

ENGINEERING TECHNICAL BRIEF

Bio-Disk®

Fixed-Film RBC Platform

With increased federal And state funding, project evaluation is driven by lifecycle cost, reliability, and operational simplicity — not only PACKAGE PLANT performance.

Calable UP TO 200,000 GPD.



Technology Overview

Bio-Disk® is a fixed-film Rotating Biological Contactor (RBC) system featuring:

- Attached-growth biomass
- Passive aeration (no blowers)
- Stable performance under variable loads
- Low operator dependency
- Reduced mechanical complexity
- Modular system
- Plug and play installation

Application Fit Best suited for:

- ✓ Rural / decentralized systems
- ✓ Parks and public facilities
- ✓ Failing systems replacement
- ✓ Remote locations with limited staffing

Engineering Positioning

Effluent quality is a function of system design, hydraulic loading, and discharge requirements. The Bio-Disk® system can be engineered to meet stringent effluent standards, including: BOD, TSS, Nutrients, Disinfection targets.

Through:

- EQ and Pre treatment tanks
- Proper system sizing
- Multi-stage RBC configuration
- Integration of tertiary treatment such as:
 - Sand filtration (pressure or gravity)
 - UV/Chlorine disinfection
 - Additional polishing units as required

Automation, Monitoring & Control

- Remote monitoring (flow, motors, alarms)
- Cloud-based data logging
- Real-time alerts (SMS/email)
- Remote diagnostics and troubleshooting

Result:

- ✓ Reduced site visits
- ✓ Faster response time
- ✓ Reduced routine operator dependency

Parts Advantage

- No blowers
- Fewer moving parts
- Lower wear rate
- Reduced replacement frequency

✓ Significantly lower spare parts cost over lifecycle

O&M Comparison

Category	Bio-Disk®	Extended Aeration
Energy	Low	High
Operator time	Low	High
Sludge handling	Low	Moderate-High
Maintenance	Simple	Complex
Spare parts	Low cost	Higher cost

↓ Estimated O&M reduction: 40-60%

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Funding & Compliance

- ✓ Suitable for SRF / USDA projects
- ✓ Supports lifecycle-based approvals
- ✓ Reduces compliance risk

EPC Support

01	02	03	04	05
Engineering design	Installation supervision	Commissioning	Operator training	Ongoing support

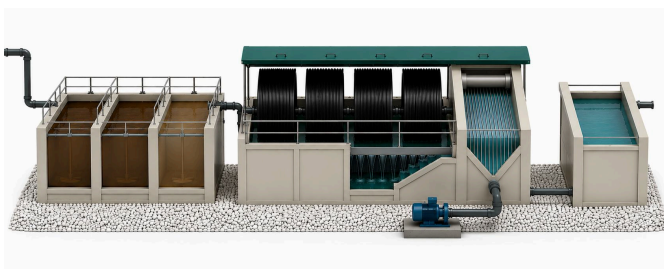
Performance Results

Field data from the Tygart Lake State Park project, WV

- Design Flow: 20,000 GPD
- Proven multi-year operation

Parameter	Typical Range	Average	NPDES Limit	Margin to Limit
BOD ₅	2.1-8 mg/L	3-5 mg/L	30 mg/L	83%
TSS	<4-12 mg/L	8 mg/L	30 mg/L	73%
Fecal Coliform	<1-50	>50	200-400	Low
DO	7-9 mg/L	~8 mg/L	≥6 mg/L	+33%
pH	6.9-8.1	7.5	6-9	In range
NH ₃	0.5-3 mg/L	1.2 mg/L	3 mg/L	60%

- ✓ The system consistently operates below permit limits under real operating conditions.



Operational Performance

ENERGY

\$3.21 Per day | **50-70%** Lower energy use*

- ✓ Typical reduction: 50-70% vs extended aeration

EXCESS SLUDGE

3,000 gallons Per year | **65-85%** Less sludge handling*

- ✓ Typical reduction: >80% vs activated sludge

OPERATOR

1-2 hours Per week | **60-80%** Reduced operator time*

- ✓ No continuous operator required
- ✓ Suitable for remote operation

*Bio-Disk® vs. conventional systems

Summary

Bio-Disk® provides:

Design flexibility to meet stringent discharge requirements

Stable effluent performance

Low operating cost

Reduced operator dependency

Simplified operation through automation