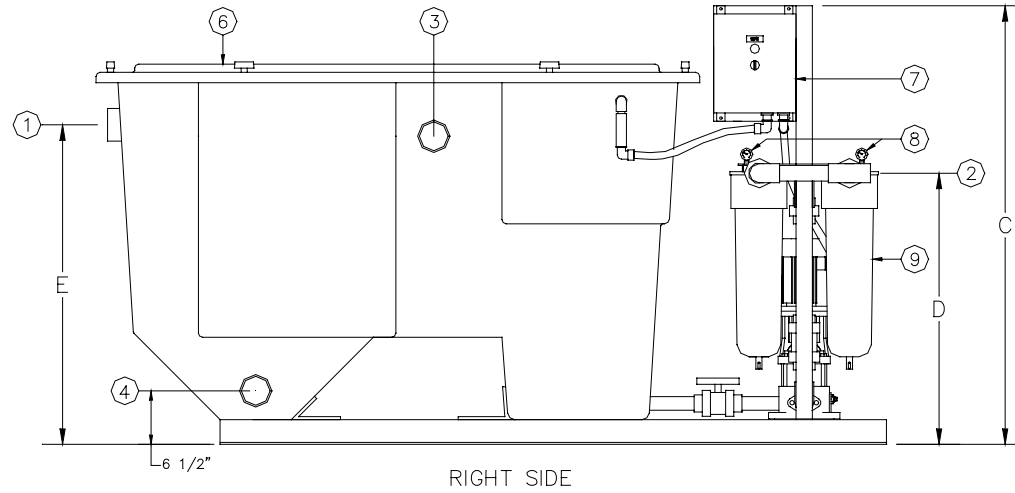
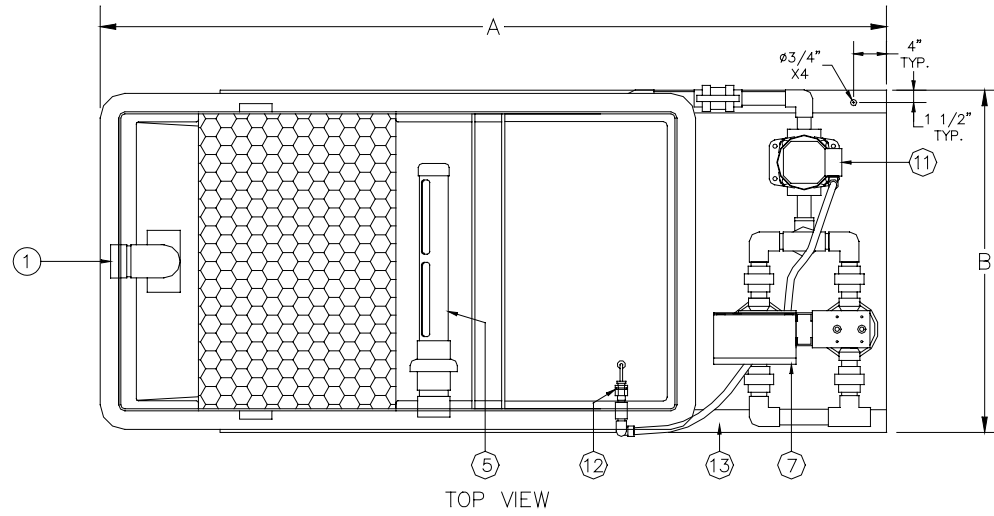
**VEW**  
Vehicle Equipment  
Washwater Treatment



Models	Dimensions					Fitting Sizes				Weights (lbs)		Flow	
	A	B	C	D	E	Inlet	Outlet	Oil	Sludge Empty	Oper.	Sludge	GPM	
VEW2A	9'-0"	2'-4"	4'-0"	3'-1"	2'-2"	2"	1"	2"	2"	622	805	7	0-5
VEW4A	9'-0"	2'-4"	4'-10"	4'-9"	2'-2"	2"	1"	2"	2"	812	2000	16	0-10
VEW8A	9'-6"	3'-0"	6'-10"	6"	3'-2"	2"	1-1/4"	2"	2"	1750	4020	16	0-20

Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description
1	1	Inlet	4	2	Sludge Outlet	7	1	Control Panel	10	1	Flowmeter
2	1	Outlet	5	1	Oil Skimmer	8	1	Pressure Gauge	11	1	Effluent Pump
3	1	Oil Outlet	6	1	Separator	9	1	Bag Filter	12	1	Level Switch
									13	1	Pressure Gauge
									14	1-2	AQAM Filter

The VEW8A is provided with a single AQAM filter vessel.  
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Model  
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# VEW

Vehicle Equipment  
Washwater Treatment

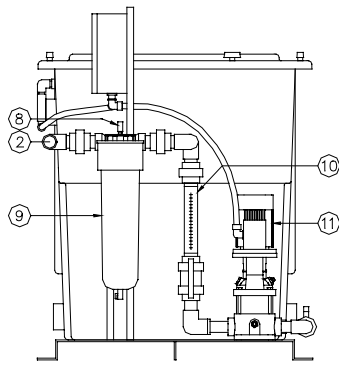
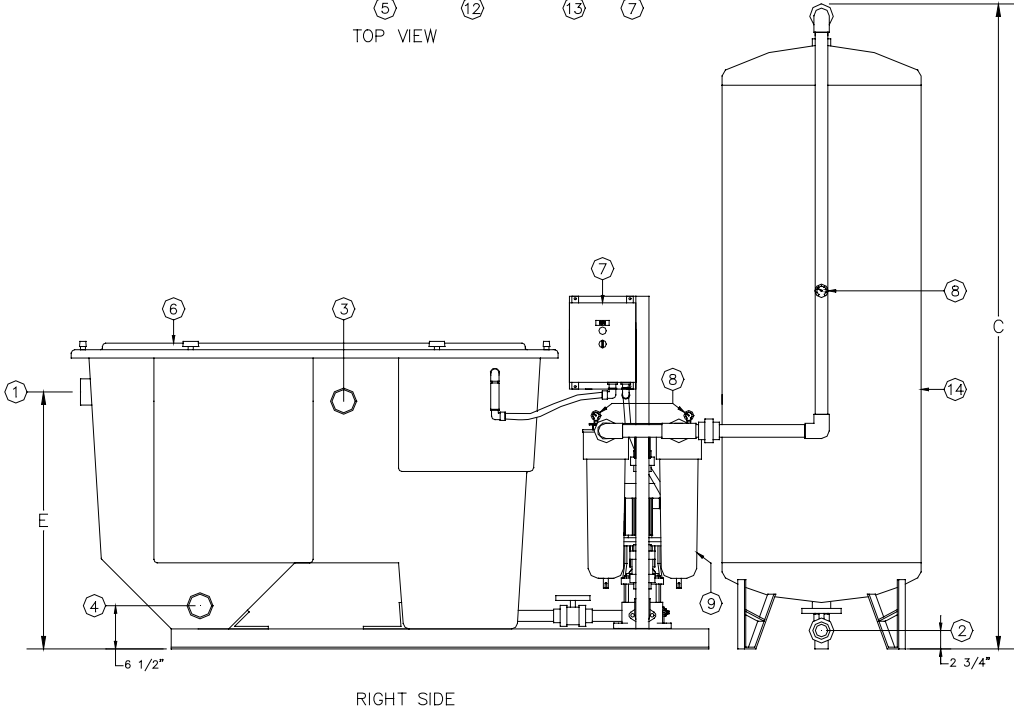
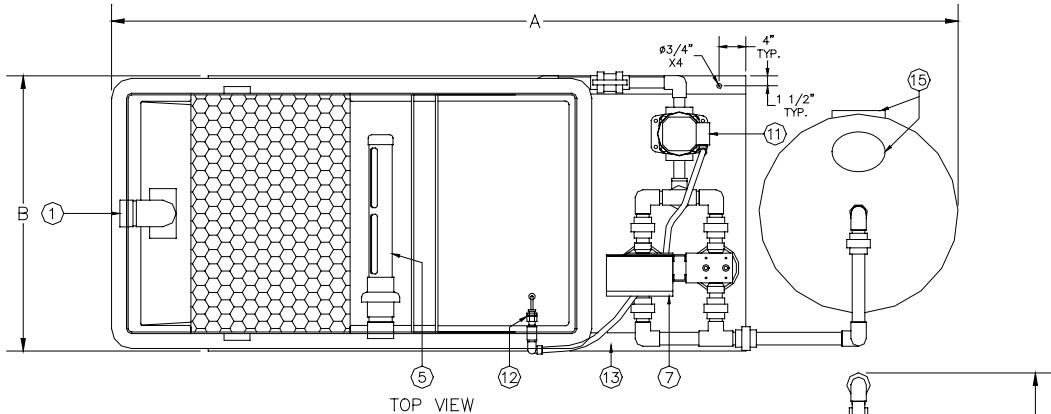
Models	Dimensions					Fitting Sizes			Weights (lbs)			Flow	
	A	B	C	D	E	Inlet	Outlet	Oil	Sludge Empty	Oper.	Sludge	GPM	
VEW12	8'-0"	3'-5"	4'-5"	2'-9"	3'-3"	3"	1-1/2"	3"	3"	751	3216	25	0-35
VEW16	8'-0"	4'-5"	4'-5"	2'-9"	3'-3"	3"	1-1/2"	3"	3"	900	5200	37	0-50

Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description
1	1	Inlet	4	2	Sludge Outlet	7	1	Control Panel	10	1	Flowmeter	13	1	Skid
2	1	Outlet	5	1	Oil Skimmer	8	1	Pressure Gauge	11	1	Effluent Pump	14		
3	1	Oil Outlet	6	1	Separator	9	1	Bag Filter	12	1	Level Switch	15		

Not for construction: Design and Dimensions subject to change

Model  
VEW-A

**VEW**  
Vehicle Equipment  
Washwater Treatment



EFFLUENT END VIEW  
AQAM FILTER REMOVED  
FOR CLARITY

Models	Dimensions					Fitting Sizes				Weights (lbs)		Flow	
	A	B	C	D	E	Inlet	Outlet	Oil	Sludge	Empty	Oper.	Sludge	GPM
VEW12A	11'-2"	3'-5"	7'-4"	3"	2'-2"	3"	1-1/2"	3"	3"	2506	5630	25	0-35
VEW16A	11'-2"	4'-5"	8'-4"	3"	2'-2"	3"	2"	3"	3"	3200	7500	37	0-50

Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description
1	1	Inlet	4	2	Sludge Outlet	7	1	Control Panel	10	1	Flowmeter	13	1	Pressure Gauge
2	1	Outlet	5	1	Oil Skimmer	8	1	Pressure Gauge	11	1	Effluent Pump	14	1-2	AQAM Filter
3	1	Oil Outlet	6	1	Separator	9	1	Bag Filter	12	1	Level Switch	15	2	AQAM Access

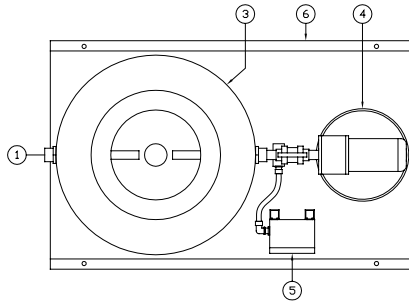
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# Pressurized Supply Module (PSM)

Model  
VEW

**VEW**  
Vehicle Equipment  
Washwater Treatment

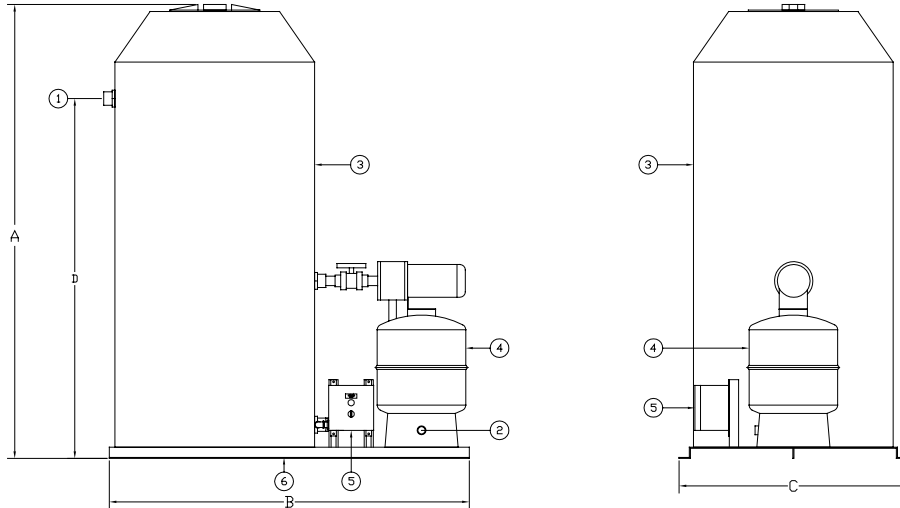


The Pressurized Supply Module (PSM) is provided to collect the clean water from the VEW effluent and transfer it under pressure to a point of reuse, further treatment or discharge.

The system is designed to be located after the VEW system and plumbed into the VEW discharge. 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 is provided mounted on a forkliftable, coated steel skid and consists of:

- Clean water tank w/clean water fill fitting
- Pump system
- Hydropneumatic tank
- Pressure switch
- Low level pump shutdown controls
- Coated carbon steel skid
- Pump suction plumbing



Model	Dimensions			Tank Gallons	Pump GPM	Pump PSI	Voltage VAC	Weight
	A	B	C					
PSM-150	4'-9"	4'-11"	3'-0"	150	5-10	30-50	115V	225 lbs.
PSM-300	6'-9"	5'-4"	3'-5"	300	10-25	30-50	115V	280
PSM-500	6'-3"	6'-4"	4'-5"	500	25-50	30-50	115V	325

Item	QTY	Description	Item	QTY	Description
1	1	Inlet	4	1	Pump
2	1	Outlet	5	1	Control Panel
3	1	Clean Tank	6	1	Skid

## VEW System Specification

Models: VEW2 – VEW8 / VEW2A – VEW8A

### 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 with all recycle systems the materials that are separated must be removed from the system and disposed of according to local and state guidelines (consult the local POTW authority or state EPA guidelines). Water loss will be experienced due to evaporation and overspray in the wash area due to atomization. Water replacement will be required in your storage tank to accommodate water losses. Ultimately, the entire water volume in the recycle system will have to be disposed of and completely replaced as the water cannot be reused indefinitely. As the initial water volume is used dissolved materials may accumulate such as: metals, minerals, soaps and other miscible contaminants.

Biological growth may be experienced over time and depending on your local environment & temperatures may produce odors. Occasional addition of an oxidant such as chlorine or sodium hypochlorite (bleach) usually reduces and controls this.

PAE recommends the use of quick break detergents to limit or stop the passage of chemically induced, stable oil-in-water emulsions requiring more treatment than that provided by the VEW systems to be removed. Being that most soaps and detergents are largely absorbed by the water the VEW may remove only a small fraction of the soaps. To some degree quick break soaps may combine with the oils they remove and may exit the system when you dispose of the separated oils and fuels. PAE recommends the use of our GAC carbon filter for removal of dissolved VOCs, light pesticide loads, solvents and other organics in projects where your clientele or business might expect to find these materials.

*Emulsion removal:* where emulsions may be an issue the AQAM filter can be sized to reduce or remove them.

### 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.

### Performance

The Pan America Environmental VEW Series wastewater 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 25- micron particle sizing (nominal). Removal of free and trace hydrocarbons, dispersed oils, sheens, slightly soluble chlorinated hydrocarbons and high molecular weight organics is also provided.

When the VEW-A version is used the performance produces an effluent concentration of 5 mg/l or less of oil droplets 30 micron and larger of non-emulsified, free and dispersed oils at the influent.

#### 1.01 System Components

The VEW system shall consist of the following components:

OS Series Oil/Water Separator, Retpak Secondary Coalescer, Effluent Transfer Pump & Nema 4 Control Panel, Effluent Solids Filter, AQAM Polishing Filter, Flow Meter, Carbon Steel Skid. The VEW-A systems also incorporate the AQAM filter.

#### 1.02 Oil/Water Separator Design

The OS series oil/water separator will be designed and fabricated per the following specifications. Rectangular tankage with features and components as described designed per API #421 Design & Operation of Oil/Water Separators Manual, February 1990 and Stokes law. The design will incorporate flexible flow rating capability based on application parameters.

#### 1.03 Influent Chamber

Influent flow enters the clog proof influent diffuser pipe and is immediately spread out across the depth and width of the chamber. Any readily settleable solids drop to the bottom of the V-shaped solids accumulation chamber located directly under the coalescing media bundle.

#### 1.04 Oil/Water Separation Chamber

The separation chamber is to be packed with Flopak cross-fluted coalescing media. The media pack will be designed to create a quiescent zone, a laminar flow pattern to facilitate the impingement of oil on the media, and will provide numerous impact sites and changes of flow direction. The media shall have a 60-degree cross-flute angle.

A Retpak, secondary, reticulated coalescing media pack is also provided to increase performance by capturing smaller oil drops.

#### 1.05 Cylindrical Oil Skimmer

The separator shall be provided with an adjustable cylindrical oil skimmer that allows the skim head to be

readily removed or adjusted without tools. The skim head rotation collar will be provided with Buna-N seal. The oil skimmer is to be located at the effluent end of the separation chamber. The skimmer shall not require lubrication for operation.

#### 1.06 Solids Accumulation Hopper

The separator shall have a V-shaped solids accumulation hopper located under the coalescing media. This chamber will provide temporary solids storage. The hopper walls are to be pitched at 45 degrees to assure simple and thorough solids removal. Dual outlet ports will be provided for sludge removal.

#### 1.07 Clean Water Effluent Chamber

The cleansed water will flow under the oil baffle, over the water weir and into the effluent chamber. The effluent transfer pump will draw flow from the suction fitting in this chamber.

#### 1.08 Separator Cover

The separator is to have a single piece cover that provides complete closure of the tank. The separator cover will be mounted to the tank via quick release hardware and vapor sealed with an industrial grade closed cell, compressible EPDM gasket.

#### 1.09 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.

#### 1.10 Fittings

All wetted fittings must be fiberglass constructed, integral, fiberglass bond to the tank for permanent, leak resistant fitting seal. Tank penetrating, gasketed bulkhead fittings or couplings are not to be used.

## Section 2.0 Materials of Construction

#### 2.01 Fiberglass Construction

Tank shell, baffles and cover shall be molded of premium grade DION 6694 corrosion proof resin with a minimum of 25% chopped fiberglass fiber to resin mix. An ultraviolet stabilized gel coat shall be used to coat external surfaces 16-20 mils dft.

#### 2.02 Piping

Internal/external piping shall be type 1, grade 1PVC, schedule 80.

### 2.03 Coalescing Media

Cross-fluted, oleophilic, PVC Flopak and polyurethane Retpak coalescing medias shall be provided as manufactured by Pan America Environmental.

### 2.04 Cover Gasketing

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

## 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. The pump will be a centrifugal design with TEFC motor. The pump is to be controlled via a Nema 4 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. A flowmeter will be provided to accurately indicate system flow rate. The entire pumpout system will be mounted, plumbed and wired to the VEW system skid and plumbed via ASTM, D-1784, schedule 80 PVC. Power disconnect optional. Power required: 115V/1ph/60Hz. Other voltages available.

### 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 down to the 20-micron (nominal) size level. 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.

### 3.04 AQAM Polishing Filter (VEW-A Version)

The AQAM polishing filter is designed for the selective adsorption of free, dispersed oils, sheens, slightly soluble chlorinated hydrocarbons and high molecular weight organics. The AQAM media is an Alkyl Quaternary Ammonium Montmorillonite (AQAM) material distributed in a support bed of anthracite coal. The filter housing may be fiberglass or steel construction that allows removal and refill of exhausted media. The type of vessel provided is determined by PAE according to flow rate and application requirements. The vessel is provided with internal distributors that distribute and collect the flow evenly throughout the media bed to avoid channeling and incomplete exposure of the AQAM media to the waste flow.

### 3.04.1 AQAM Filter Cell Construction

The AQAM filter cell construction shall be coated steel or fiberglass. Filter cell is designed for operating pressures up to 100 psi. Construction can also be based on material availability at time of order.

### 3.04.2 Filter Cell Piping

Filter cell external piping shall be schedule 80, ASTM, D1785 PVC. Internal distributor and pickup pipe shall be schedule 80, ASTM, D1785 PVC.

### 3.04.3 Mounting Hardware

The AQAM filter will be mounted to the system skid via zinc plated steel brackets and attaching hardware.

### 3.04.4 AQAM Performance

The AQAM media functions by absorbing contaminant(s). The media will remove as much as 50% of its own weight in contaminant. Due to its modified nature AQAM media is hydrophobic and organophilic (oil attracting). These characteristics allow it to remove contaminant while minimizing water absorption. Oil removal of 5 mg/L or less can be attained.

### 3.05 System Skid

The system will be provided mounted, plumbed and wired to a forkliftable skid constructed of A-36 carbon steel. The external surfaces shall be prepared to an SSPC-SP6 finish followed by a prime coat and industrial polyurethane enamel coating (6 mils dft min.) (standard color is white).

### 3.06 Manufacturer

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

### 3.05 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.

## Section 4.0 System Operational Details

### 4.01 Maintenance and Operation

The VEW systems contain two consumable products. 1. Filter bags (solids filtration) 2. AQAM filter media. The life expectancy of each is determined by influent loadings put into them. PAE can estimate the life expectancy of the AQAM media by computer calculation. To do this we will need: flow rate, hours per day system is used, days per week system is used and contaminants in wastestream.

The system requires 115V/1pH/60Hz, 15 amp electrical to operate the control panel and effluent pump system.

To maintain the system you must:

1. Remove oils from external storage drum/tank,
2. Remove solids from oil/water separator hopper and solids filter
3. Clean out Flopak & Retpak media (if needed)
4. Check overall system for proper operation.

### 4.02 System Electrical Requirements

Electrical supply: 115V/1ph/60Hz  
Amp load: 15-35

### Available Options

- Influent/Oil/Sludge Pumping Systems
- Elevated Design
- Ozone/Biocide System
- External Storage Tanks
- Hi-Temp Upgrade
- Emulsion Cracking System
- Air Stripper
- Walkway/Platform
- Nema 7 Explosion Proof Designs
- GAC Filtration
- Containerized Construction
- Trailer Mounted Design
- Repressurization/Water Return System

### 4.03 Wash Detergent Recommendation

When using a detergent to clean parts and vehicles you will typically create an emulsion that will pass through the VEW to some degree unless the AQAM filter has been sized for greater emulsion removal ability. By standard design some emulsion will be captured, however, the VEW is not designed to remove high loads of emulsion. PAE recommends the use of a detergent that can break the emulsion it creates. In order to effectively break the emulsion. The wastestream may need a holding tank to give the cleaner time to break the emulsion, then you can treat it in the VEW system. Pan America can provide this holding tank if desired.

If you are creating an emulsion and your detergent does not break its emulsion then additional treatment equipment would be needed to remove the emulsion.

Manufacturers of self-demulsifying detergents for more information:

Tomah [www.tomah3.com](http://www.tomah3.com) Product: Formula T-101  
Kemper Industries [www.kemperindustries.com](http://www.kemperindustries.com) Product: MEK-2000

## VEW System Specification

Models: VEW12 & VEW16

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### Implementation

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#### 1.04 Oil/Water Separation Chamber

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A Retpak, secondary, reticulated coalescing media pack is also provided to increase performance by capturing smaller oil drops.

#### 1.05 Cylindrical Oil Skimmer

The separator shall be provided with an adjustable cylindrical oil skimmer that allows the skim head to be readily removed or adjusted without tools. The skim head rotation collar will be provided with Buna-N seal. The oil skimmer is to be located at the effluent end of the separation chamber. The skimmer shall not require lubrication for operation.

#### 1.06 Solids Accumulation Hopper

The separator shall have a V-shaped solids accumulation hopper located under the coalescing media. This chamber will provide temporary solids storage. The hopper walls are to be pitched at 45 degrees to assure simple and thorough solids removal. Dual outlet ports will be provided for sludge removal.

#### 1.07 Clean Water Effluent Chamber

The cleansed water will flow under the oil baffle, over the water weir and into the effluent chamber. The effluent transfer pump will draw flow from the suction fitting in this chamber.

#### 1.08 Separator Cover

The separator is to have a single piece cover that provides complete closure of the tank. The separator cover will be mounted to the tank via quick release hardware and vapor sealed with an industrial grade closed cell, compressible EPDM gasket.

#### 1.09 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.

#### 1.10 Fittings

All wetted fittings must be fiberglass constructed, integral, fiberglass bond to the tank for permanent, leak resistant fitting seal. Tank penetrating, gasketed bulkhead fittings or couplings are not to be used.

## Section 2.0 Materials of Construction

### 2.01 Fiberglass Construction

Tank shell, baffles and cover shall be molded of premium grade DION 6694 corrosion proof resin with a minimum of 25% chopped fiberglass fiber to resin mix. An ultraviolet stabilized gel coat shall be used to coat external surfaces 16-20 mils dft.

### 2.02 Piping

Internal/external piping shall be type 1, grade 1PVC, schedule 80.

### 2.03 Coalescing Media

Cross-fluted, oleophilic, PVC Flopak and polyurethane Retpak coalescing medias shall be provided as manufactured by Pan America Environmental.

#### 2.04 Cover Gasketing

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

## 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. The pump will be a centrifugal design with TEFC motor. The pump is to be controlled via a Nema 4 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. A flowmeter will be provided to accurately indicate system flow rate. The entire pumpout system will be mounted, plumbed and wired to the VEW system skid and plumbed via ASTM, D-1784, schedule 80 PVC. Power disconnect provided. Power required: 230V/3ph/60Hz. Other voltages available.

#### 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 down to the 20-micron (nominal) size level. 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.

#### 3.04 AQAM Polishing Filter (VEW-A Version)

The AQAM polishing filter is designed for the selective adsorption of free, dispersed oils, sheens, slightly soluble chlorinated hydrocarbons and high molecular weight organics. The AQAM media is an Alkyl Quaternary Ammonium Montmorillonite (AQAM) material distributed in a support bed of anthracite coal. The filter housing may be fiberglass or steel construction that allows removal and refill of exhausted media. The type of vessel provided is determined by PAE according to flow rate and application requirements. The vessel is provided with internal distributors that distribute and collect the flow evenly throughout the media bed to avoid channeling and incomplete exposure of the AQAM media to the waste flow.

#### 3.04.1 AQAM Filter Cell Construction

The AQAM filter cell construction shall be coated steel or fiberglass. Filter cell is designed for operating pressures up to 100 psi. Construction can also be based on material availability at time of order. The filter vessel is mounted at the end of the system skid and plumbed into the effluent pump discharge.

#### 3.04.2 Filter Cell Piping

Filter cell external piping shall be schedule 80, ASTM, D1785 PVC. Internal distributor and pickup pipe shall be schedule 80, ASTM, D1785 PVC.

#### 3.04.3 Mounting Hardware

The AQAM filter will be mounted to the system skid via zinc plated steel brackets and attaching hardware.

#### 3.04.4 AQAM Performance

The AQAM media functions by absorbing contaminant(s). The media will remove as much as 50% of its own weight in contaminant. Due to its modified nature AQAM media is hydrophobic and organophilic (oil attracting). These characteristics allow it to remove contaminant while minimizing water absorption. Oil removal of 5 mg/L or less can be attained.

#### 3.05 System Skid

The system will be provided mounted, plumbed and wired to a forkliftable skid constructed of A-36 carbon steel. The external surfaces shall be prepared to an SSPC-SP6 finish followed by a prime coat and industrial polyurethane enamel coating (6 mils dft min.) (standard color is white).

#### 3.06 Manufacturer

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

#### 3.05 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.

## Section 4.0 System Operational Details

#### 4.01 Maintenance and Operation

The VEW systems contain two consumable products. **1.** Filter bags (solids filtration) **2.** AQAM filter media. The life expectancy of each is determined by influent loadings put into them. PAE can estimate the life expectancy of the AQAM media by computer calculation. To do this we will need: flow rate, hours per day system is used, days per week system is used and contaminants in wastestream.

The system requires 230V/3pH/60Hz, 15 amp electrical to operate the control panel and effluent pump system.

To maintain the system you must:

5. Remove oils from external storage drum/tank,
6. Remove solids from oil/water separator hopper and solids filter
7. Clean out Flopak & Retpak media (if needed)
8. Check overall system for proper operation.

#### 4.02 System Electrical Requirements

Electrical supply: 230V/3ph/60Hz  
Amp load: 10-25

### Available Options

- Influent/Oil/Sludge Pumping Systems
- Elevated Design
- Ozone/Biocide System
- External Storage Tanks
- Hi-Temp Upgrade
- Emulsion Cracking System
- Air Stripper
- Walkway/Platform
- Nema 7 Explosion Proof Designs
- GAC Filtration
- Containerized Construction
- Trailer Mounted Design
- Repressurization/Water Return System

#### 4.03 Wash Detergent Recommendation

When using a detergent to clean parts and vehicles you will typically create an emulsion that will pass through the VEW to some degree unless the AQAM filter has been sized for greater emulsion removal ability. By standard design some emulsion will be captured, however, the VEW is not designed to remove high loads of emulsion. PAE recommends the use of a detergent that can break the emulsion it creates. In order to effectively break the emulsion. The wastestream may need a holding tank to give the cleaner time to break the emulsion, then you can treat it in the VEW system. Pan America can provide this holding tank if desired.

If you are creating an emulsion and your detergent does not break its emulsion then additional treatment equipment would be needed to remove the emulsion.

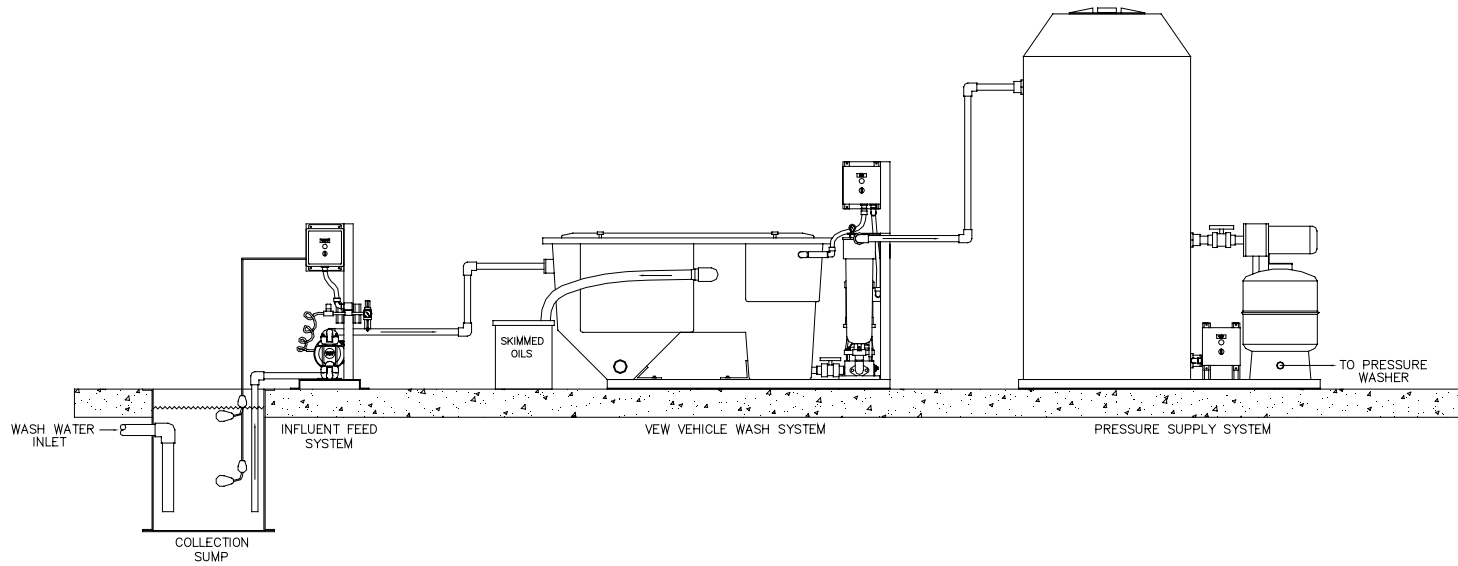
Manufacturers of self-demulsifying detergents for more information:

Tomah [www.tomah3.com](http://www.tomah3.com) Product: Formula T-101  
Kemper Industries [www.kemperindustries.com](http://www.kemperindustries.com) Product: MEK-2000

Model  
VEV

# VEV

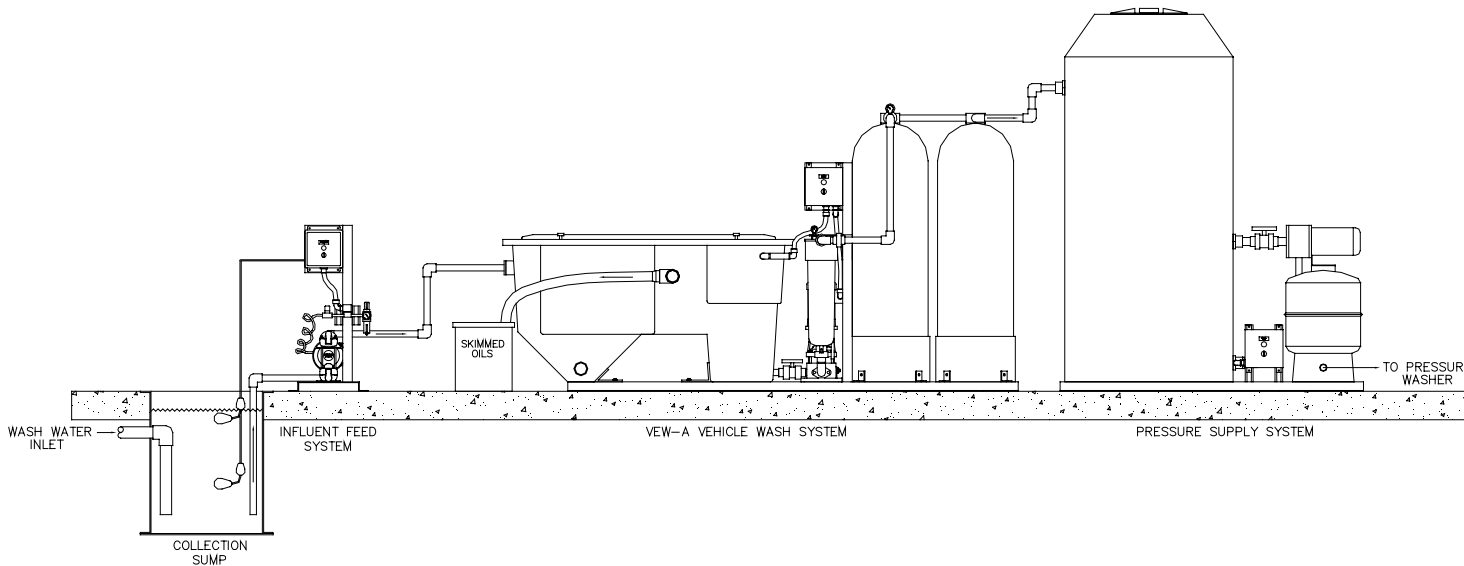
Vehicle Equipment  
Washwater Treatment



The VEV systems can be combined with optional systems to complete your project design.

**Options Include:**

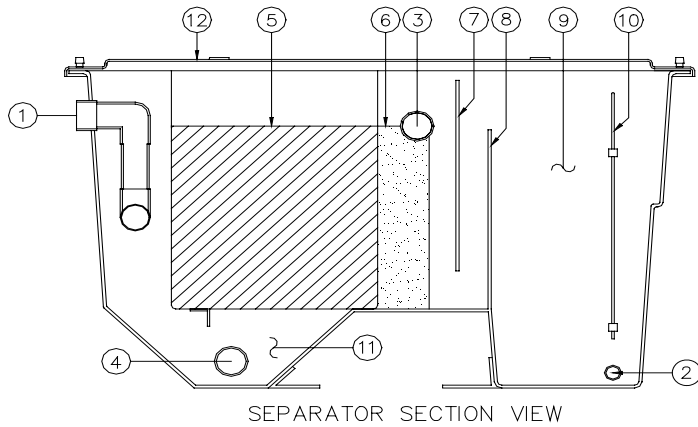
- Influent Feed System
- Oil Collection
- Collection Sump
- Pressure Supply Module
- Ozonator



Model  
VEW

# VEW

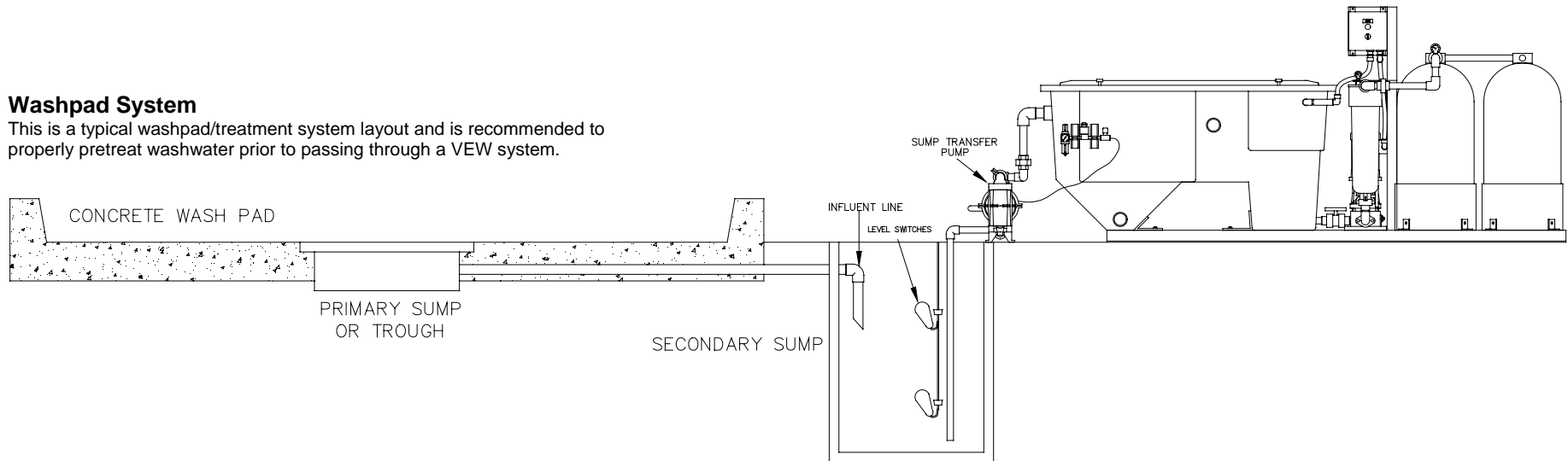
Vehicle Equipment  
Washwater Treatment



Item	QTY	Description	Item	QTY	Description	Item	QTY	Description	Item	QTY	Description
1	1	Inlet	4	2	Sludge Out let	7	1	Oil Baffle	10	1	Level Switch
2	1	Outlet	5	1	Flopak Media	8	1	Water Weir	11	1	V-hopper
3	1	Oil Outlet	6	1	Retpak Media	9	1	Effluent Tank	12	1	Cover

## Washpad System

This is a typical washpad/treatment system layout and is recommended to properly pretreat washwater prior to passing through a VEW system.



## VEW Systems Options Descriptions

**Influent Feed System** Air operated, diaphragm pump with air controls or progressive cavity pump, sump level switches & Nema 4 control panel, base mounted, 115/230/460V power offered. Electric diaphragm pumps available.

**Effluent Pumpout** Centrifugal pump with level switches & Nema 4 control panel, base mounted, 115/230/460V power offered. External effluent tank is provided to supply water to pump.

**Sludge Pumpout System** Air operated, diaphragm pump with air controls & Nema 4 control panel, auto on/off timer, base mounted, 115V/1ph/60Hz power req'd. Progressive cavity pump system also available. 1 - 100 GPM.

**Oil Pumpout System** Air operated, diaphragm pump with air controls, level switches & Nema 4 control panel, base mounted, 115V/1ph/60Hz power req'd., external oil drum & transfer piping. Gear pump is available as an alternative. 1 - 100 GPM

**Pressurized Supply Module** Clean water from the VEW can be pressurized and re-supplied to pressure washer or other discharge point. Module consists of a clean water tank, pressurization pump and pump controls.

**Freeze Protection** Immersion heaters mounted through tank wall. Each heater has an independent thermocouple well, 0-100 deg. F thermostat and Nema 1 (or optional Nema 4) housing. 230/460V/3ph/60Hz power req'd.

**Oil Sight Glass** Two automatic, brass valves with tempered sight glass and protection rods mounted in oil reservoir. If glass is broken check ball stops outflow from reservoir.

**External Sight / Level Glass** An externally mounted clear PVC sight tube is provided with multi-point level switch for indication or pump control of oil or water. Switch is removable for cleaning and inspection.

**Elevation Stand & Platforms** Epoxy coated steel stand or legs to elevate system to desired level. Standard deck height is 30". Full platforms & walkways with ladders or stairways can be designed where required or desired.

**High Temperature Design** Flopak coalescing media and any piping is constructed of a combination of CPVC &/or polypropylene (or other materials) for temperature resistance up to 200° F.

**Alternate Media Construction** Standard Flopak media is PVC. HPVC, polypropylene, glass-coupled polypropylene and 304/316 stainless media is available. Contact PAE to determine proper media type for your application. Media plate spacing is available in 1/2", 3/4" & 1.2".

**External Storage/Feed Tanks** A wide variety of tank volumes can be supplied for your water, product and sludge holding needs. Flat bottom and cone bottom designs constructed in polyethylene, fiberglass, steel & stainless steel can be provided.

**AQAM Filter Systems** AQAM (Alkyl Quaternary Ammonium Montmorillonite) filter systems can be provided to remove trace hydrocarbons, sheens, DNAPLs, slightly soluble chlorinated hydrocarbons and high molecular weight organics from the separator effluent. Contact Pan America to determine proper filtration needs for your application. Can be used to protect and increase GAC lifespan.

**Carbon Filtration Systems (GAC)** GAC carbon filters can be provided to remove contaminants after the separator. Contact Pan America to determine proper system needs for your application.

**Emulsion Cracking Systems** Emulsion cracking systems can be provided to remove oil-in-water emulsions prior to the separator. Contact Pan America to determine proper system needs for your application.

**pH Adjustment Systems** pH adjustment systems can be provided to maintain pH levels prior to or after the separator. Contact Pan America to determine proper system needs for your application.

**System Containerization** OS separators with any options can be installed in a 20 or 40' shipping container(s) to simplify system provision and field implementation. System would include the complete mounting, piping and wiring of the system in one or more container as required by the project.

**Trailer Mounting** OS separators can be mounted on a trailer for system mobilization. Trailer design generally includes corner leveling jacks, bubble levels, walkway, toolbox, electric or hydraulic brakes, piping and wiring of options.

**Field Skid Mounting** OS separator system can be mounted to a mobile skid with leveling for quick field mobilization.

**Skid Mounted System** OS separators can be combined with our other treatment equipment and options into a fully integrated, custom designed system completely mounted, plumbed and wired to a system skid. To simplify your need to do the wiring and plumbing on site, reducing your time frames and on site costs, we design around your requirements.

**Vent Scrubber** Separator vapors can be extracted and scrubbed prior to discharge to atmosphere to remove VOC content.

**Level Sensors** Level sensors can be provided to detect water and oil/fuels. One or more sensor points can be provided to perform various functions such as high level, low level, pump on/off based on liquid levels and level detection for DCS controls or other functions based on your needs.

**Class 1 Div 1 & 2** Systems can be designed for use in a class 1 div 1 or 2 environment. Controls, components and wiring are changed to meet the needs of these environments. Intrinsically safe relays are also used for level sensors.

**Oil Monitor** An oil detection system can be provided to monitor effluent oil content and provide various actions based on the oil alarm setpoint. Actions might include: audible/visual alarm, redirection of influent or effluent via actuated valve, shutdown of influent pump or your custom action.



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