



Water & Wastewater Treatment

Company Overview

Industries & Services

Some Industries We Serve

- Oil & Gas, Petrochem, & Refineries
- Food & Beverage
- Municipalities
- Mining
- Primary Metals
- Plastics
- Pulp & Paper
- Automotive & Aerospace
- Chemicals & Specialty Chemicals

What We Provide

- Packaged Treatment Systems
- Engineering & Design
- Custom Fabrication
- Lab Treatability & Water Analysis
- Installation - Start-Up - Training
- System Operation & Operators
- Field Services & Technical Support
- System Rentals
- Project Management

Experience & Strength

- Orion designs, fabricates, and integrates water and wastewater treatment solutions for all industries and municipalities.
- One-Stop Solution Provider: Orion has a vast dedicated team of experienced operators in addition to our design, fabrication, and integration offerings.
- Orion has treated over 30 Billion gallons of wastewater to date.
- Over 200 years of combined experience in water & wastewater treatment, oil and water separation, waste management and minimization, and re-use applications.
- Technical support includes Mechanical, Electrical, Chemical and Environmental engineers, Process Engineering, Mechanical designers, Chemist, and Biologist.
- Field Support team of supervisors, operators, mechanics, and safety personnel.

Some Trusting Customers



Southwest Shipyard



Some Treatment Offerings

- **Pre-Treatment**

- Lift Stations
- Screening
- All Tank Systems (EQ, Storage, etc.)



- **Primary Treatment**

- Coagulation & Flocculation
- Oil Water Separators
- DAF Systems / Clarifiers / Evaporators
- Dewatering Systems (Screw and Filter Presses)



DAF



OWS

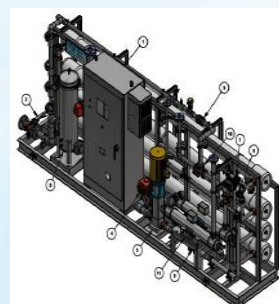
- **Secondary Treatment**

- MBR/MBBR/CAS Systems
- BNR Activated Sludge Treatment
- Bio-Augmentation & Nutrients dosing



- **Tertiary & Other Treatment**

- Packaged UF/RO systems
- Ozone Disinfection
- Odor Control
- Ammonia/TN reduction by Ozone



Dissolved Air Flotation (DAF)

Orion DAF system designs offer the most efficient and effective performance for removing total suspended solids (TSS), fats, oils, greases (FOG), phosphorous, and biological oxygen demand (BOD), with models ranging from 5 GPM to over 3,000 GPM in a single DAF system.

We offer a micro-footprint plate pack DAF design to help with space limitations or to simply optimize your real estate. For significantly high TSS loadings we also offer an open-top design for high and low flowrates.



World Class Fabrication
Innovative Designs
Custom Build To Spec



Inclined Plate Pack
Micro Design

Note: We offer an open tank design for very high TSS loadings.



Operating Client
System

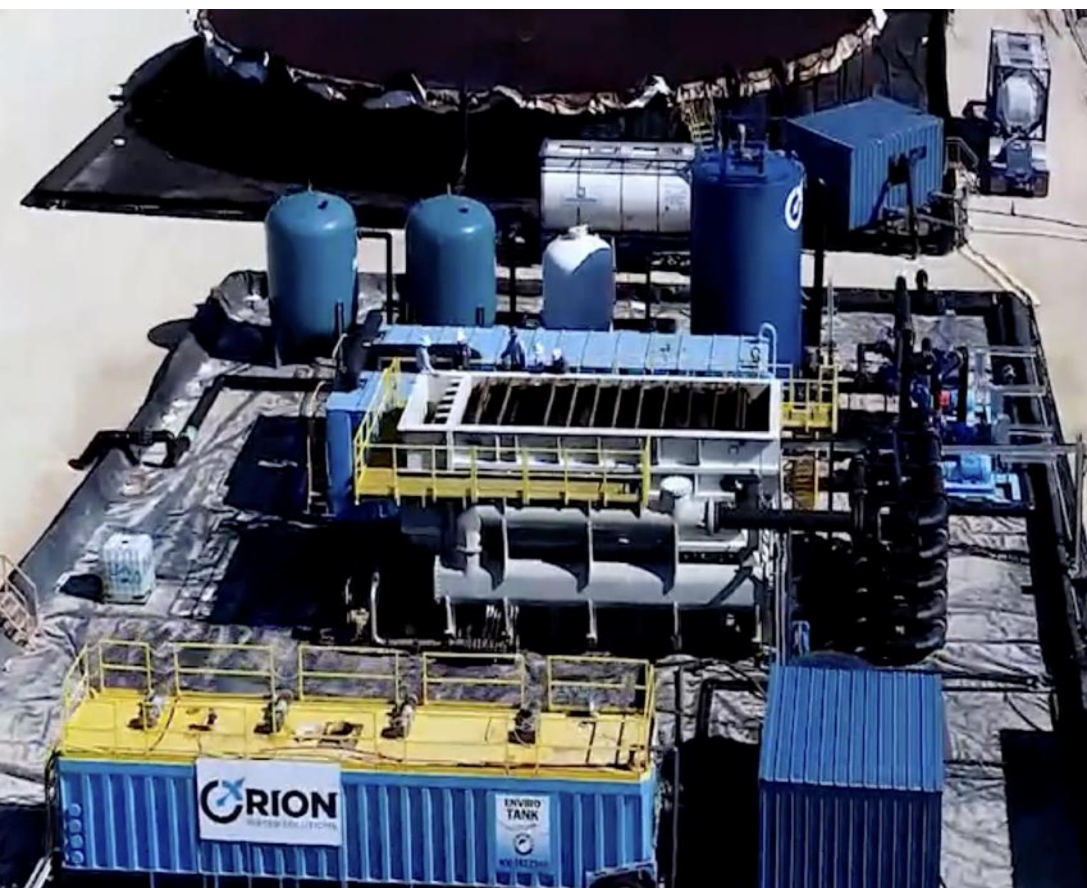


Open tank Super Micro
Footprint Design

- Small Flow Rates 5-70 GPM
- Remove Settled and Floating Solids
- Affordable for Small Budgets

DAF Processed Water (PW) Recycling

As an in the field service offering, Orion operates mobile and fixed recycling systems across several shale plays in North America. We own and operate a fleet of dissolved air flotation (DAF) systems, including the largest one in the Permian Basin with a capacity of 200,000 barrels per day.



8 MGD Capacity

Untreated Influent
Ra100-150 mg/L of FE &
500 to 1500 mg/L of TSS



Treated Effluent
<2 mg/L of FE
<5 NTU Turbidity

Clarifiers

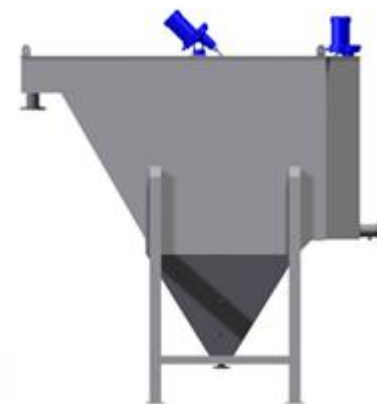
Metal finishers requiring high-efficiency solids removal from metal hydroxide wastes are turning away from the traditional large circular or rectangular clarifiers to our Inclined Plate Clarifiers.

Clarifiers are:

- Up to 50% lower installed cost
- Up to 90% less floor space requirements
- Built-in sludge thickening
- Completely automated operation
- No moving parts

Available in six standard sizes, our Inclined Plate Clarifiers handle flow rates of 30 to 360 gpm. We also custom design and build these clarifiers to serve non-standard requirements.

- Carbon Steel (epoxy coated)
- Stainless Steel (304L or 316L)



Evaporators

ORION SUBMERGED COMBUSTION EVAPORATORS ADVANTAGES

Submerged combustion is one of the most economical and innovative evaporation methods for on-site evaporation for a large variety of different industrial wastewaters applications. It is a viable alternative to the high disposal cost of wastewater with specialized waste management companies or other processing methods. You must also consider the high risk of having wastewater hauled by others over road, rail, or other means to a disposal site being a huge liability.

FEATURES & BENEFITS

- Efficiency rating of 97% in most cases.
- Submerged combustion is combustion of gas in a manner that hot combustion gases are released under the surface of a liquid. Energy is released by the combustion process and transferred by direct contact with the liquid.
- The burner produces hot gases contacting the liquid creating almost instant vapor while combustion gasses rapidly mix the liquid for even heat distribution. Extensive testing proves submerged combustion saves approximately 25% in energy cost over serpentine tubes, hot plates, etc.
- Evaporation occurs at a lower liquid temperature averaging 185-F.



Example Model OE-1500 FRP
36,000 GPD / 857 BBL's/Day



Example Model OE-750 FRP
18,000 GPD / 428 BBL's/Day

Dewatering Solutions

Orion offers complete Dewatering systems for various sludge applications using Centrifuge, Screw Press, and Filter Press. We understand the application and design to achieve Optimum performance combined with easy operation and maintenance.

Centrifuge



Screw Press



Filter Press



Sludge flow and Solids loading

	Flow (GPM)	Solids (Kg DS/hr.)
Min	5 GPM	10
Max	200 GPM	500

NOVA MBR

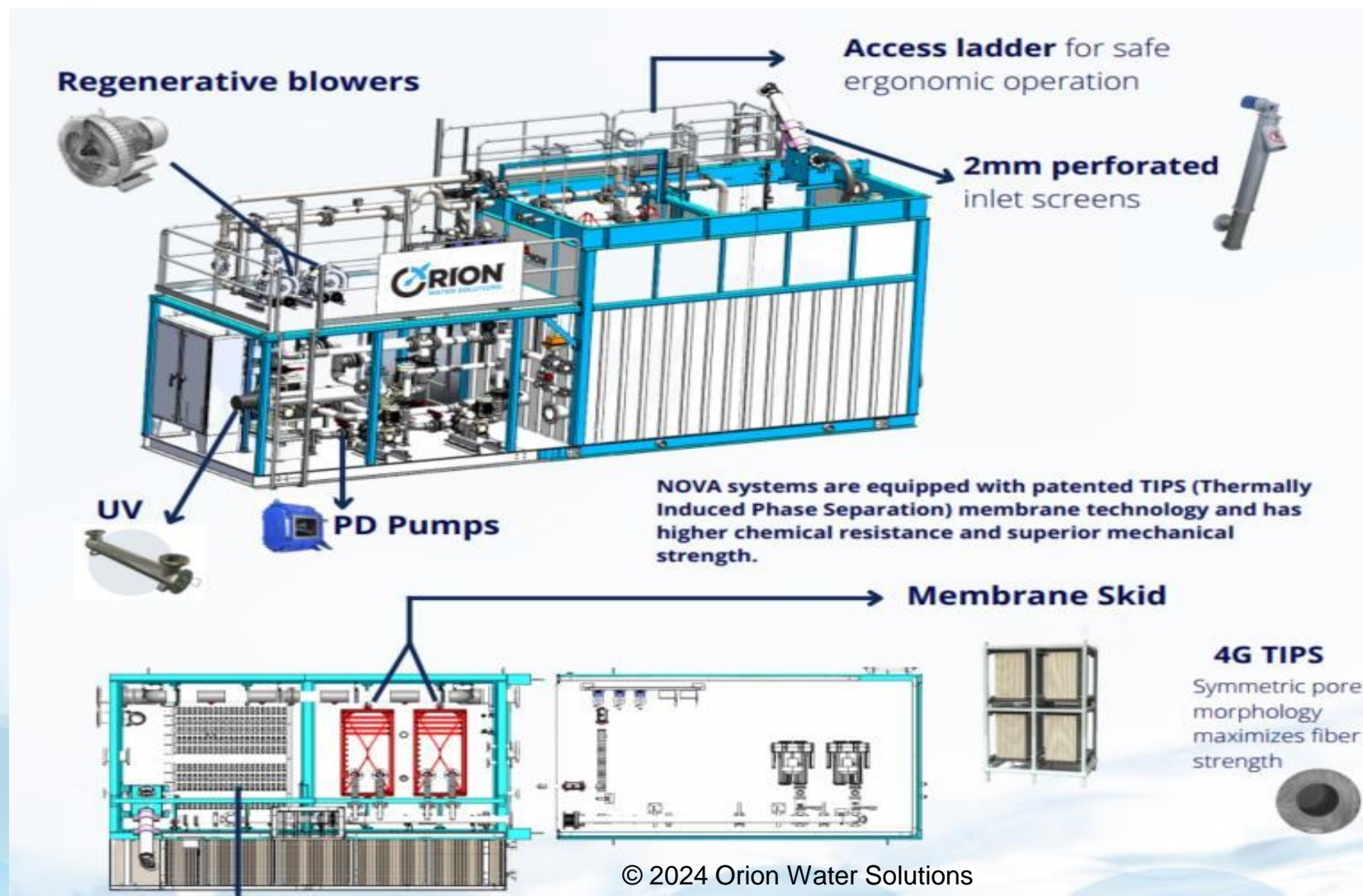
Super-Nova houses higher membrane surface area within the same foot print of NOVA for higher hydraulic capacity MBR applications.



Description	Flow (GPD)	Dimensions
Nova Small (NS)	30,000	30'L X 8.5'W X 12'H
Nova Large (NL)	100,000	50'L X 8.5'W X 12'H
Nova Extra Large (NXL)	250,000	30'L X 8.5'W X 12'H

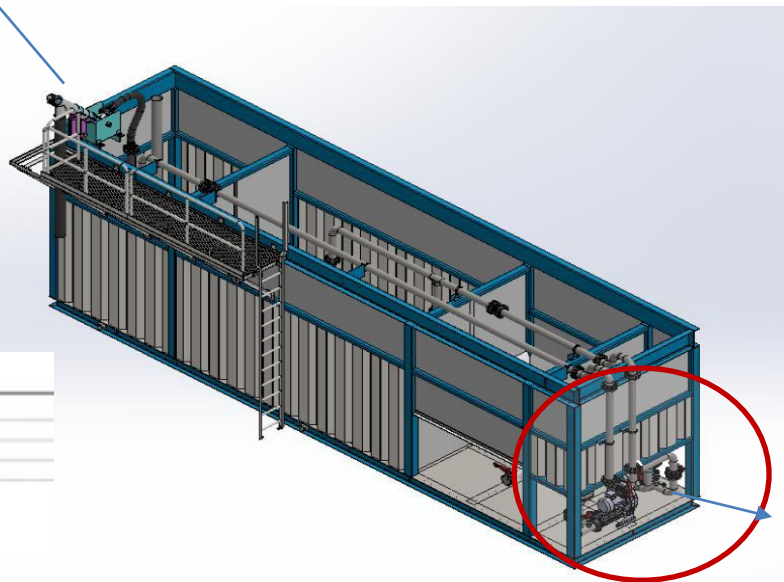
NOVA MBR

NOVA submerged MBR is a biological system with TIPS Membrane technology that discharge high-quality effluent suitable for compliance, regulations, and water reuse, one of its kind in the global market.



Packaged MBBR System

Inlet Screens

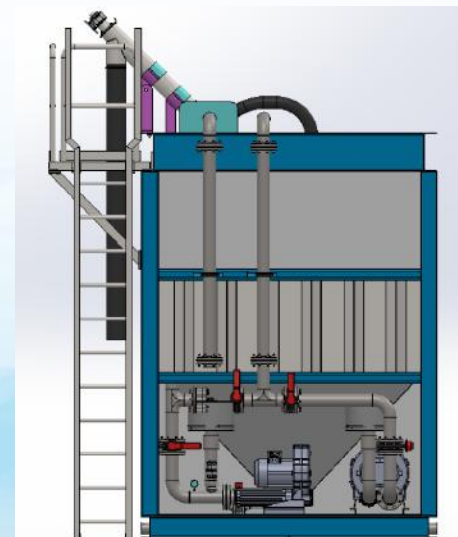


- Bio-Chip Media 4-to-6 times larger surface area compared to other Manufacturers in the market.
- Compact design with easy access to equipment and valves.
- 90-95% BOD/Ammonia reduction.
- Tertiary filtration and Disinfection on a separate skid as an option.

Blower Arrangement

Model: Biochip

Spec. : $\Phi 30 \times 1.1$ mm
 Surface area : $> 5500 \text{ m}^2/\text{m}^3$
 Material : HDPE
 Life span : > 15 years

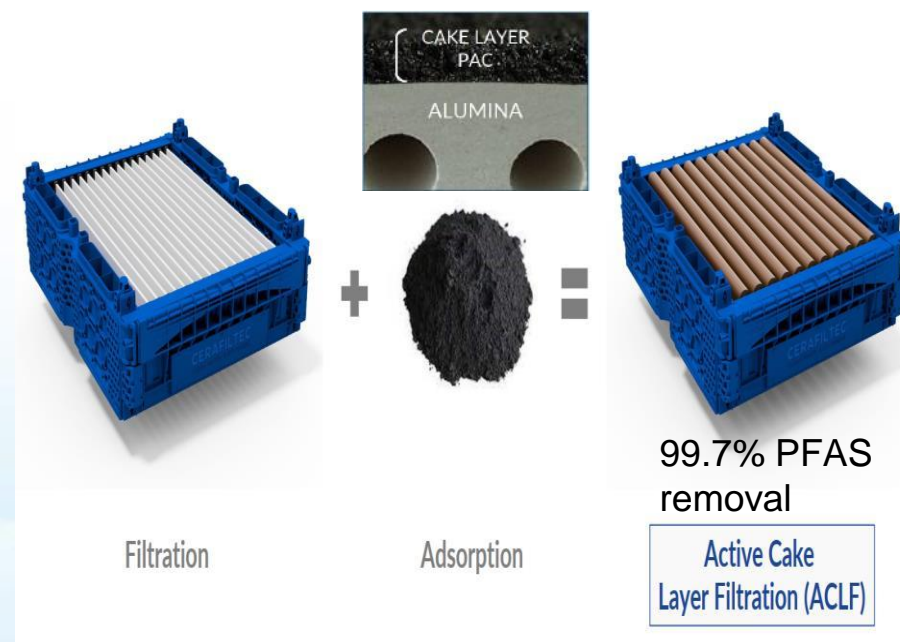


PFAS & Dissolved Organics Removal

PFAS and Dissolved organic compounds such as ethanol, methanol, toluene, naphthalene, and other water-soluble organics can be effectively removed from wastewater using **ACLF-PAC** and **GAC** solutions by Orion.

1. Active Cake Layer Filtration (**ACLF**) using Powdered Activated Carbon (PAC) technology.
2. Granular Activated Carbon (**GAC**) units.

Sized to the wastewater content and volume, Orion offers modular systems for easy future expansions.



Custom Fabrication



Food Processing

Orion provides water treatment and waste minimization solutions (systems and or services) for many of the leading food processing plants throughout the USA.

- ✓ Fat, oil, and grease (FOG) separation, treatment, and disposal.
- ✓ pH control.
- ✓ Removal of TSS, BOD, and other contaminants.
- ✓ Dewatering systems and or services.
- ✓ Sludge minimization and disposal.
- ✓ Analysis, repair, and supply of bio-reactors and digesters.
- ✓ Complete WWTP's, new implementations, equipment replacement, and retrofits.
- ✓ WWT for Disposal and Reuse applications.



Upstream Oil & Gas



Orion operates mobile and fixed recycling systems across several shale plays in North America. We own and operate a fleet of dissolved air floatation (DAF) systems, including the largest one in the Permian Basin with a capacity of 190,000 barrels per day.



Orion provides on-the-fly treatment for bacteria control, scale prevention, and fluid conditioning in support of pressure pumping operations for many of the leading operators.

Refinery & Petrochemical

Orion provides water treatment and waste minimization services during plant turn-arounds and upgrades.

Our services include:

- Sludge minimization and disposal
- Pond cleaning and dredging
- Carbon and media bed filtration
- DAF rentals
- Boiler and cooling tower cleaning and treatment
- Digester and basin cleaning



Industrial Water Treatment & Disposal



Orion operates an industrial water treatment facility in partnership with Phoenix Enterprises in Port Arthur, Texas.

Providing the following services:

- Barge and tug bilge water treatment and disposal
- Oil, fuel, and grease separation, recovery, and disposal
- Hazardous fluid treatment and disposal
- Solids dewatering
- Tank and vessel cleaning
- Laboratory analysis of contaminated fluids

Disinfection Systems

Orion offers skid mounted/mobile disinfection systems for water and wastewater treatment. Disinfection systems are designed, manufactured, and tested for maximum performance and longevity.

Offerings:

1. Onsite Ozone Generator System – Fully automatic with ozone destruct and contact tank, SS built.
2. Onsite Chlorine Dioxide System – Mobile systems for Drinking Water and Wastewater applications.
3. Skid Mounted UV System – Title 22 & NWRI certified, fully automatic plug and play system, SS built.

Ozone System



Ozone Removes Odor/Color and is FDA approved.

ClO2 System



Reuse & Safe Recycling Applications

Activated sludge processes combined with filtration/disinfection treatment technologies are used to help treat wastewater for Reuse or Safe disposal. We offer packaged systems ranging from 5K to 250K GPD.

