ANUE
WATER TECHNOLOGIES

Custom Engineered Odor Control Systems

Flexible Reinforced Geo-membranes

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ANUE WATER TECHNOLOGIES

Diverse Application Universe

Anything Needing Odor Control

ANUE WATER TECHNOLOGIES

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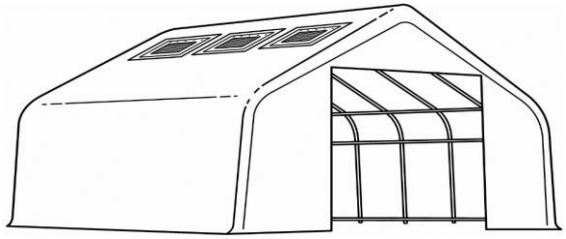
- Sludge Pits
- Open Channels
- Vessels
- Manhole Covers
- Truck Bays
- Vertical Vents
- Fugitive Emissions Vent Covers



Exceptional Value Proposition

Quick Payback, Great Results

- Exceptional Broad Spectrum Odor Control
- Eco Friendly – No Power
- Low CapEx and OpEx
- Made in North America
- Engineered to any shape, size, dimension, application
- Simple, quick installation
- Can deal with any type odor
- Long lasting filters

Custom Engineered

Low Cost

Geo-Membrane Description

Engineered Pockets Contain Filters

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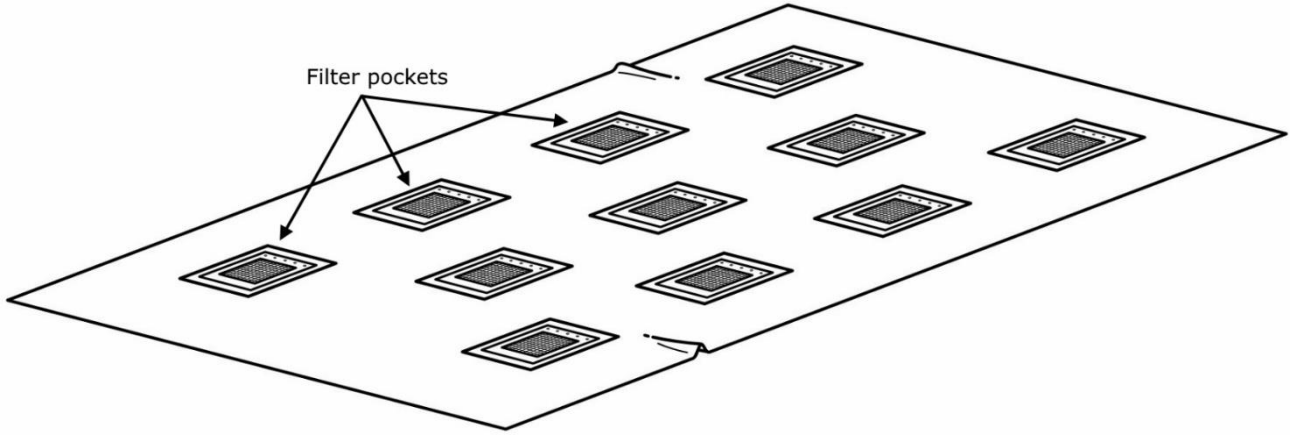

Filters are integrated into the Geo-membrane

- Filters easy to insert/maintain
- Pocket closes on 3 sides
- Designed to force gases through the filter
- Covered with mesh to protect from debris
- Reinforced bottom

Geo-Membrane Filter
Specialty Filter Components

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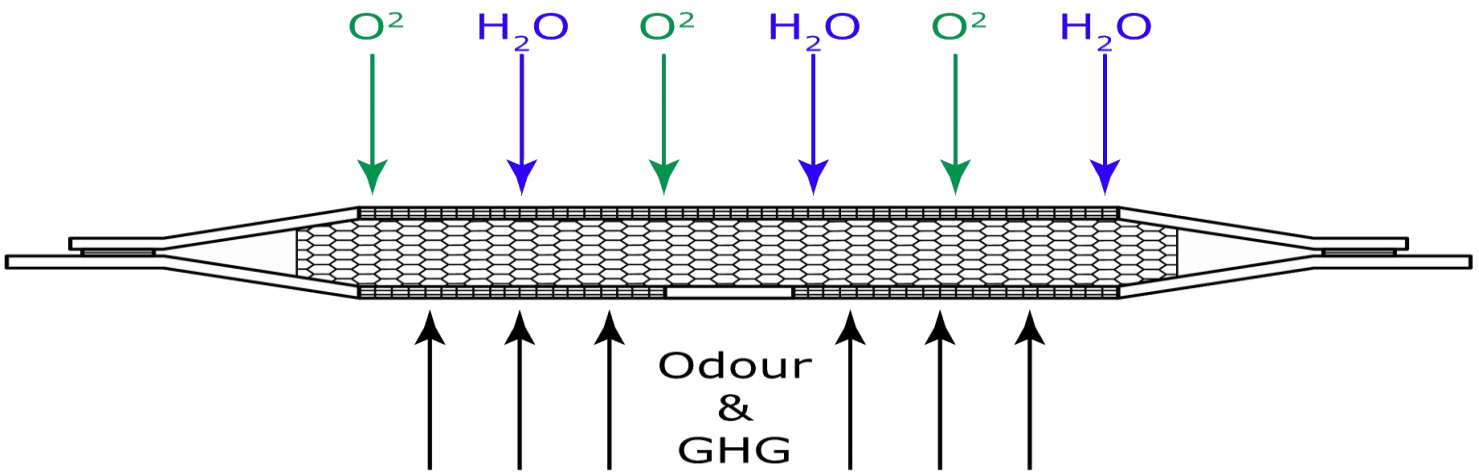

- Filters are in a sponge- like medium (standard size 1 m^2/10.8 ft^2)
- Gas flows freely through filters
- Filters act as rain water drain into the basin
- Rain water does not wash away odor capturing ability
- General or Gas specific filters available (H_2S & NH_3)

Geo-Membrane Installation
Simple for Maintenance to Install

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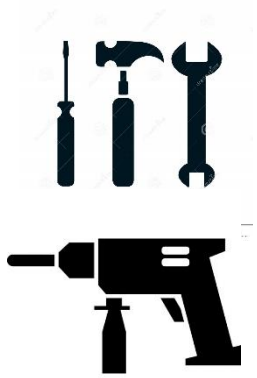
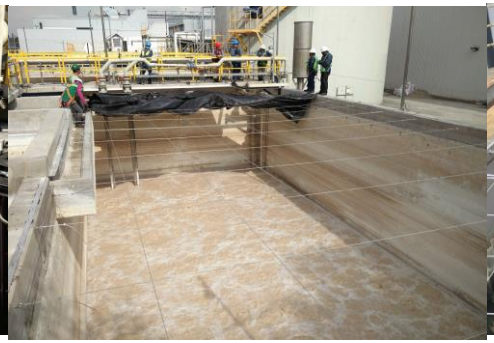
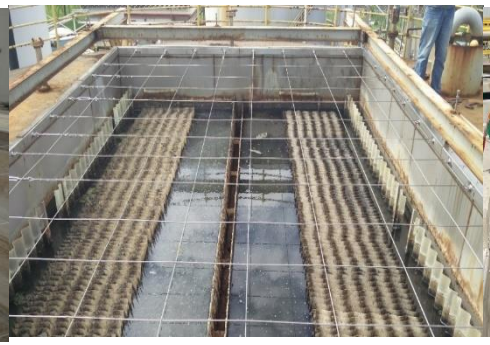


- Easily installed by maintenance staff
- High strength cable holds Geo-membrane
- Membrane perimeter sealed with batten bars
- Installation time 10 man hours/100 ft^2
- Easy to maintain and change filters
- Suspended structure - not affected by aeration, level changes, foam


Geo-Membrane Economics

Excellent Odor Control with Low Costs

- Overall cost is low compared to functional alternatives
- Low CapEx and OpEx
- Please contact Anue for detailed cost information.

Proven Technology

Commercialized In 18 Countries….

… Now Available in the Americas through Anue Water Technology Channel Partners

Appendix A: Case Study 1

Bottling Safety and $$$ Saving

The Challenge: Major soft drink bottler receiving odor complaints from nearby hotel. Problematic gas accumulation incident at plant site. Chemicals used but ineffective.

The Solution: Bottler buys custom Geo-Membrane solution Jan 2018. Savings on chemicals >$240k/yr; 4 month payback. Additional savings on labor and maintenance.

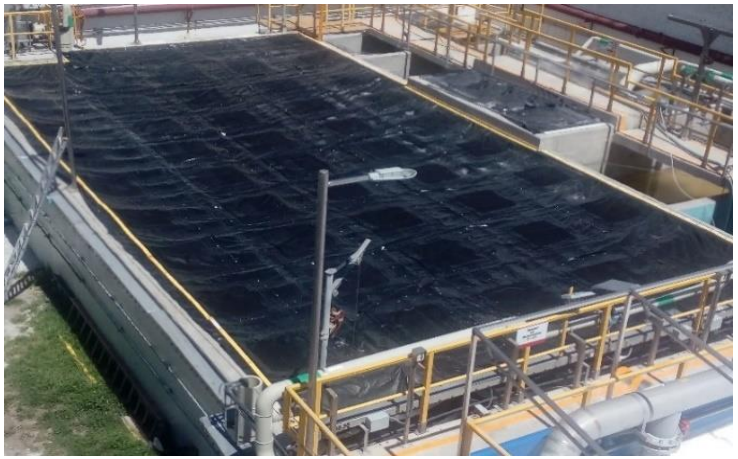
Appendix A: Case Study 2

Dairy Odor Issue

The Challenge: Large Dairy receiving complaints of strong odors with complaints from neighbors and businesses, who pressured local government to act. Solutions first considered were rigid cover with extraction, and masking agents. Proposed cost too high.

The Solution: Dairy purchased Geo-Membrane system. A support beam was provided by the manufacturer to ensure a perfect seal where pipes were obstructing.

3rd Party proves odor decrease >90%!

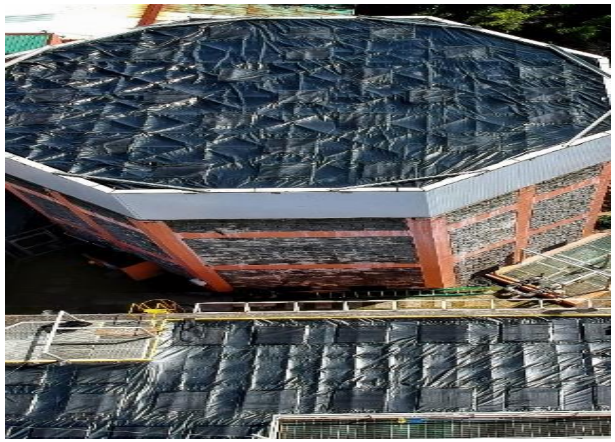


Appendix A: Case Study 3

Soft Drink Plant Odor Problem

The Challenge: 7 odor sources from major soft drink manufacturer drives pressure from Ministry of Environment. Problem is extreme odor from tall trickling filter/equalization tank with bridge & agitator.

The Solution: First candidates were misting equipment, rigid cover; deemed too expensive. Installation of Geo-Membrane chosen and completed in 2 weeks. 3rd party testing show >90% odor reduction achieved. Local government now recommends to other industries too!



Appendix B
Specifications and Compatibility

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Membrane, filter & batten bar specifications

Membrane without Filters	
Weight	1017 g/m² (~0.21 lb/ft²)
Thickness	0.76 mm (~1/32")
Tear Strength	175/245 N
Breaking Yield Strength	2448/2488 N
Puncture Resistance	1200 N
Temperature resistance	-34°C - +100°C (-29°F - 212°F)

Filter (Activated Carbon LL20)	
Weight	1500 g/m² ± 40 (~0.31 lb/ft²)
Wet-weight (H2O)	< 4500 g/m² (<107 lb/ft²)
Thickness	20 mm ± 1 (~13/16")
Carbon content	≥ 900 g/m² (≥0.19 lb/ft²)
Resistance (Pa)	≤ 25
Temperature resistance	-35°C - +85°C (-31°F - 185°F)

Batten Bars	
Material	Extruded Aluminium Alloy
Width	50.8 mm (2 in.)
Thickness	4.7625 mm (3/16 in.)
Holes	6.35 mm (1/4 in.)

Appendix B
Resistance Properties

Heavy duty resistance to: UV-rays, Hot water (93°C/200°F), Hydrochloric/Phosphoric/Sulfuric acids Jet fuel (A, 4, 5, 8), Kerosene, Oils, Sea water.

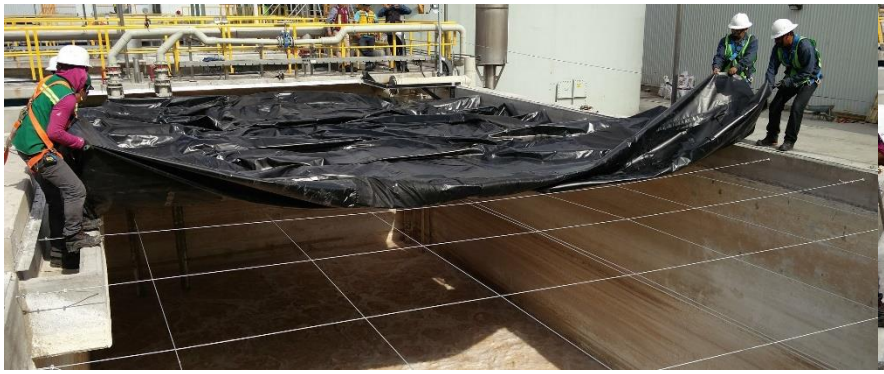
Extensive Data Available:

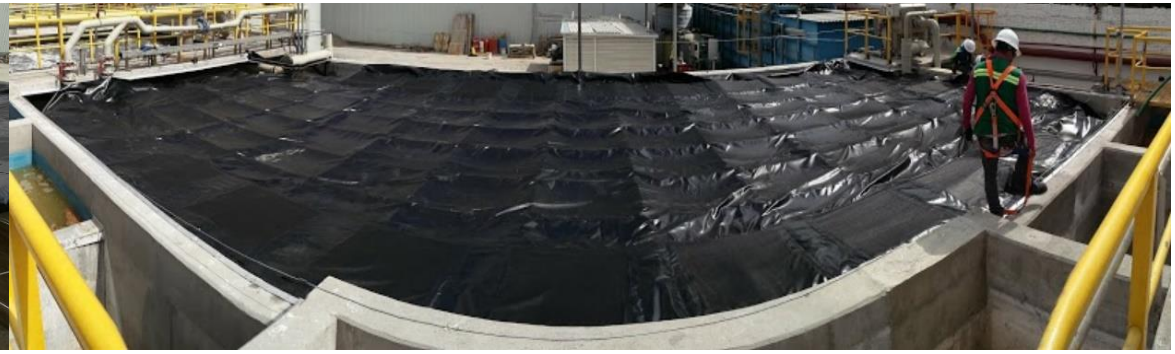
EXPOSURE	RATING	EXPOSURE	RATING
AFFF	A	JP-4 Jet Fuel	A
Acetic Acid (5%)	B	JP-5 Jet Fuel	A
Acetic Acid (50%)	C	JP-8 Jet Fuel	A
Ammonium Phosphate	T	Kerosene	A
Ammonium Sulfate	T	Magnesium Chloride	T
Antifreeze (ethylene glycol)	A	Magnesium Hydroxide	T
Animal Oil	A	M ethanol	A
Aqua Regia	X	Methyl Alcohol	A
ASTM Fuel A (100% Iso-octane)	A	Methyl Ethyl Ketone	X
ASTM Oil #2 (Flash pt. 240° C)	A	Mineral Spirits	A
ASTM Oil #3	A	Naphtha	A
Benzene	X	Nitric Acid (5%)	B
Calcium Chloride Solutions	T	Nitric Acid (50%)	C
Calcium Hydroxide	T	Perchlorethylene	C
20% Chlorine Solution	A	Phenol	X
Clorox	A	Phenol Formaldehyde	B
Conc. Ammonium Hydroxide	A	Phosphoric Acid (50%)	A
Corn Oil	A	Phosphoric Acid (100%)	C
Crude Oil	A	Phthalate Plasticizer	C
Diesel Fuel	A	Potassium Chloride	T
Ethanol	A	Potassium Sulphate	T
Ethyl Acetate	C	Raw Linseed Oil	A
Ethyl Alcohol	A	SAE-30 Oil	A
Fertilizer Solution	A	Saltwater (25%)	B
#2 Fuel Oil	A	Sea Water	A
#6 Fuel Oil	A	Sodium Acetate Solutions	T
Furfural	X	Sodium Bi-sulfite Solution	T
Gasoline	B	Sodium Hydroxide (60%)	A
Glycerin	A	Sodium Phosphate	T
Hydraulic Fluid- Petroleum Based	A	Sulphuric Acid (50%)	A
Hydraulic Fluid- Phosphate Ester Based	C	Tannic Acid (50%)	A
Hydrocarbon Type II (40% Aromatic)	C	Toluene	C
Hydrochloric Acid (50%)	A	Transformer Oil	A
Hydrofluoric Acid (5%)	A	Turpentine	A
Hydrofluoric Acid (50%)	A	Urea Formaldehyde	A
Hydrofluosilicic Acid (30%)	A	UAN	A
Isopropyl Alcohol	T	Vegetable Oil	A
Ivory Soap	A	Water (200°F)	A
Jet A	A	Xylene	X
		Zinc Chloride	T

Appendix C: Additional Photos

Deployment





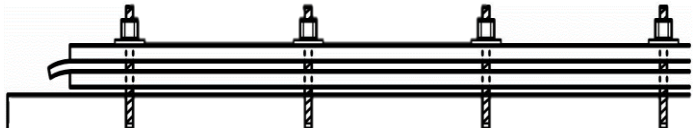
Appendix C: Additional Photos

Design Fine-tuning

Support beams & tight seal around pipes



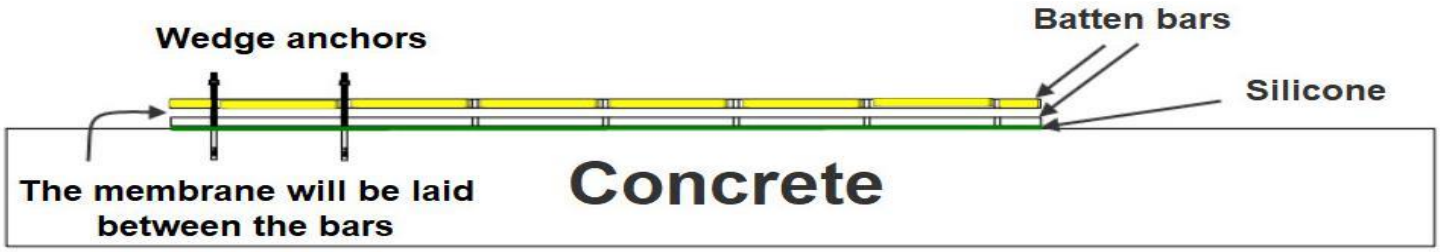
Securely fixed and sealed with high visibility batten bars



Appendix C: Additional Photos

Installation

Support hardware: Anchors, wires, brackets, bars



Appendix C: Additional Photos

Maintenance: Two Simple Steps

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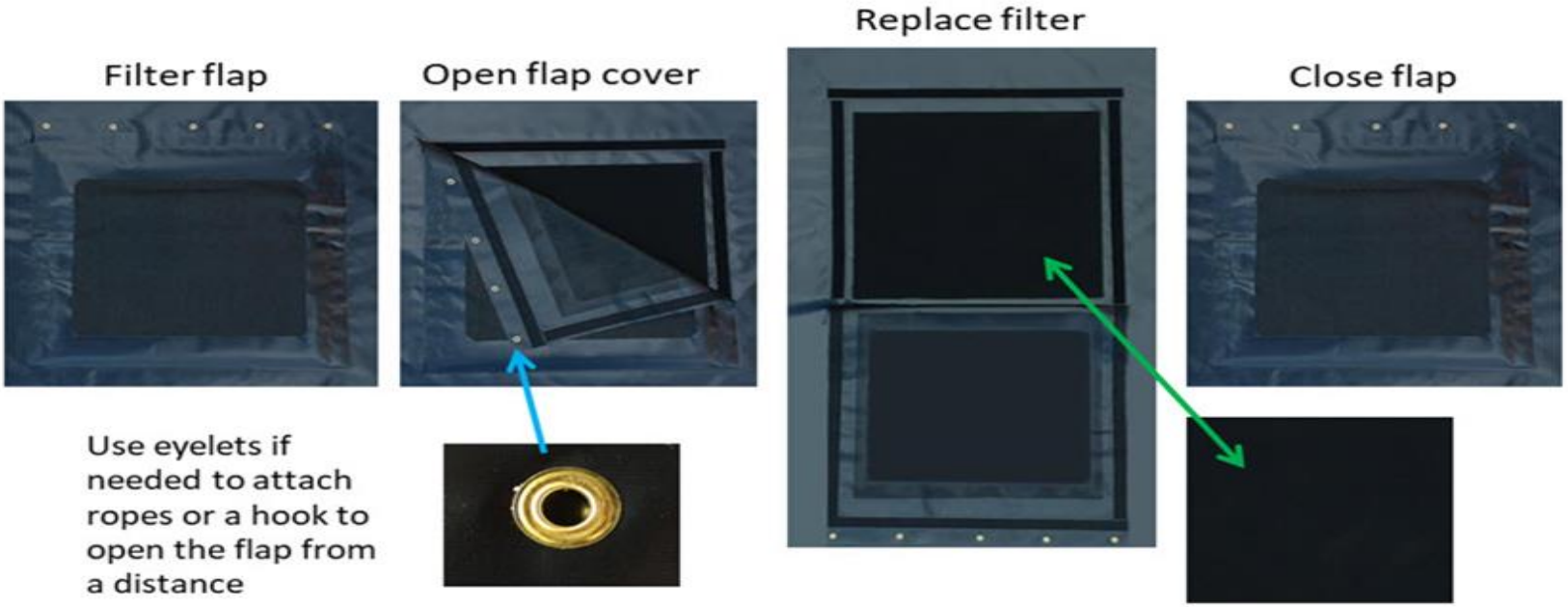
- Keep the filter areas free of major debris
- Change Filter every 6 to 12 months



Appendix C: Additional Photos

Other Applications

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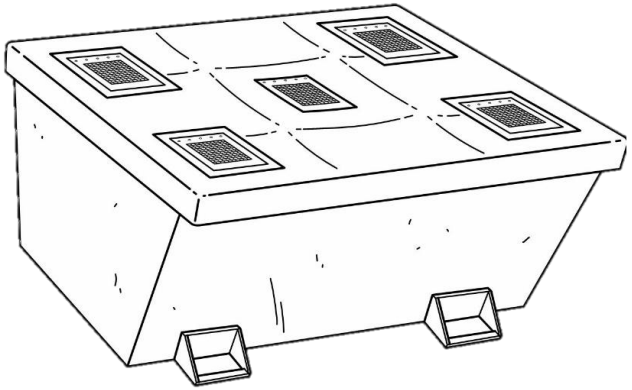
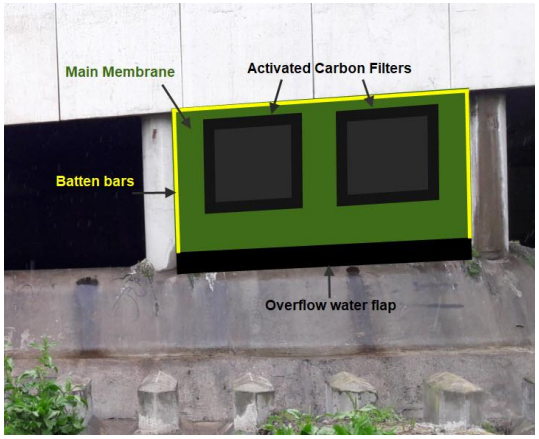
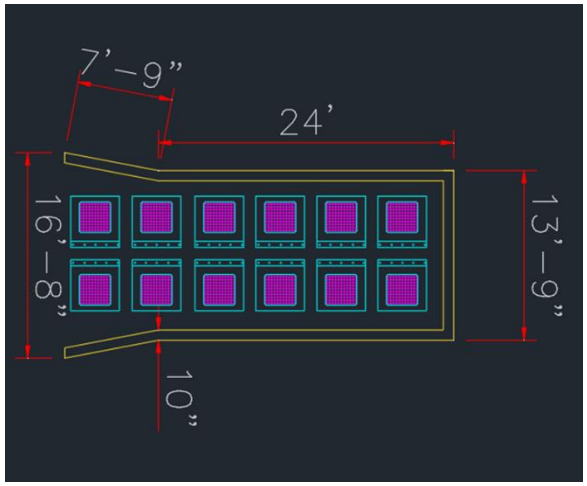


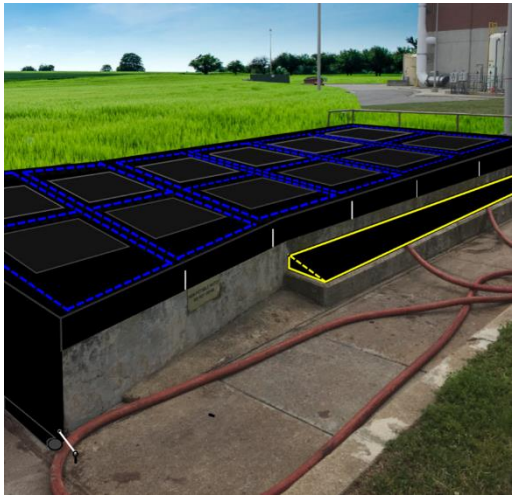
Container cover



Vertical installation

Manhole/drain





Engineered Sludge Pit Cover (above 3 pics)

Appendix C: Additional Photos

Fugitive emissions

Vents/grates can easily be fitted with the filters