### **Wastewater Technologies**

The Developer must choose a technology that will meet the high level of treatment required to meet Type 2 Reuse Wastewater standards, **Exhibit J.5**. In addition, the technology must have the capabilities of being placed near existing developments without having any significant noise, odor, or visual issues. The Developer consider membrane bioreactor technology (MBR) before choosing the AquaPoint's AquaFast system. The MBR systems available at the time had two major issues. 1. Is that the plants were fairy loud because of the blowers that pushed air into the treatment process and poly membranes were expensive to replace and maintain. One manufacturer of MBR plants revealed that both issues have been solved with the adaptation of low noise blowers and baffles to the equipment and the development of ceramic membranes that replace the poly membrane being used. These developments have made the MBR equipment from OVIVO (attached) the technology of choice for this development.

Exhibit J.7

The Developer will continue to review technologies up until the time of purchase and build to make sure they have chosen the best technology and equipment for Herndon Farms.







# microBLOX® MBR SYSTEMS



Branded as microBLOX, the facility design and layout is intended to provide low construction costs, low O&M, process stability, flexible design and operational ease. Contractor estimates indicate that systems may cost as much as 25-50% less due to the ready-to-operate design, reduced footprint, reduced concrete, reduced building, and overall simplicity.

However, one size does not fit all. For every project, we begin the design process by understanding client needs and identifying scope before ultimately tailoring a solution specific to the application through the use of modular building blox.

# microBLOX® MBR SYSTEMS



#### 3Z microBLOX®

< 75,000 GPD



#### 4Z microBLOX®

15,000 GPD to 150,000 GPD



#### XL microBLOX®

150,000 GPD to 250,000 GPD

#### STANDARD FEATURES

- SiC Ceramic Membranes
- 6mm Coarse & 2mm Fine Screen
- Automated Re-screen
- Automated WAS
- Automated Maintenance Clean
- Access Stairs
- Grating or Sealed Covers with Access Points
- Walkway and Rails
- VFDs for Blowers and Pumps
- Portable Crane & Davits
- Disconnects and Lockouts
- Convience Outlets
- TSS, Turbity and DO Instrumentation
- Porch Lights
- Optional UV System
- Multiple Paint Colors

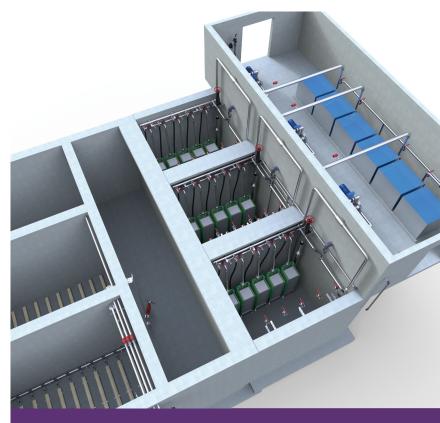
#### **COMPLIANCE**

- American Iron and Steel Act
- Siesmic Rated to Category D
- NFPA 820
- UL Panel

# **INTEGRATED MBR SYSTEMS**

Since 2001, Ovivo MBR has played a pivotal role in establishing and innovating submerged MBR technology in North America. Continuing on our technology and market advancement, Ovivo MBR is 100% dedicated to integrating Silicon Carbide (SiC) membrane technology into our MBR Systems.

The heart of the system is Ovivo's Ceramic Membrane Technology, comprised of hydrophilic Silicon Carbide UF/MF (0.1µ) flat plate membranes which provides unmatched flux rate while also repelling negatively charged particles. The chemically inert membrane can operate in extreme environments such as a pH range from 1-14 and high sludge concentrations of 4% organic waste. The plates have a high resistance to chemicals, oxidants, and even ozone. The hydrophilic nature of the membranes allows the membrane basins to be shut down and drained without the addition of preservatives.



100% INTEGRATION WITH SILICON CARBIDE MEMBRANES



Solid Design Practices

Early collaboration offers a solid

Early collaboration offers a solid, risk free, customized design



On time, on budget are key to the bottom line



#### **Technical Serivces Obligation**

When all others have moved on, Ovivo's services endure



# THE **SiC** DIFFERENCE

WIDE OPERATIONAL WINDOWS • EXTENDED MEMBRANE LIFE

#### **OPERATING LIMITS/CAPABILITIES**

Operating Parameter	Units	Silicon Carbide	
TSS	mg/l	< 45, 000	
Oil & Grease	mg/l	< 500	
Free Oil	mg/l	< 500	
рН	-	1 - 14	
Temperature	°C	1 - 80	
Backwash Pressure	psi	< 30	
Chlorine Tolerance	ppm hours	5,000,000	



MEMBRANE TECHNOLOGY CONVERSION

SIC REPLACES POLYMERIC



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DEC

PE

**HOLLOW-FIBER** 

FLAT PLATE

1A9

**FLAT SHEET** 

PS

**HOLLOW-SHEET** 

**FIBER-PLATE** 

PTFE

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1-855-GO-OVIVO

info@ovivowater.com ovivowater.com



# ACHIEVING A NEW LEVEL OF PERFORMANCE IN MEMBRANE TECHNOLOGY

Highest Flux

Withstands the Harshest Environments

Quick & Easy Cleaning for Full Recovery

Longest Life of Any Membrane

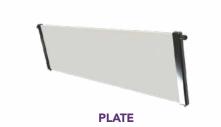
Ideally suited for
Sludge Thickening,
High Rate MBR, Tertiary
Treatment and Wet Weather
Overflow Applications

# SILICON CARBIDE FLAT PLATE MEMBRANES

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# **KEY HIGHLIGHTS**

- 0.1 µm pore size
- Completely hydrophilic
- High chemical and temperature tolerance
- Submerged design
- Resistant to damage from debris, grit, and coarse material
- Easily re-wetted after drying



#### WHAT'S SO SPECIAL ABOUT SILICON CARBIDE?

Silicon Carbide's natural properties effortlessly attracts water while repelling foulants. This results in extremely high sustainable fluxes and the ability to operate reliably in high solids and oils, as well as under other difficult conditions that polymeric membranes have shied away from. Silicon carbide is also one of the hardest materials in the world and forms membrane plates that are solid as a brick and able to withstand the broadest range of temperature, pH, chemicals, and pressures. SiC membranes have achieved a new level of performance in some of the most demanding applications.



# **HOW IT'S MADE**



**SIC POWDER** 

Silicon Carbide mixed into paste and extruded



**SUBSTRATE** 

Extrusion fired at 2,000 °C to bind SiC grains



**MEMBRANE LAYER** 

Membrane layer applied to substrate



SIC PLATE

0.1 micron SiC flat plate membrane



**STACK** 

# **POTENTIAL APPLICATIONS**

capacity within the same footprint











# THE **OVIVO** DIFFERENCE

200+ YEARS OF HERITAGE • 100% FOCUSED ON WATER

#### **OPERATING LIMITS/CAPABILITIES**

Operating Parameter	Units	Silicon Carbide	
TSS	mg/l	< 45, 000	
Oil & Grease	mg/l	< 500	
Free Oil	mg/l	< 500	
рН	-	1 - 14	
Temperature	°C	1 - 80	
Backwash Pressure	psi	< 30	
Chlorine Tolerance	wt%	1.0	



**CSO Results** (Raw Sewage)



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Ovivo® Silicon Carbide Membrane Technology





It is our responsibility to treat, recover, and reuse it wisely.

Ovivo's mission is to provide sustainable and efficient water treatment solutions to our customers through expertise and innovation.



Silicon Carbide (SiC) represents a dramatic shift in membrane technology. With a unique, set of material properties, SiC changes the perception of what a membrane is capable of doing.

SiC naturally draws water in while polymeric membranes have the tendency to repel water. Such a high affinity for water allows SiC to repel the most aggressive substances and materials, resulting in the highest sustainable flux rates.

SiC membranes allow water and wastewater treatment plants to achieve levels of performance previously thought impossible.





All of SiC's key properties work together to provide a technology that is 100% recoverable.



# **HYDROPHILIC**

Natural and permanent hydrophilic properties ensure less chemical cleaning and indefinite dry storage.



# **POROSITY**

Operate at higher sustainable flux rates and solids concentration compared to other membrane formats.



## MATERIAL STRENGTH

Both extremely hard and chemically inert material, SiC allows for aggressive cleaning methods.

# PRODUCT OFFERING

SiC's versatility – namely, it's wide operating window, ability to be dried and rewetted, and high chemical tolerance – provides a sophisticated operating experience with 100% sustained recoverability over the life of the membrane.

SiC membrane technology is the best available technology for membrane bioreactors (MBR), sludge thickening applications, wet weather treatment, and tertiary treatment systems.

	MBR	WET WEATHER TREATMENT	TERTIARY TREATMENT	SLUDGE THICKENING
PACKAGED PLANT OFFERING	•	•	•	•
CONVENTIONAL PLANT UPGRADES	•	•	•	•
REUSE QUALITY EFFLUENT	•	•	•	•
CSO/SSO TREATMENT		•		
HIGH MLSS	•			•
NITROGEN REMOVAL	•			•
REDUCED SLUDGE HAULING AND SOLIDS DISPOSAL	•			•
TSS & TURBIDITY REMOVAL	•	•	•	•
PATHOGEN REMOVAL	•	•	•	•
ULTRA-LOW PHOSPHORUS REMOVAL	•		•	
SMALL FOOTPRINT	•	•	•	•
REMOTE MONITORING CAPABILITIES	•	•	•	•

# **MBR SYSTEMS**

Revolutionizing MBR systems with unmatched performance, easier operation, and reuse quality effluent.



#### **PRODUCTS**

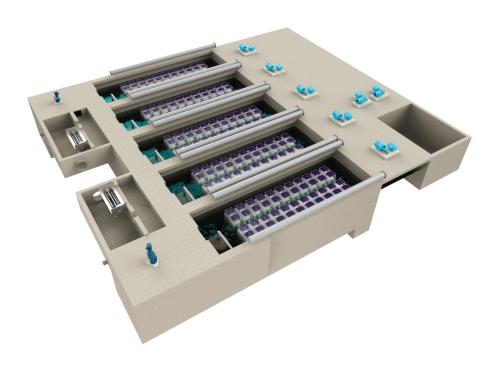
- Ovivo® MBR System
- microBLOX® Package Plant

#### **ADVANTAGES**

- Wide operational window allows systems to perform well under a broad range of harsh conditions.
- Extended membrane life: Durable, resistance to fatigue and chemicals, which sets up a long sustainable lifespan

# WET WEATHER TREATMENT

Prevent pollutants being discharge into sensitive waterways with rapid treatment of CSO and SSO flows.



#### **PRODUCTS**

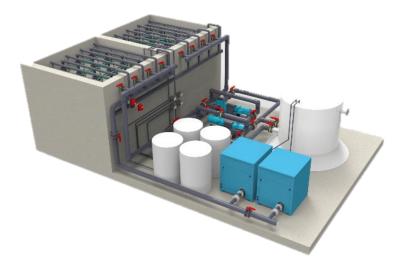
- Ovivo® RapidStorm™ Treatment
- ullet stormBLOX $^{\text{TM}}$  Package Plant

#### **ADVANTAGES**

- Rapid treatment with instant high quality effluent
- Ground-breaking disinfection advantages with 6 Log fecal coliform removal
- Ideal for tight footprints

# TERTIARY MEMBRANE FILTRATION

Advanced treatment to meet tight permit limits and for water reuse applications with completely new disinfection capabilities.



#### **PRODUCTS**

- Ovivo® Tertiary Treatment System
- ultraBLOX™ Package Plant

#### **ADVANTAGES**

- Ultra-low phosphorus removal
- Reuse
- Retrofit existing chlorine contact chambers

# SLUDGE THICKENING SYSTEMS

Reduce hauling costs and polymer usage in a smaller footprint.



#### **PRODUCT**

• solidBLOX™ Package Plant

#### **ADVANTAGES**

- Easy to install & quick start-up
- Can thicken WAS up to 3% solids without polymers
- Reliable performance & reduced O & M



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