

Phosphorus Removal from Lagoons

Blue PRO[®] at Lagoons

The Blue PRO[®] lagoon phosphorus removal solution was developed specifically to handle the higher total suspended solids (TSS), algae, and total organic carbon (TOC) loadings typically found in lagoon systems.

Lagoons systems make up approximately 60% of the municipal WWTPs in the U.S. Increasingly, these plants are experiencing lowered phosphorus permit limits. The Blue PRO[®] solution is the cost-effective option for lagoon systems to reach their new permit limits. Low capital cost is combined with very attractive operating and maintenance expenses.

Higher efficiency removal

The Blue PRO[®] technology dynamically combines co-precipitation and adsorption of contaminants within a sand bed, creating higher efficiency removal than traditional chemical or biological processes can accomplish.

Blue PRO[®] process components include Centra-flo[™] moving bed filters, which carry acceptance for Class A reuse applications in California and Idaho. There is no need for backwashing or changing the media in the moving bed filters. The modular equipment allows for flexibility in handling a range of flow rates and future flow increases.

For a higher permit limit, such as 0.5 mg/L P, only a single pass system may be needed. Lower limits may be met with a two pass system.

Advantages of Blue PRO[®] over other technologies:

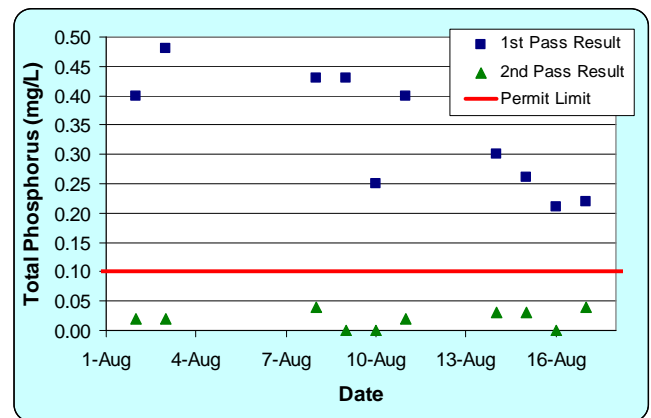
- Low capital and O&M costs
- Continuous flow – no interruption for backwash or changing media
- Modular design easily handles capacity increases
- Simple operation, low chemical use, and no pH adjustment



Lagoon Wastewater System

The Blue PRO[®] process has been tested at many lagoon systems around the U. S. The Page Wastewater Treatment Plant (WWTP), located near Kellogg, Idaho, consists of a lagoon treatment system followed by a chlorine contact chamber. Page WWTP may have to reduce phosphorus (P) in its effluent to avoid excess nutrient loading to the Coeur d'Alene River and Lake Coeur d'Alene.

Blue Water's Blue PRO[®] technology was successfully demonstrated at the Page facility, lowering total phosphorus from 2.5 mg/L to 0.020 mg/L (see graph), meeting Page's estimated future permit limit of 0.100 mg/L P.



Phosphorus Removal Results from Blue PRO[®]

A Blue PRO[®] series system was used for the pilot project. The first filter pass was fed with a flow rate of 10 gpm from the plant's chlorine contact chamber. Iron was dosed at 11 mg/L Fe to the first pass and 8 mg/L Fe to the second pass.



For more information, please contact Blue Water:

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Blue Water for a Green World[®]



Modular Blue PRO[®] reactive filtration systems are available in the following models:

Blue NITE [®] Models	Flow Rate	Footprint
Skid systems	5-100 gpm	8' x 10' and up
CF-50 fiberglass	0.25 MGD	8' diameter
CF-50 concrete	0.25 MGD	7' x 7'
Quad concrete	1 MGD each	15' x 15'

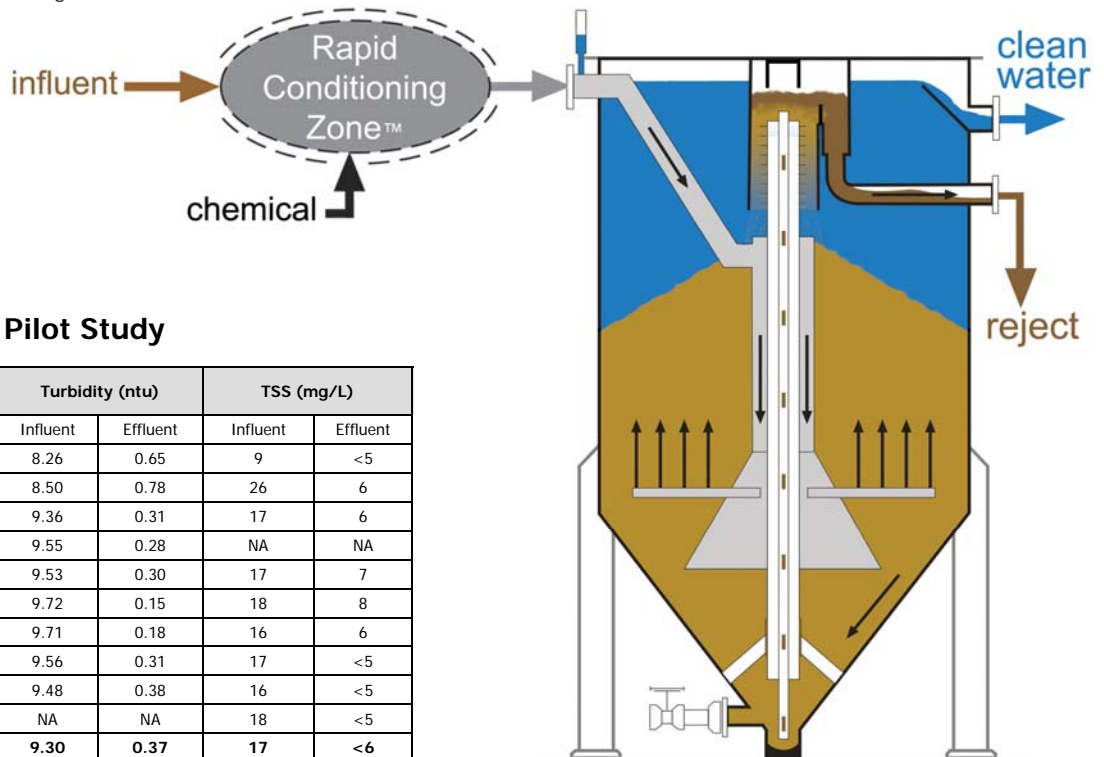


Featuring Centra-flo[™] continuous backwash sand filters.



Blue PRO[®]

Blue Water's Blue PRO[®] technology is covered by one or more patents and patents pending.



Results from a Lagoon Pilot Study

Date	Total Phosphorus (mg/L)		Turbidity (ntu)		TSS (mg/L)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent
August 2	2.46	0.020	8.26	0.65	9	<5
3	2.51	0.020	8.50	0.78	26	6
8	2.52	0.040	9.36	0.31	17	6
9	2.42	BDL	9.55	0.28	NA	NA
10	2.53	<0.010	9.53	0.30	17	7
11	2.61	0.020	9.72	0.15	18	8
14	2.70	0.030	9.71	0.18	16	6
15	2.65	0.030	9.56	0.31	17	<5
16	2.63	<0.010	9.48	0.38	16	<5
17	2.74	0.040	NA	NA	18	<5
Average	2.58	0.02	9.30	0.37	17	<6
St Dev	0.10	0.009	0.53	0.21	NA	NA

TSS = total suspended solids; BDL = below detection limit; St Dev = standard deviation; NA = not available

www.blueh2o.net
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Blue Water is proud to offer a broad platform of water treatment technologies, from primary wastewater treatment to advanced effluent polishing steps to environmental remediation processes. We strive to meet our customers' needs cost-effectively, considering both capital expense and ongoing operations and maintenance costs. Additionally, we keep an eye on the future by looking for sustainability in our technologies, including environmentally friendly materials and energy conservation.