



Blue Frog Patented Technology

By Absolute Aeration, LLC

Absolute Aeration, LLC

- Environmental Technology Firm based in Greeley, Colorado.
- Creators of the patented **Blue Frog Technology**.
- **Blue Frog Technology** is an affordable solution to treat wastewater revitalizing lagoon systems back to a healthy state.
 - Increasing the life of the lagoon system.
 - Designed to clean water to meet permitted discharge requirements.
 - Modular system designed to meet a client immediate project & financial scopes.



Blue Frog System Optimizes Lagoon Efficiencies

- Eliminates Sludge build-up.
 - Digests Organic Sludge in Situ.
 - Restores lagoon to the original design capacity.
- Clarifies Water to meet discharge parameters or water used for irrigation.
 - Reduces chemicals.
 - Lowers the surface tension and reduces pathogens.
 - Promotes environmental stewardship.



Technology Benefits for Municipalities

Clients Concerns	The Blue Frog Solution
High Cost associated with Dredge Estimated Cost: \$350 per dry ton	Increases anaerobic sludge digestion eliminating dredging (Bio Dredges in situ)
Lagoon downtime during dredge	Lagoon is in full operation during bio dredge
Reduced Retention Time	Restores lagoon to the original design capacity
Costly chemicals that are harmful to the environment	Reduces chemicals by utilizing natural indigenous organisms
Meeting stringent discharge requirements	Treats water to meeting permit requirements <ul style="list-style-type: none"> • Lowers BOD, TSS, Ammonia, & Pathogens
Odors complaints	System creates a 9" sweet cap preventing odors eruptions
Operator Certification	Minimal certification level required
Costly O & M	Significantly Lowers O & M Cost
Financial Risk	All systems supported with a performance based guarantee limiting

What is the Estimated Cost to Dredge?

- BFS eliminates any costs associated with removing organic solids
- Current cost to Dredge ~ \$350 per dry ton

GPD	Average Dredge Cost	
	Sludge level @ 25%	Sludge level @ 50%
300,000	\$262,710	\$525,420
600,000	\$525,420	>\$1mm
900,000	\$788,130	>\$1.5mm
1,000,000	\$875,700	>\$1.6mm

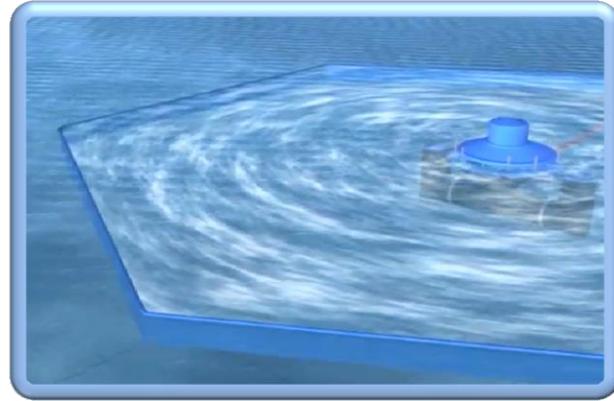
Calculation: $HRT(\text{example based on 30days}) * Flow(\text{gpd}) * Sludge Level(\%) * .25$ (est. Sludge level %*.08 (% of solids)*8.34/gal*341/2000lbs

Bio Dredging Utilizing Blue Frog System

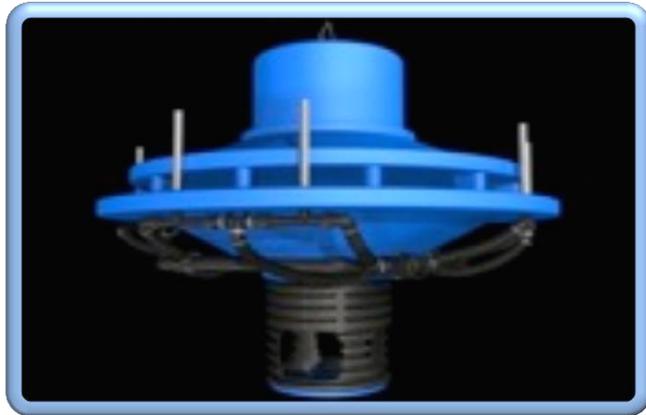
Blue Frog™



CSTR



Gold Frog™



Yellow Frog™



Absolute Aeration's Blue Frog System (BFS)

MIX- (clockwise) 7MGD

AERATE- (counter-clockwise) circulating ~2MGD

Chassis Composition: Low Density Polyethylene with UV protection:

Motors: 3 hp – manufactured by Nord

Output Shaft Speed : 144 Fiber (HD) or 208 Stainless Steel

Shaft Speed:144 RPM, 1,720 motor RPM / 12:1 gearbox reduction = 143.333

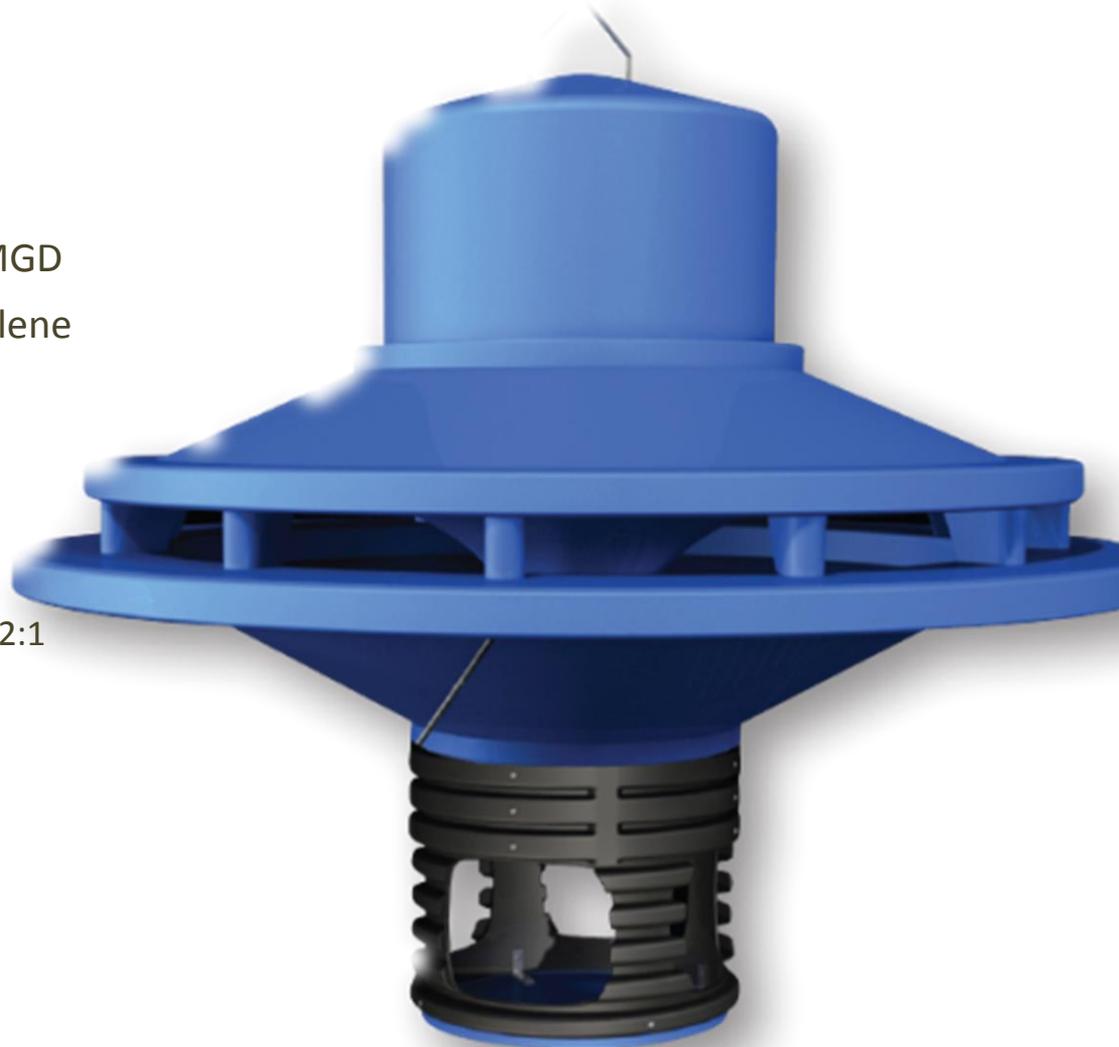
Dimensions

Total Weight: 520 lbs.

Diameter: 8 ft

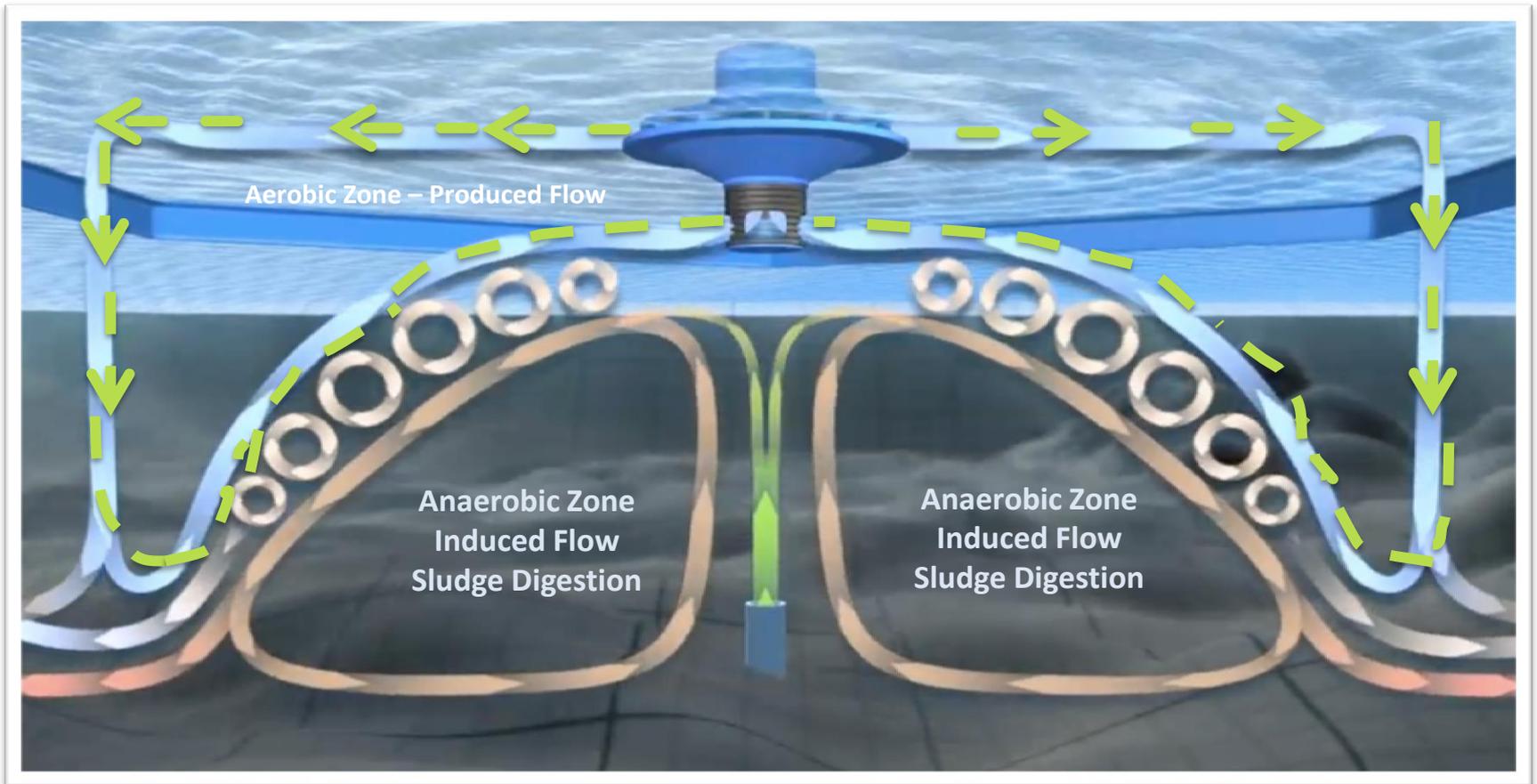
Total height: 5' 3"

Required Float Depth: 4 foot & up



Continuously Stirred Tank Reactor (CSTR)

- Engineered tank at the influent that selects for indigenous sludge digesting bacteria
- Treatment strategy sinks solids and digests sludge in the anaerobic zone.



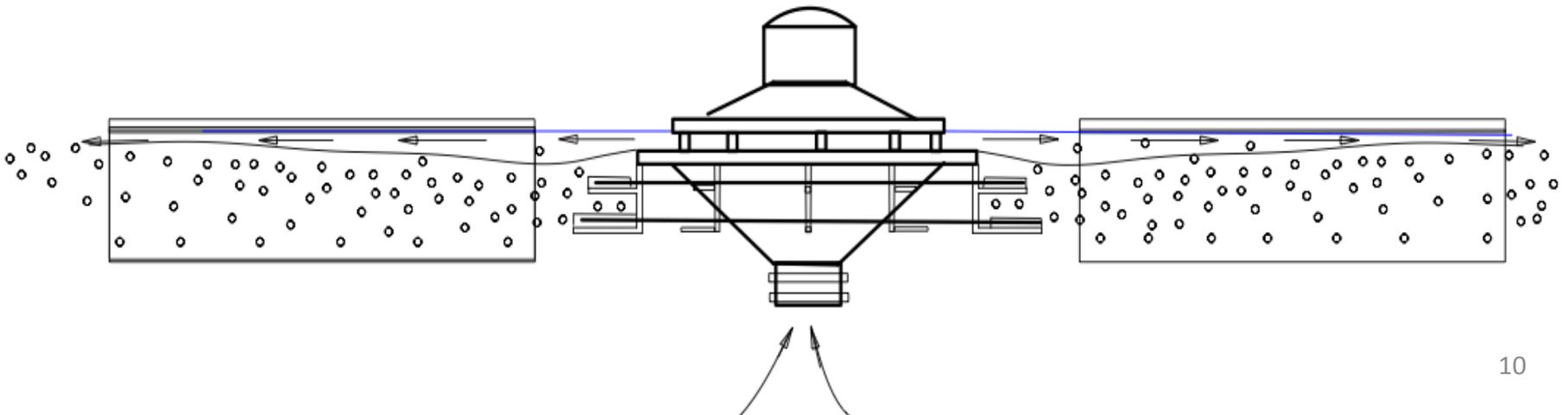
Continuously Stirred Tank Reactor (CSTR)

- An Engineered Floating-Boom is the Key to The Blue Frog™ System



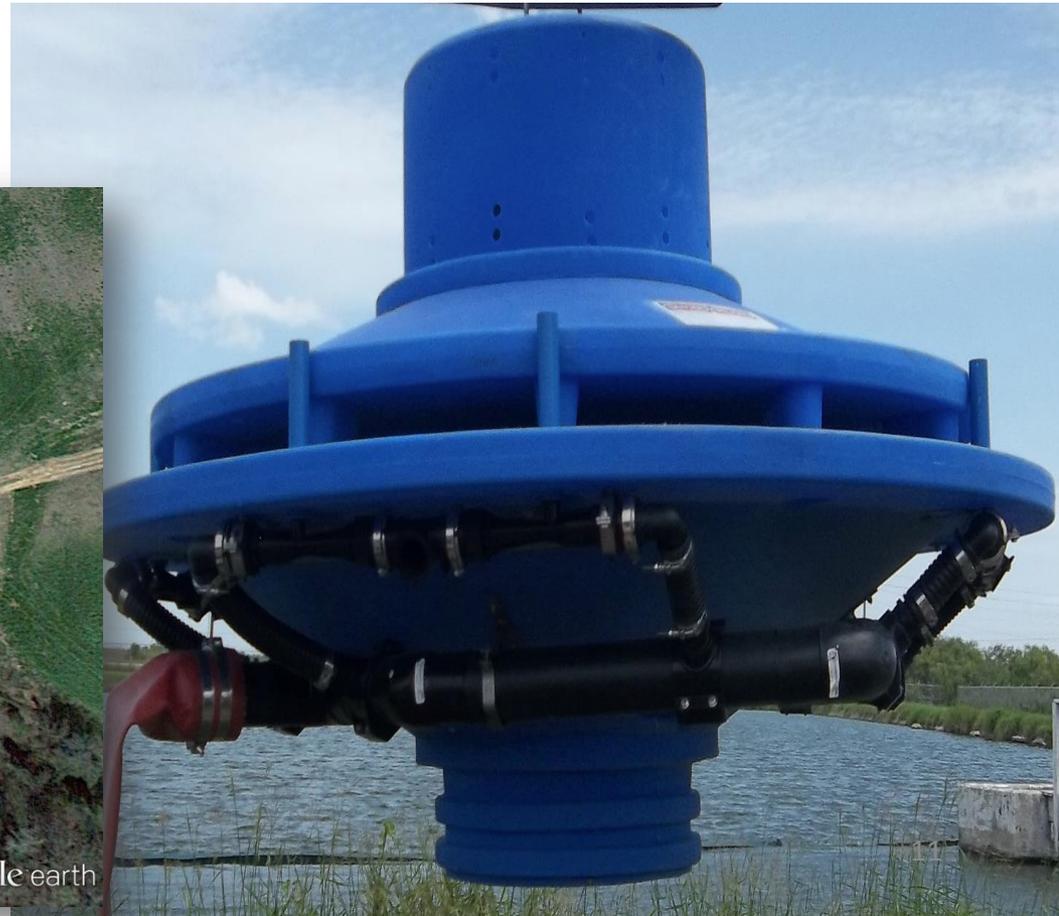
The Yellow Frog

- Utilized for Ammonia Reduction & Pre-Clarification



The Gold Frog™ - Exit Clarifier

- Rapidly oxidizes soluble BOD
- Lowers the specific gravity of surface water to .97
- Centrifugally separates solids at the base of the water column
- Digest sludge in situ



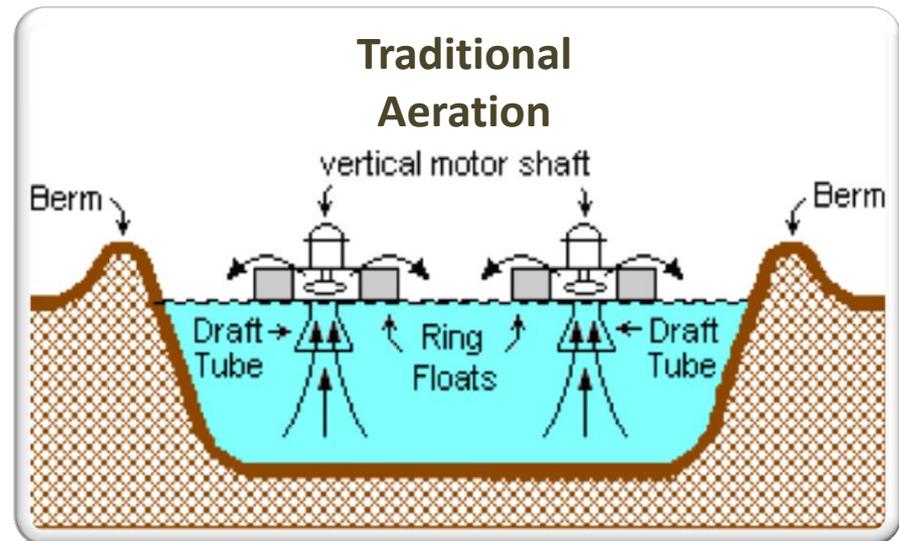
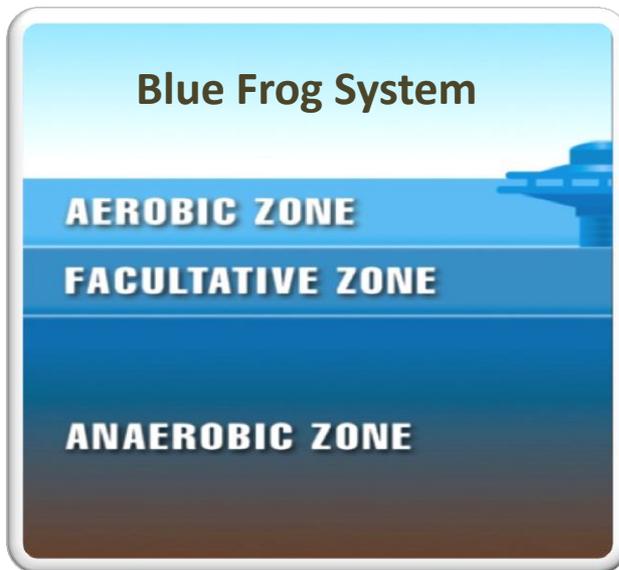
Clarification with Pathogen Control



The Distinctive Difference of A Blue Frog System

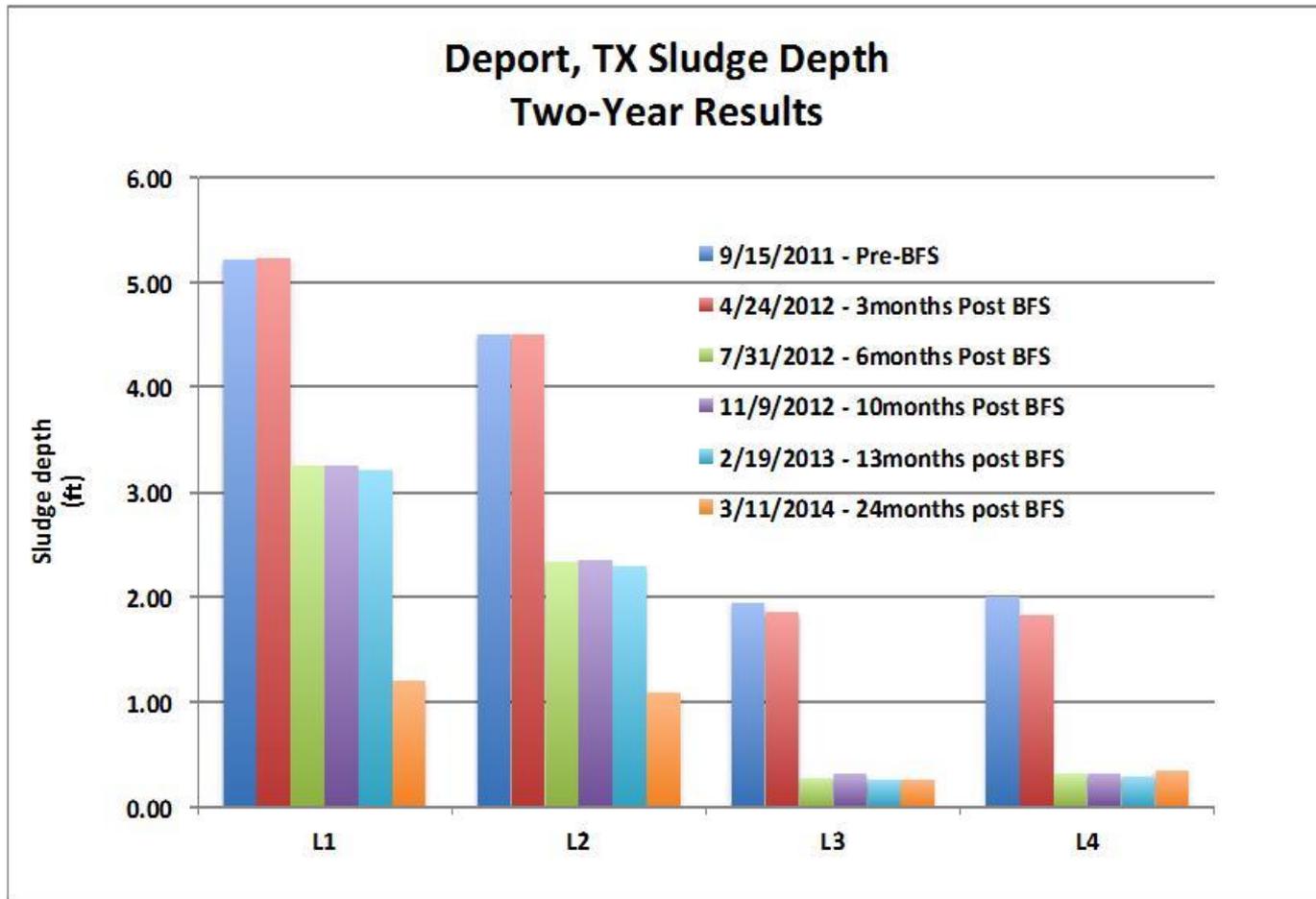
- ✓ Moves water horizontally; maintains the Natural layering
- ✓ Enhances the anaerobic breakdown process
- ✓ Digests sludge in situ
- ✓ Reduces O & M Cost
- ✓ Lower energy consumption

- ✓ Vertically Mix; breaks up the natural layering
- ✓ Solids rise to the surface
- ✓ Rains or sprays droplets
- ✓ Higher O & M Cost
- ✓ Increased energy consumption



Proven Documented Results

- Sludge was reduced 79% in two years
- During the bio dredge BOD, TSS, and E.coli were reduced to a new lower equilibrium.
- No odors during the bio dredge!



Municipal Water Quality Results – Deport, Texas

Picture taken at Installation Jan. 2012



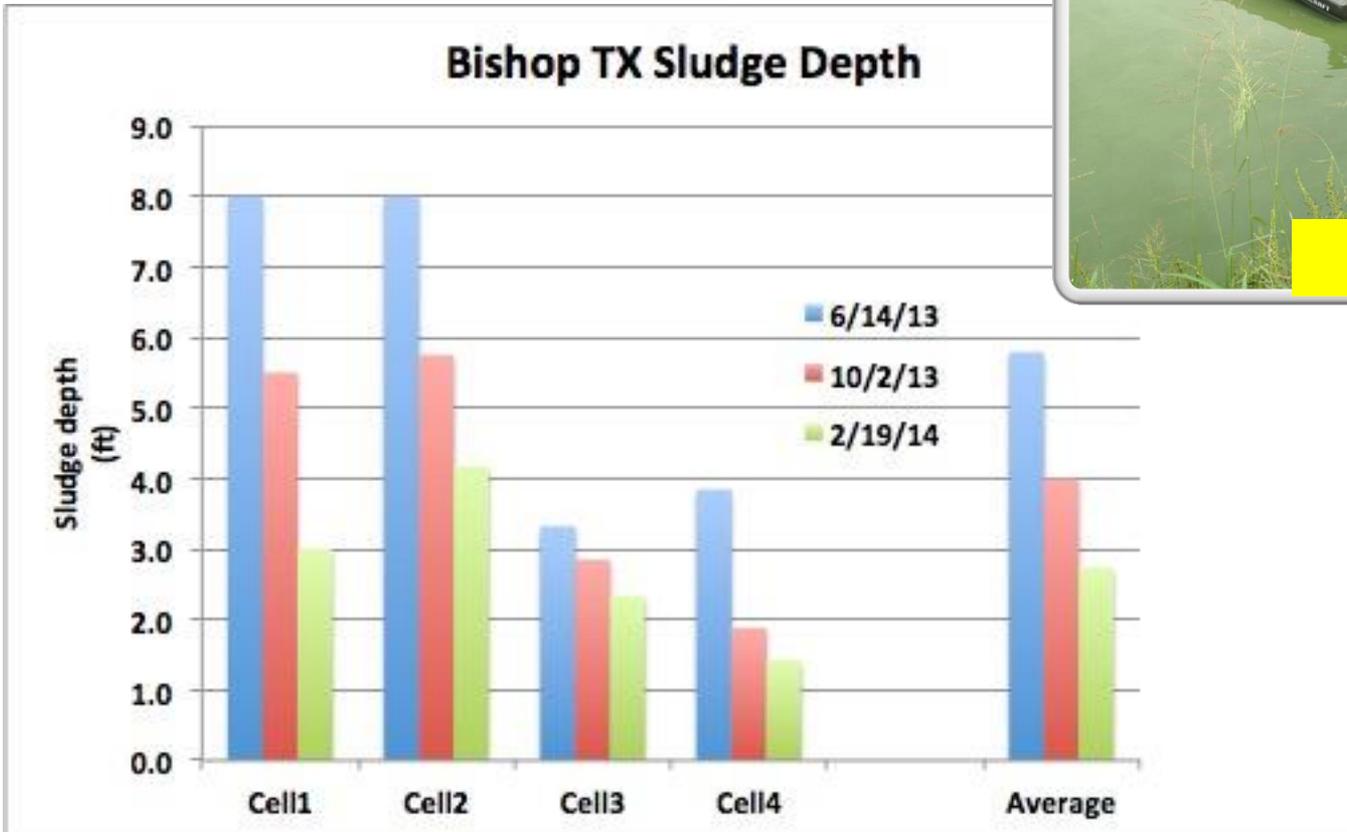
Picture Taken Jan. 2013



Immediate Results Bio Dredging

The City of Bishop, Texas

- Solids declined
 - 31% in 4 months
 - 53% in 8 months



Immediate Results Bio Dredging

The City of Bishop, Texas

Conditions At Installation



8 Months After Installation



Immediate Sludge Digestion Results

- **Location:** Luthi Farm, Western Oklahoma (*Contract farmer for Murphy Brown*)
- **Project Objective:** Digest Sludge
- **Results:** 14' Digested in first year



Immediate Sludge Digestion Results - CAFO

Before Installation

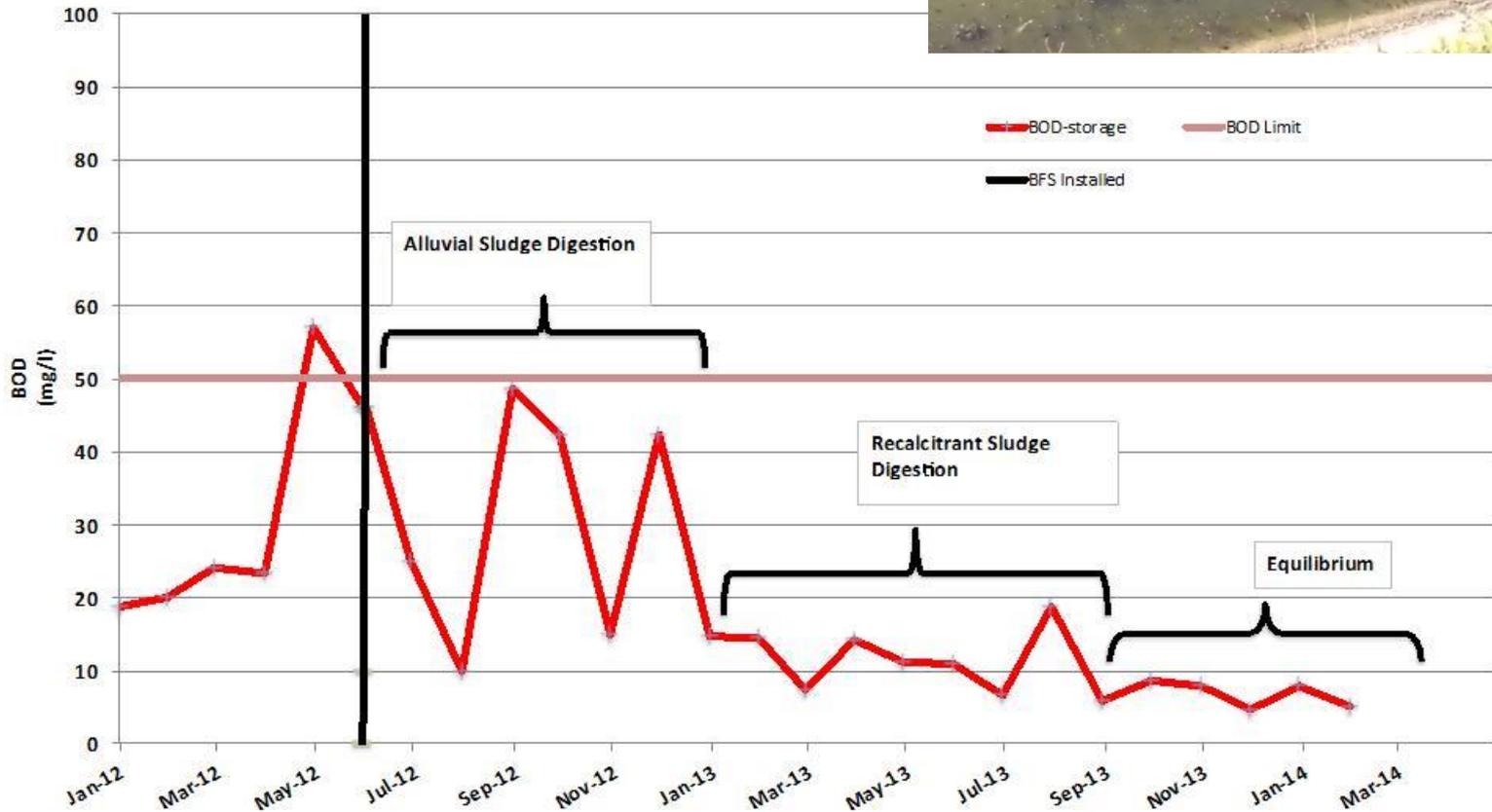


Results 21 Days Later

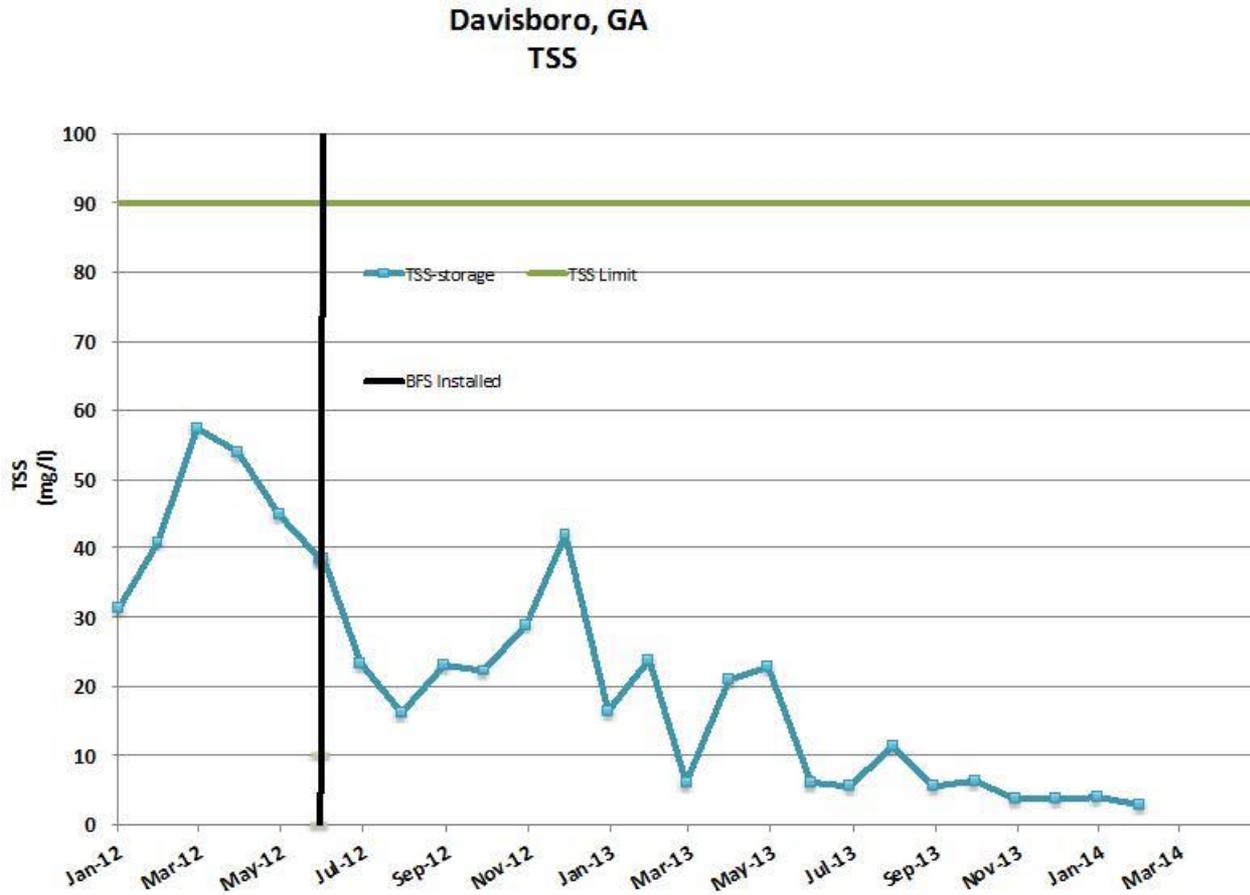


Multi-Year Municipal Results - BOD

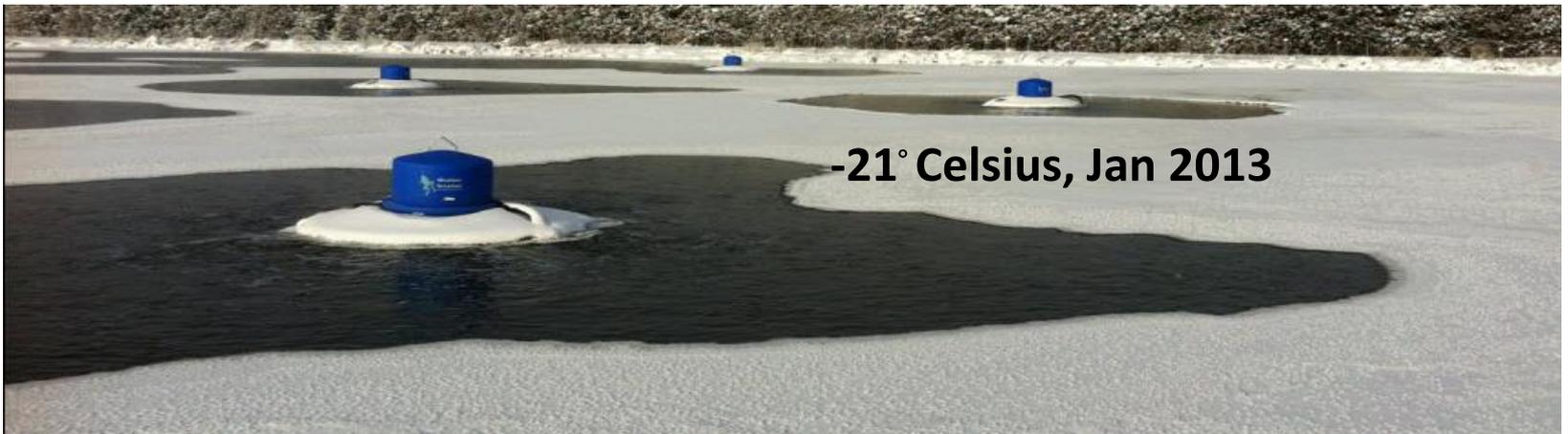
Davisboro, GA
BOD



Multi-Year Municipal Results - TSS



BFS Meets the Challenges During Cold Weather

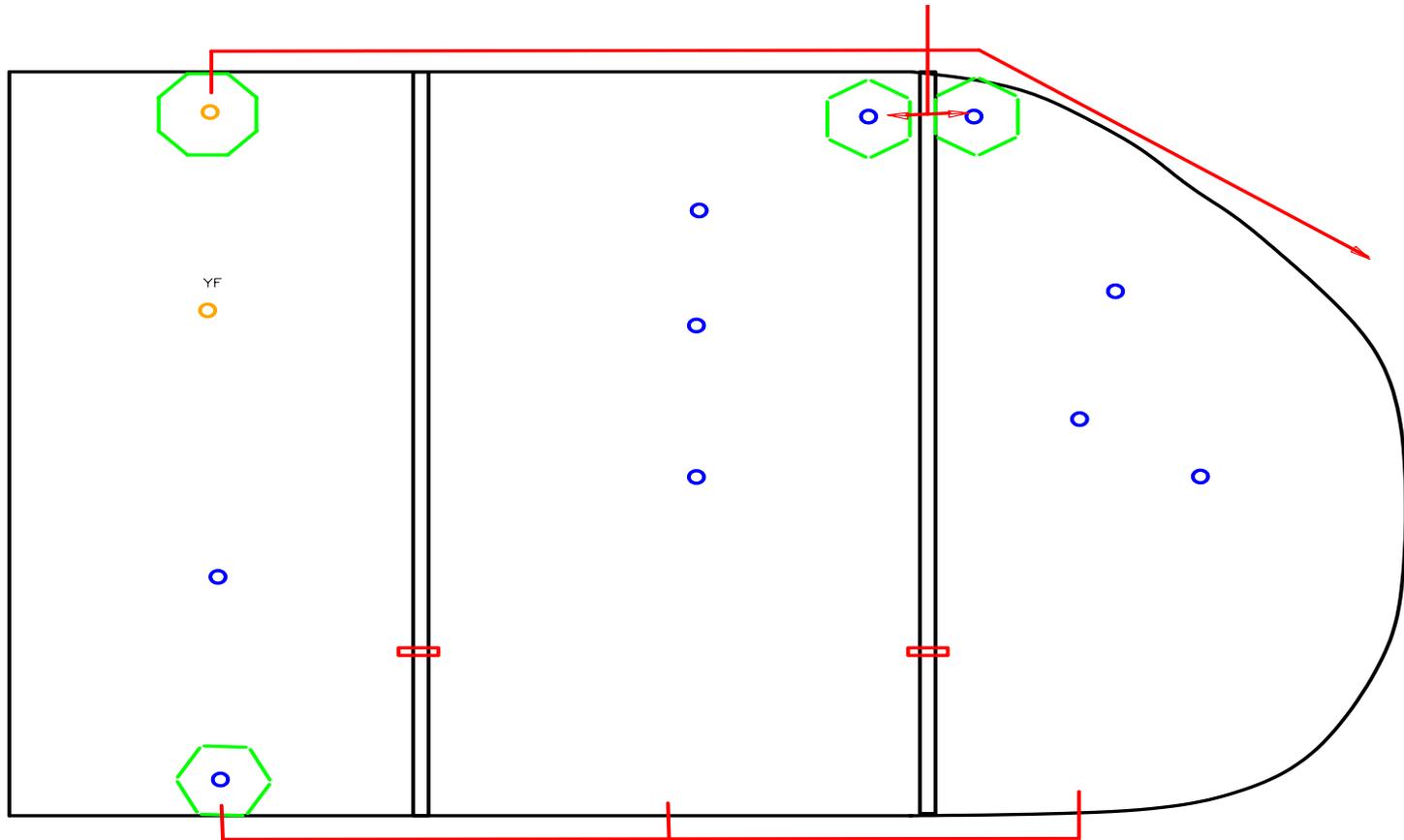


Blue Frog Design Strategy

- BFS is modular and can be designed to meet a client immediate project and financial scopes.
- The Following slides will show two examples of the modular strategies.
- The first design is for land application; the second design is for river release.

Example 1: Bio Dredge in Situ

- Eliminates cost & hassle of dredging.
 - Increases pond retention time
 - Digests old (ancient) sludge & new incoming sludge



Example 1: Equipment Summary

- All Circulators require an annual oil change
- Yellow Frog require a semi-annual air filter change on the blower.
- Gold Frog Pumps require an annual grease cartridge change.

Number of units	Unit	Total HP	Annual Maintenance Cost
10	Blue Frogs	30	\$250
1	Gold Frog	13	\$117
1	Yellow Frog	4.25	\$81
13	Total	47.25	\$448

Installation Requirements by the Client



- 2-4 People available
- Electrical completed
- Off-load and placement equipment
- Sludge measurements & Mapping completed at installation



Anchoring



Available Project Discounts

Clients interested in participating in a 24-month pilot project

- Monthly DMR's shared with Absolute Aeration.
- AA has the right to use client information in published case studies, white papers, and editorials.
- AA has the right to hire 3rd party lab for further testing and solids measuring.
- All units are supported by a performance guarantee and warranty.
- The Client follows all terms and conditions detailed on the performance guarantee.
- The Client allows AA visitation rights upon verbal or written notification.

Next Steps to A Design

- Client completes AA evaluation form.
- To get a copy of our form:
 - ✓ Go to www.bluefrogssystem.com
 - or
 - ✓ Contact Brandi Waters: brandi@bluefrogssystem.net or 386.233.5074
- Within 5 – 7 days a preliminary design is completed with pricing.
- Client attends a webinar to review design concept details.
- AA Engineers work in jointly with approved consulting engineer.
- AA provides an electrical schematic and works directly with the clients electrical team.
- AA assists in completing documentation for RFP and Regulatory approval process.
- All designs are provided with a performance guarantee.
- Installation can be completed within 4-6 weeks.

Electrical Provided by AA

- Panel Boxes (panel boxes are provided for each BF unit scheduled for installation)
 - ✓ Push Button On/Off Switches
 - ✓ Reverse Capability (where applicable)
 - ✓ Overload Protection and Phase Protection
 - ✓ Box Disconnects

Electrical Provided by the Client

- Licensed Electrician to wire up units
- Mounting Posts & Brackets
- Supply Cords

BF's & GF's require 12/4 SOOW 4.5 amp

- ✓ The 10 HP 15-amp Pump for the Gold Frog is wired separately. The Required Cord is 12-4 SOOW (equal or better).

YF's require 12/7 SOOW 4.5 amp

- The Blower is 1.25 HP 2-amp and is wired in combination.

Blue Frog Technology

- Minimizes cost!
 - Eliminates cost of dredging long-term.
 - Bio dredges in situ.
 - Increases pond capacity.
 - Revitalizing to a healthy state.
- Modular system can be designed to meet a client immediate project & financial scopes.
- Minimizes financial risk.
 - All Projects are supported with a performance guarantee.
- Available Lease Purchase Option with Low Interest Rates.