



APPLICATION FOR A LETTER OF PERMISSION FOR: TREATMENT OF AQUATIC PLANTS IN THE FOX CHAIN O' LAKES

Return completed application to: Division of Fisheries
Impoundment Program
8916 Wilmot Road
Spring Grove, IL 60081
Phone: 815/675-2319
Fax: 815/675-2495

The IDNR shall issue or deny issuance of the requested "Letter of Permission" within 45 days after receipt of an acceptable application.

Applicant's Name: FRIENDS OF CATHERINE AND CHANNEL LAKES		Applicant's Telephone Number(s) with Area Code: () 312-506-8169
Applicant's mailing Address (No. & Street, City, State, Zip Code): 3216 N. HOYNE AVE., CHICAGO, ILLINOIS 60618		
Client's name (First, Last): APRIEN ROBINSON		Client's Telephone Number(s) with area code: () 312-506-8169
Client's Mailing Address (No. & Street, Box No., City, State, Zip Code): 24525 N. HARVEST GLEN RD., CARY IL 60013		
Lake Name: CHANNEL LAKE		
Type of Treatment: <input checked="" type="checkbox"/> Chemical <input type="checkbox"/> Non-chemical Date of Treatment: ONCE IN MAY, JUNE, JULY & AUG		
Location of Treatment Area: (illustrate detailed map on reverse side) see attached		
CHEMICAL(S) TO BE USED: <i>see attached SAFETY DATA SHEET</i>	Brand Name: LAKE CLARIFYING BACTERIA BY	
	Chemical Name/Formulation: AIR DIFFUSION SYSTEMS (ADS)	
	Concentration of active ingredient in ppm or ppb: 500 CFU/G	
	Dosage rate in amount (gallons, ounces, pounds) per acre-foot, surface acre, or square ft.: see attached	
	Method of application: soluble packets or	
Description of non-chemical treatment: evenly spaced.		
SIZE OF AREA PROPOSED TO BE TREATED:	Lake Site - Area: _____ (sq ft) ; Area extends 1,200 feet parallel to shore by 1,000 feet lakeward, out to the water depth of 18 feet, with an average depth of 7 feet; or is a Channel _____ feet long and _____ feet in width with an average water depth of _____ feet; or is a bay, pond or cove _____ acres in surface area with an average water depth of _____ feet.	
	≈ 27 surface acres	
Applicator's Signature: <i>[Signature]</i>		IDOA's Pesticide Applicator's License No.:
Describe plant community and percentage of abundance of each species within treatment area: Eurasian Milfoil, Curly leaf Pondweed, Coontail > 50%		
Justification for chemical use: (description of uses being impaired by plants and if treated before; when, with what and why treatment did not work): Milfoil & Pondweed are a nuisance to boaters (see attached)		
Describe alternative treatments considered and why deemed infeasible on the proposed treatment site: looking for alternative to 2,4-D. and dangerous to swimmers.		
I hereby make application for a Letter of Permission to destroy or control aquatic vegetation as described above. I understand that an IDNR representative may wish to inspect the proposed treatment area before, during and/or after work is completed. I understand the treatment area has to be posted in accordance with water/fishing restrictions stated on the chemical label and I certify that any affected property owner's association and/or any riparian property owners adjacent to and within the treatment area have received a copy of this application and have given permission to apply an aquatic herbicide and to "take" listed aquatic plants. I further certify that the treatment area is not within twenty (20) miles upstream of any potable water supply or food processing water supply.		
Applicant's Signature: <i>[Signature]</i>		Date: 1/28/2019

Draw detailed sketch of the lake or attach a copy of a detailed lake map with the proposed treatment area dimensions/boundaries clearly illustrated and with pertinent information (legal location, name of shoreline property owner, landmark, point, bay, etc.) which would facilitate locating the treatment site for possible inspection.

LEGAL DESCRIPTION OF TREATMENT SITE:

Twp: _____ Range: _____ Qtr. Section: _____ Map scale:

North

see attached maps

<u>DNR Review:</u>	<u>Recommended</u>	<u>Not Recommended</u>	<u>Signature/Date</u>
Regional Fisheries Adm.	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fox Waterway Agency	<input type="checkbox"/>	<input type="checkbox"/>	_____
CERP Review	<input type="checkbox"/>	<input type="checkbox"/>	_____
Chief, Division of Fisheries	<u>Approved</u> <input type="checkbox"/>	<u>Denied</u> <input type="checkbox"/>	_____

AQUATIC PLANTS

Aquatic plants are a critical component in lakes as they contribute to the uptake of available nutrients such as phosphorus from the water column making it unavailable for use by algae, filter sediments and other pollutants from the water, and stabilize bottom substrates. They also provide habitat for nesting and nursery for fish and other aquatic organisms. At times, nuisance growth has been encountered by lake managers due to invasive species and eutrophication. Good data allows lake managers to be more efficient and environmentally sound when managing lake vegetation.

In April, 2014, an aquatic vegetation survey was conducted on Channel using the point survey method. In order to accomplish this a randomized 60-meter grid was overlaid on an aerial photo of Channel Lake using ARCGIS10. A total of 413 points fell within the lake footprint. Above the 12 ft depth, which is the average depth that plants are likely to be detected given a 3—5 ft. Secchi depth, every point was sampled regardless of whether plants were detected or not, if plants dropped out of the littoral zone after 12 ft. depth, points lying at greater depths were not sampled. To sample the vegetation, a rake was lowered into the water and then scored from 1—5 (Appendix A, Table 7). Each species was scored from a modified scale. The scales were then converted to a percentage value using the midpoint of a percentage range which was associated with each score. The midpoint was used to establish species cover. A total of 227 points were sampled and species cover, relative cover, frequency, relative frequency and relative importance were quantified using a modified Braun-Blanquet scale (Mueller-Dombois, Ellenberg, 2002) Appendix A, Table 7 presents the estimated cover, frequency and relative importance for each species detected in the April, 2014 survey. A ranking of relative importance determined dominant species in the lake.

In 2014, vegetation was found at 46.7% of the 227 points sampled in the lake with an estimated cover of 31.2%. Ten plant species and Chara, a macro-algae were detected. Three floating plants were co-dominant; Coontail, White Water Lily and Star Duckweed. Coontail, is a native submerged aquatic species, and is tolerant of low light conditions. Due to the early sampling that took place in Channel Lake,

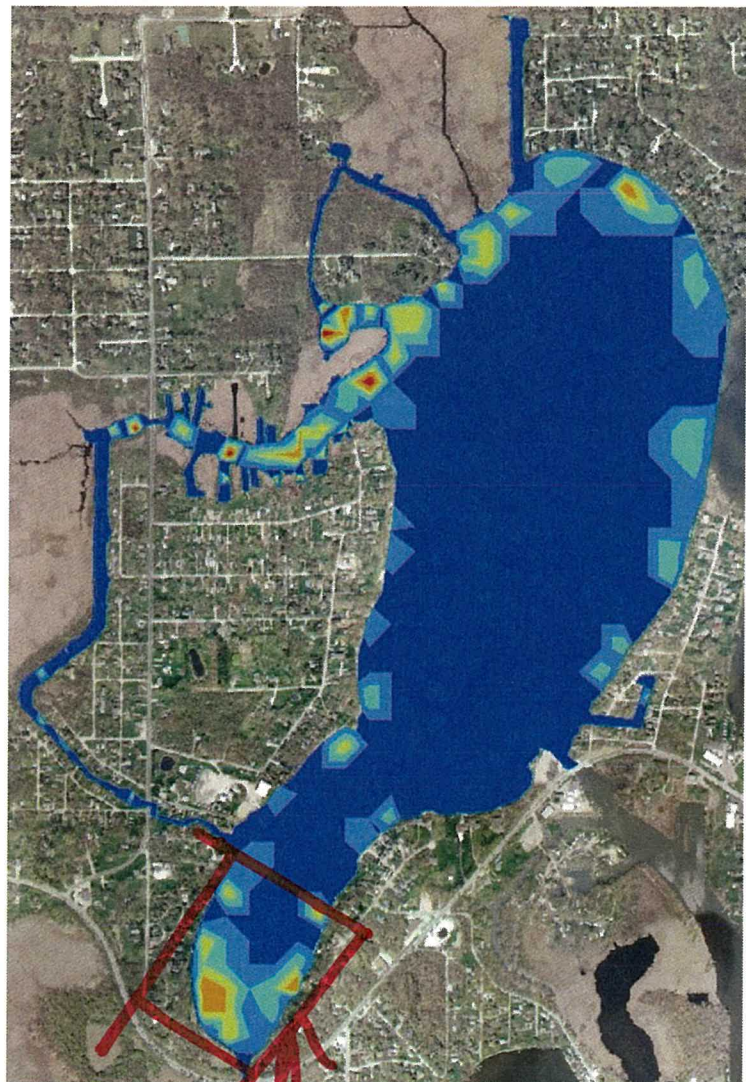


Figure 10. Status of vegetation in Channel Lake, July, 2014.

pilot area
 ~27 surface acres
 @ south end of
 Channel Lake.

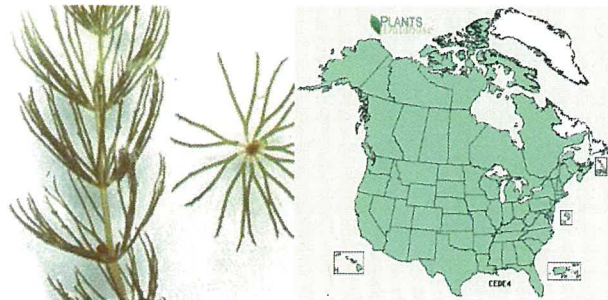
some species may have not emerged due to cool water temperatures. In May, the water temperature in Channel Lake averaged 11.2°C (52.16°F). Many native aquatic plants do not begin to actively grow until water temperatures reach 59°F. Figure 10 is a map displaying areas of vegetation in Channel Lake based upon the April survey (Appendix A, Figure 6).

A floristic quality assessment was performed using the aquatic plant species found in Channel Lake generating a floristic quality index (FQI) of 18.8. A floristic quality assessment is commonly used in four applications; identification of natural areas, comparisons among sites, long term monitoring and monitoring of habitat restoration. Although there is no record of residents or associations managing the aquatic vegetation in Channel Lake the FQI can be a tool to lake managers or home owner associations (HOA's) to determine if activities in the watershed might be having an impact on the plant community and to keep a long term record of the dynamics of the aquatic vegetation. Due to the sampling of the vegetation occurring in April, it is likely that later in the season there were more species present and the FQI would have been higher. The LCHD-ES is recommending that Channel Lake adopt a long term aquatic plant management plan that is developed by all stakeholders of the lake (lake associations, citizens, townships, park districts etc.). The plan would provide a template that describes the goals of aquatic plant management in Channel Lake and defines objectives to help attain those goals. If a plan is not developed it is recommended that the native plant community be increased in areas where plants can colonize, if chemical treatments are used to control invasive species, they should occur when water temperatures are cooler in order to retard the microbial breakdown of chemical as well as to ensure that chemicals have minimal if any impact to native plant populations. Other considerations are whether plants are monocots or dicots; Curlyleaf Pondweed (monocot) and Eurasian Watermilfoil (Dicot) were both present in the April survey; Therefore the strategy might differ for targeting one species over the other or if you were to target both.

AQUATIC PLANTS (CONTINUED)

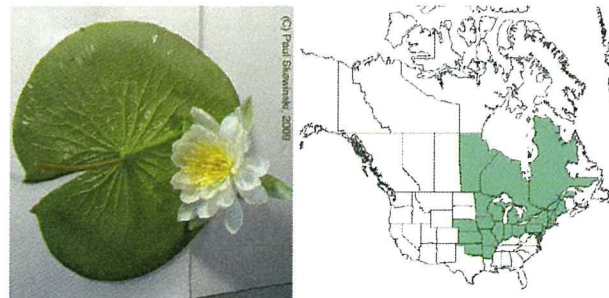
COONTAIL (DICOT)

Coontail (*Ceratophyllum demersum*) is a widespread native in and around the United States and Canada. It is identified by its forked whorl of leaves which extends the length of the stem. Early in the season, plants can be confused with Chara, a macroalgae.

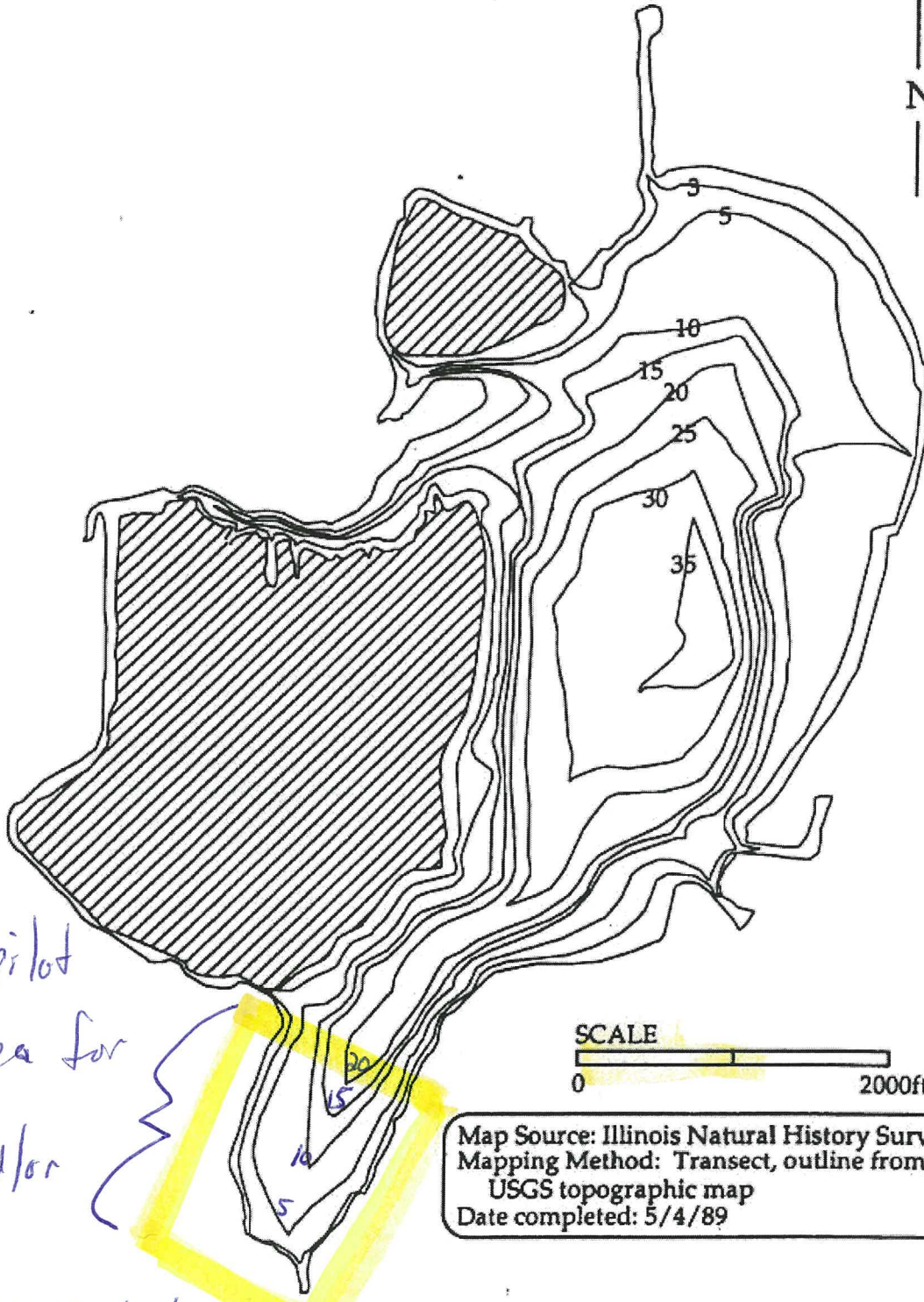


WHITE WATER LILY (MONOCOT)

White Water Lily (*Nymphaeae tuberosa odorata*) is a widespread native in and around the United States and Canada. It is identified by its floating round leaf with a slit from near the center of the leaf to the leaf edge. The leaf stalk is round in cross section. It has a showy white composite flower that sits on the surface of the water. It can be confused with Spatterdock and American Lotus.



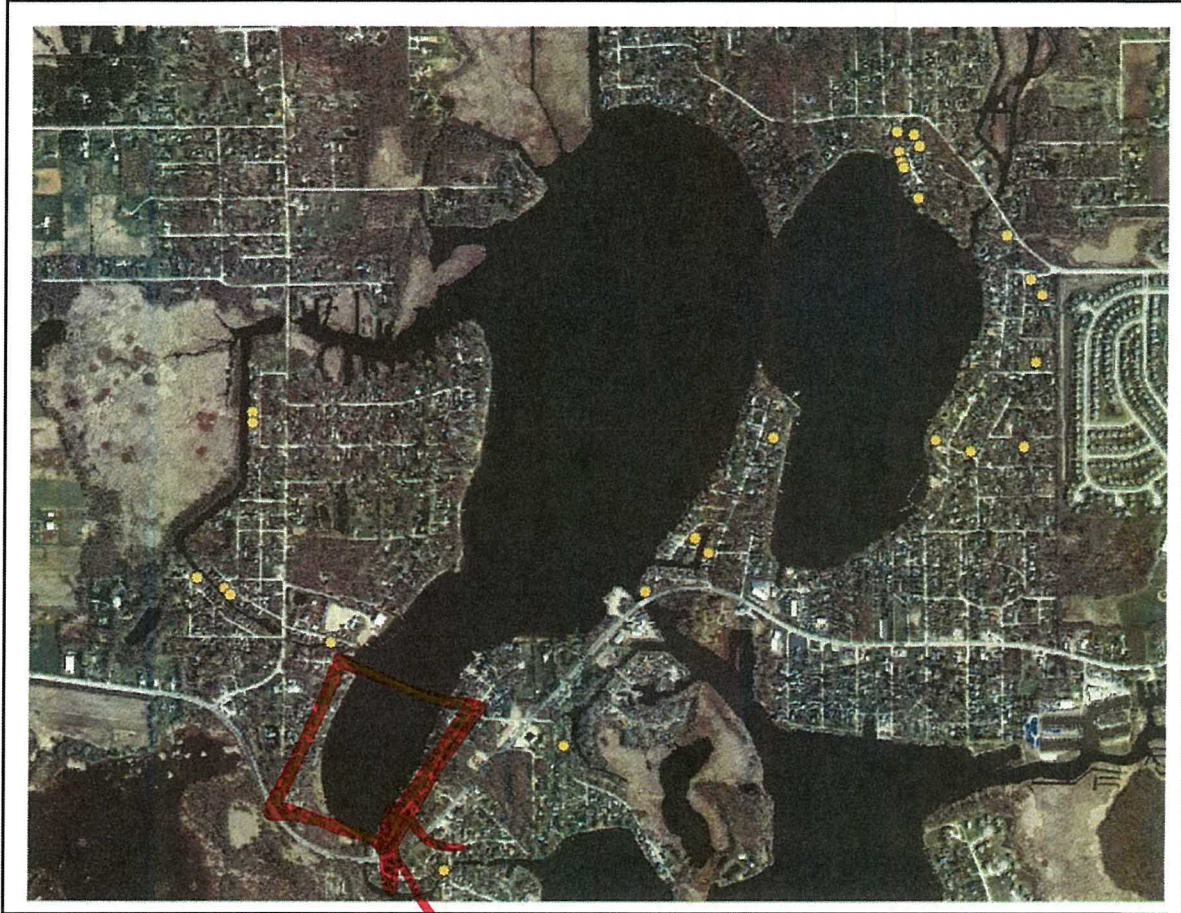
CHANNEL LAKE (Fox Chain of Lakes)



proposed pilot
study area for
LCB and/or
aeration
1,000' wide x 1,200' long

SCALE
0 2000ft

Map Source: Illinois Natural History Survey
Mapping Method: Transect, outline from 7.5 min.
USGS topographic map
Date completed: 5/4/89

Appendix 5**Septic Connections feeding into Lake Catherine/Channel Lake***(Map supplied by Lake County Health Department)*

Contact Tom Copenhaver at Lake County Health Department for more information.

- Phone: 847-377-8000
- Email: TCopenhaver@lakecountyil.gov

PILOT AREA

Fecal coliform data from the 2000 report provided extensive review of 1998 and 1999 Lake County Health Department monitoring (page 85) that showed no exceedances of the state standard for primary contact (500 cfu's for swimming). There are sites where concentrations are elevated (up to 220 cfu's) but still considered safe.

As with other data, snap shots in time of water quality, especially a biological parameter like fecal coliform, can be unreliable or misleading.

Lake Clarifying Bacteria (LCB)

Safety Data Sheet

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Name: Lake Clarifying Bacteria

1.2. Intended Use of the Product

Lake clarification & restoration. For professional use only.

1.3. Supplier

Air Diffusion Systems (ADS)
3964 Grove Avenue
Gurnee, IL 60031
847-782-0044
www.airdiffusion.com

1.4. Emergency Telephone Number

Emergency Numbers ADS Office (847) 782-0044 ADS Cell: 847-848-8877

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Comb. Dust

Eye Irrit. 2A H319

STOT SE 3 H335

2.2. Label Elements (GHS-US Labeling)

Hazard Pictograms



GHS07

Signal Word

: Warning

Hazard Statements

: May form combustible dust concentrations in air
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation.

Precautionary Statements

: P264 - Wash hands, forearms, and exposed areas thoroughly after handling
P280 - Wear eye protection, protective clothing, protective gloves
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 - If eye irritation persists: Get medical advice/attention

2.3. Other Hazards

Other Hazards Not Contributing to the Classification: Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

2.4. Unknown Acute Toxicity

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture*

Name	Product identifier	%	Classification (GHS-US)
Rice hulls	----	Proprietary**	Comb. Dust
salt	---	Proprietary**	Eye Irrit. 2A H319 STOT SE 3 H335

**The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret in accordance with Paragraph 1910.1200 of Title 29 of the Code of Federal Regulations.

Full text of H-phrases: see section 16

Lake Clarifying Bacteria (LCB)

Safety Data Sheet

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

Skin Contact: Rinse immediately with plenty of water. Obtain medical attention if irritation develops or persists.

Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: Causes serious eye irritation.

Inhalation: May cause respiratory irritation.

Skin Contact: May cause skin irritation.

Eye Contact: Causes serious eye irritation.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: None expected under normal conditions of use.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Combustible Dust. Dust explosion hazard in air. Under conditions of fire this material may produce: Carbon dioxide (CO₂). Carbon monoxide.

Explosion Hazard: Avoid dust clouds in combination with static electricity. Dust clouds can be explosive.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid all contact with skin, eyes, or clothing. Avoid breathing dust.

6.1.1. For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain and collect as any solid. Use explosion proof vacuum during clean up, with appropriate filter, do not mix with other materials. Use a soft bristle brush or conductive rubber or conductive plastic shovel. Use caution, material is sensitive to initiation from sources such as heat, flame, shock, friction, or sparks.

Methods for Cleaning Up: Avoid generation of dust during clean-up of spills. Vacuum must be fitted with HEPA filter to prevent release of particulates during clean-up.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Precautions for Safe Handling: Take precautionary measures against static discharge.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Lake Clarifying Bacteria (LCB)

Safety Data Sheet

Incompatible Products: Strong acids. Strong bases. Strong oxidizers.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

8.2. Exposure Controls

Appropriate Engineering Controls

: Provide adequate ventilation to minimize dust concentrations. Ensure all national/local regulations are observed. Proper grounding procedures to avoid static electricity should be followed. Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Personal Protective Equipment

: Protective goggles. Gloves. Protective clothing. Dust formation: dust mask.



Hand Protection

: Wear chemically resistant protective gloves.

Eye Protection

: Chemical goggles or safety glasses.

Skin and Body Protection

: Wear suitable protective clothing.

Respiratory Protection

: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Light brown powder
Odor	: No data available
Odor Threshold	: No data available
pH	: No data available
Relative Evaporation Rate (butylacetate=1)	: No data available
Melting Point	: No data available
Freezing Point	: No data available
Boiling Point	: No data available
Flash Point	: No data available
Auto-ignition Temperature	: No data available
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: No data available
Relative Vapor Density at 20 °C	: No data available
Relative Density	: No data available
Specific Gravity	: No data available
Solubility	: No data available
Partition coefficient: n-octanol/water	: No data available
Viscosity	: No data available

9.2. Other Information

No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity: Hazardous reactions will not occur under normal conditions.

10.2 Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

10.3 Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4 Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.

10.5 Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

10.6 Hazardous Decomposition Products: Under fire conditions this material may produce hazardous carbon dioxide (CO₂), carbon monoxide (CO), various low molecular weight hydrocarbons, and smoke.

Lake Clarifying Bacteria (LCB)

Safety Data Sheet

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Toxicological Effects

Acute Toxicity: Not classified

Proprietary	
LD50 Oral Rat	3 g/kg
LC50 Inhalation Rat (mg/l)	> 42 g/m ³ (Exposure time: 1 h)

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Inhalation: May cause respiratory irritation.

Skin Contact: May cause skin irritation.

Eye Contact: Causes serious eye irritation.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: None expected under normal conditions of use.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Proprietary	
LC50 Fish 1	5560 (5560 - 6080) mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [flow-through])
EC50 Daphnia 1	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	12946 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
EC50 Daphnia 2	340.7 (340.7 - 469.2) mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

12.2. Persistence and Degradability No additional information available

12.3. Bioaccumulative Potential

Proprietary	
BCF fish 1	(no bioaccumulation)

12.4. Mobility in Soil No additional information available

12.5. Other Adverse Effects

Other Information : Avoid unintended release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Ecology – Waste Materials: Avoid release to the environment.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT Not regulated for transport

14.2 In Accordance with IMDG Not regulated for transport

14.3 In Accordance with IATA Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

Proprietary	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Proprietary	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Proprietary	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Lake Clarifying Bacteria (LCB)

Safety Data Sheet

15.2 US State Regulations

Proprietary
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision : 05/01/2017

GHS Full Text Phrases:

Comb. Dust	Combustible Dust
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
H232	May form combustible dust concentrations in air
H319	Causes serious eye irritation

Disclaimer: *This data sheet was developed from information on the constituent materials identified herein and does not relate to the use of such materials in combination with any other material or process. No warranty is expressed or implied with respect to the completeness or ongoing accuracy of the information contained in this data sheet, and Air Diffusion Systems disclaims all liability for reliance on such information. This data sheet is not a guarantee of safety. Users are responsible for ensuring that they have all current information necessary to safely use the product described by this data sheet for their specific purpose. Air Diffusion Systems is not responsible for the unintended use or misuse of this product. For questions and details regarding product use, please contact Air Diffusion Systems*

Other Information:



Air Diffusion Systems

Fine Bubble Aeration For Water & Wastewater Treatment

3964 Grove Avenue, Gurnee, Illinois 60031 USA

Phone: (847) 782-0044 Fax: (847) 782-0055 Email: info@airdiffusion.com

Lake Clarifying Bacteria (LCB) by Air Diffusion Systems

Lake Clarifying Bacteria (LCB) is formulated for surface water environments such as lagoons, ponds, lakes, and river systems. LCB contains multiple strains of bacteria selected for their ability to utilize and remove excess nutrients and eliminate odors. LCB naturally improves water quality by digesting organic material contained within the water body. The utilization and digestion of the organic material allows for better water clarity and promotes a healthy ecosystem.

Carrier: Salt, Bran

Concentration: 4 or 50 Billion CFU/g

Storage and Handling: Dry and Cool (36-77°F/2-25°C)

- Note: Keep container closed tightly when not in use.

Shelf Life: Two years when stored as recommended.

Product Specifications:

- Microbiological Specifications
 - Coliforms < 10 CFU/g
 - Salmonella negative/25 g
- Physical Properties
 - Color: Tan, White
 - Form: Powder
- Packaging
 - 25x1lb WSP (4B)
 - 50lb fiber drum (4B or 50B)

Application Guidelines:

- pH Range: 5.5-9.0 (Optimum 6.0-8.0)
- Temperature Range: Above 50 degrees

Restrictions: Safe for recreational ponds, animals, birds, pets, fish, wildlife and the environment. Do not apply to water that will be used for human consumption.

Usage Rates: Apply to the water body every week or until conditions improve. LCB is in a water soluble bag and can be tossed into the body of water for ease of treatment.

	[PRODUCT NAME] 4B		[PRODUCT NAME] 50B	
	Maintenance (lbs.)	Stress 2X (lbs.)	Maintenance (lbs.)	Stress 2X (lbs.)
Initial Dose*	½	1	0.04	0.08
Weekly Dose*	½	1	0.04	0.08

*Apply the following rate per acre foot

Mixing Directions:

Mix clean water in an adequate volume to dissolve the LCB For optimal rehydration of the organisms, allow the solution to set for a minimum of 30 minutes, but no longer than eight hours before application.

Key Features:

- Six (6) strain *Bacillus* blend providing optimal activity and enzyme production across a broad range of environmental conditions
- Enhances the effectiveness of most biological waste treatment systems used to treat organic material
- Effective growth and treatment across broad pH and temperature ranges
- Facultative organisms - works in both aerobic and anaerobic environments
- All natural, non-toxic, and non-GMO
- Stable - two year shelf life

Key Benefits:

- Reduces/eliminates organic matter
- Reduces/eliminates odor
- Improves water quality
- Reduces nutrients
- Improves water clarity
- Promotes balance in aquatic environment



Lake Clarifying Bacteria (LCB)

Description:

Lake Clarifying Bacteria (LCB) is formulated for surface water environments such as lagoons, ponds, lakes, and river systems. LCB contains multiple strains of bacteria selected for their ability to utilize and remove excess nutrients and eliminate odors. LCB naturally improves water quality by digesting organic material contained within the water body. The utilization and digestion of the organic material allows for better water clarity and promotes a healthy ecosystem.

Product Specifications

Microbiological Specifications

- Coliforms < 10 CFU/g
- Salmonella negative/25g

Physical Properties

- Color: Tan, White
- Form: Powder

Carrier: Salt, Bran

Water soluble packets in bran form

Concentration

4 or 50 Billion CFU/g

Storage & Handling

Dry and cool (36-77°F/2-25°C)

*Keep container closed when not in use.

Packaging

- 25 x 1lb. WSP (4B)
- 50lb. fiber drum (4B or 50B)

LCB Formats:

- Bulk • 1.2 lbs dissolvable packets • 1 lb. dissolvable packets.

All three formats are delivered in 25-pound sealed pails.

Key Features

- Six (6) strain Bacillus blend providing optimal activity and enzyme production across a broad range of environmental conditions.
- Enhances the effectiveness of most biological waste treatment systems used to treat organic material.
- Effective growth and treatment across broad pH and temperature ranges.
- Facultative organisms- works in both aerobic and anaerobic treatment systems.
- All nature, non-toxic and non-GMO
- Stable - two year shelf life

Key Benefits

- Reduces/eliminates organic matter
- Reduces/eliminates odor
- Improves water quality
- Reduces nutrients
- Improves water clarity
- Promotes balance in aquatic environment

Application Guidelines

	LCB 4B		LCB 50B	
	Maintenance (lbs.)	Stress 2X (lbs)	Maintenance (lbs.)	Stress 2X (lbs.)
Initial Dose*	1/2	1	0.04	0.08
Weekly Dose*	1/2	1	0.04	0.08

* Apply the following rate per acre foot.
* 1 acre-foot ~ 325,000 gallons

Optimization Considerations

	Range	Optimum
pH Range	4.5-9.0	6.0-8.0
Temperature	Above 50 Degrees	Above 50 Degrees

Restrictions

Sale for recreational ponds, animals, birds, pets, fish, wildlife and the environment. Do not apply to water that will be used for human consumption.

Mixing Directions

For optimal performance and ease of distribution, dissolve (or pour) 1 packet of LCB into a 3 - 5 gallon pail filled with dechlorinated water. Allow the solution to rest for a minimum of 30 minutes, but no longer than eight hours before application. Once rehydrated, apply directly to water using a cup or pump sprayer. If situation does not allow for rehydration and activation, the product can be applied directly to water. Puncturing the dissolvable bag with several small holes is recommended when tossing packets directly into water.





Air Diffusion Systems

Fine Bubble Aeration For Water & Wastewater Treatment

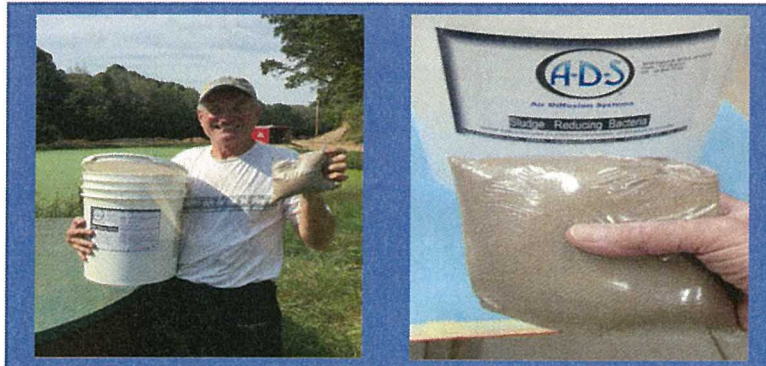
Project Name: Channel Lake, IL
ADS Project #: 16-088
Date: 8/9/2018

For close to 30 years, ADS has successfully incorporated "bio-augmentation" programs for hundreds of wastewater treatment facilities across the United States with great success. Lake Clairifying Bacteria is a proprietary blend of beneficial bacteria ideally suited for controlling "lake green water", oils, grease, and sludge. LCB comes in 1.1 pound (0.5 kilogram) dissolvable packets, which can be thrown directly into both lagoons from shore or from a boat. LCB packets can also be pumped or sprayed into the lake. Below is a summary of the cost, and treatment plan:

Note: The proprietary blend of bacteria has been certified to be non-pathogenic.

LCB Plan for 3 Months		
Volume	250.00	MG
Concentration	0.1	mg/l
Lbs/Mo LCB	209	Lbs/Month
40B (Kg/Mo)	95	Kg/Month
Packets for 3 Months	640	Packets
Price: \$ 15,488.00 + Shipping		

The ADS LCB program provides long-term, effective treatment at a fraction of the cost and man-hours associated with physical sludge removal. The system will receive the listed number of packets delivered weekly or every other week.



Pictured Above: John Hinde, President of ADS, holds a packet of SRB (1.1 LBS)

The proposed LCB program will significantly reduce accumulated sludge, minimize odors, and improve treatment achieved. If you have any questions or would like to modify the proposed SRB program, please let us know.

3964 Grove Avenue, Gurnee, Illinois 60031 USA

Phone: (847) 782-0044 Fax: (847) 782-0055 Email: info@airdiffusion.com

Lake and Pond Solutions



MD Pellet Program on Viewcrest Channel, Delavan Lake, WI.

by Sean Kollmer

Where We Begin..

Delavan Lake, is a premier recreational destination in South-East Wisconsin. Over 1900 acres and 52 feet deep, this fish factory is home to many species of game fish, including Walleye. Delavan is also frequented in the summer months by other recreational users including pleasure cruisers, speed boats and personal water crafts.

Many lakes have been impacted by increased human presence, so too is the case for Delavan. Its large watershed (17:1) is now largely comprised of agriculture and its tributaries and inlets are susceptible to sediment accumulation. This area of the U.S. is known for its healthy and organic soils, which supports a variety of healthy terrestrial and aquatic flora. An over abundance of nutrients however has its drawbacks. In the 1980's Lake Delavan's ecosystem began to decline drastically due to infestations of undesirable fish (carp) and excessive nutrients leading to anoxic conditions and blue-green algae blooms; something had to be done.

"..WHICH IS HOW THE AQUAFIX TEAM BECAME AN INTEGRAL PART OF THE FIGHT AGAINST DELAVAN'S EXCESSIVE ORGANIC SEDIMENT."

Pg 1.

Rehabilitation efforts in 1990 were aimed at restoring the attractive lake back to its former glory. After a drawdown and much work to the lake including the addition of three sediment ponds in the tributary, the lake has made a positive comeback. However, its watershed continues to challenge lake managers. Sediment deposition remains a key topic, which is how the Aquafix Team became an integral part of the fight against Delavan's excessive organic sediment.

The Channel..

The Viewcrest Channel is located on the northern end of Delavan Lake's western bay. See Figure 2 on pg. 2

The horseshoe-shaped channel is home to 110+ semi-permanent boat slips. The northern end is open to boat traffic whereas after the last pier on the southern end, it becomes too shallow. However, the back of the channel is connected to the main lake via a three-foot diameter culvert.

Objective..

Due to the relatively stagnant nature of this modified channel, it is a strong candidate for sediment deposition. The breakdown of the organic components in the sediment through the use of Aquafix MD Pellets will allow for increased depth and flow, thus reducing stagnation and accumulation of floating plants and organic sediment.

Methods:

Using a 25 pound-per-acre rate, five monthly applications of 75 pounds were used, totaling 375 pounds for the season.

Before each application a technician measured the water and sediment depth at six locations using a measuring pole. [Locations shown in the top of Figure 2]. The locations were chosen based on proximity to identifiable structures. This was done to maintain a consistent and repeatable measuring area during the following months. A Global-Positioning-Satellite location was also recorded for each location in the event those structures were lost. A sampling site was designated to the beginning and the end of the channel as well as four evenly spaced locations around the curve.

The ten-foot pole included marked measurements down to 0.1 feet and included a disk with perforations and o-ring (Figure 1). Once the pole was placed in the water the pole was lowered down to the sediment, the perforated disk would remain on top of the sediment while the pole pushed through to hard-pan refusal. Upon extraction, the disk would fall back into place but the o-ring would remain at the deepest depth reached, indicating the depth of sediment.

With the recordings made, a small watercraft holding two people would apply the MD Pellets by hand, starting at point 6 and working towards point 1. The pellets were spread out as evenly as possible while avoiding other watercrafts.

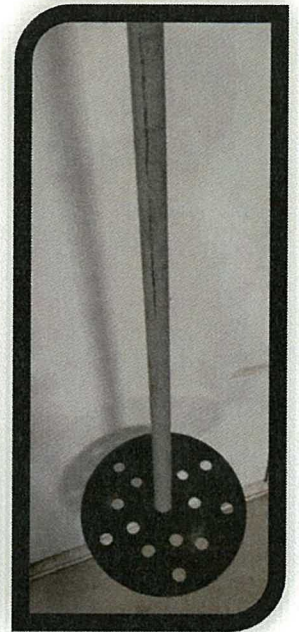


Figure 1: Measuring Pole

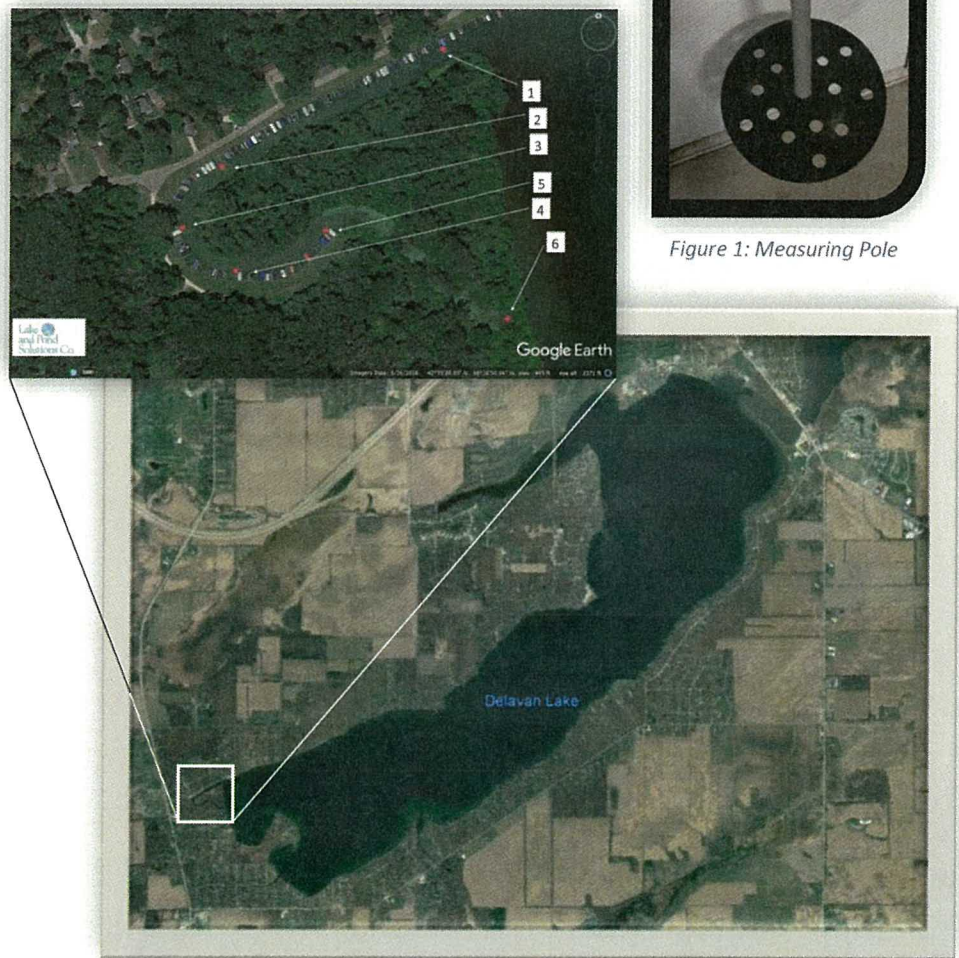


Figure 2: Close up of Viewcrest Channel on Delavan Lake.

Results..

Between the first recording and application on May 24th 2017 and the final recording (one month after the final application) on October 19th 2017 the average sediment depth throughout the channel decreased by 1.08 feet. An average between all six sample points during each sample period is depicted in Figure 3. Figure 4 shows that sediment decreased at each location between these two sampling dates, with the exception of point number 5, where it increased by 0.1 foot. Point 1 saw a 23.4 inch reduction in sediment. Point 2 = 22.2” reduction, Point 3 = 4.2” reduction, Point 4 = 13.2” reduction, and point 6 saw a 15.6” reduction between these sample periods.

Discussion..

The amount of deposited sediment observed over the course of this season has decreased in almost all locations. The slight increases in the fall are likely due to several variables, including rain events and plant senescence. The impact of the July flooding to the channel may have been delayed due to limited inflow and its protected location adjoining a large body of water. With a reduction in sediment comes an increase in average water depth, allowing for better navigation within the channel, its prime function.

Considering the amount of sediment that persists within the channel, particularly between point 5 and 6, and the proven success of the program during its first season, there is reasonable evidence to continue this program until determined otherwise. In the future, it may be beneficial to test the organic matter content of the sediment to better understand the potential effectiveness of the MD pellets in future applications.

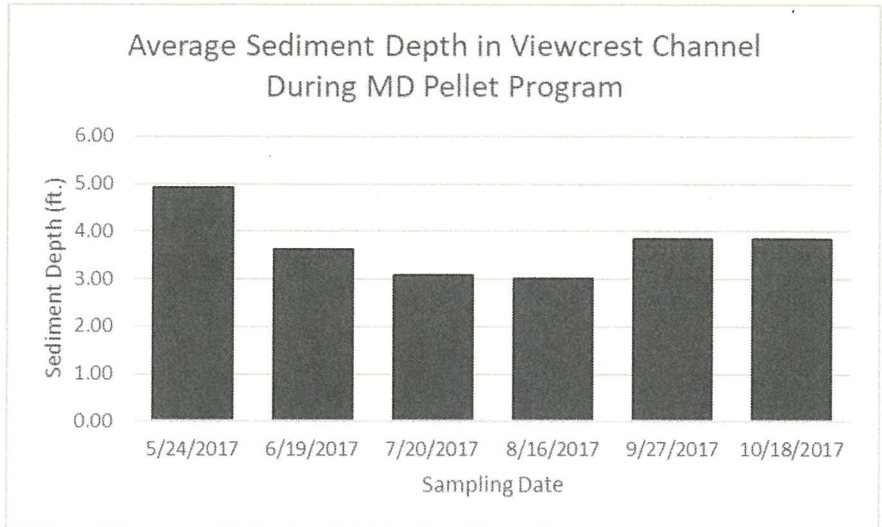


Figure 3: Average sediment depth between each of the six sample points during the monthly survey.

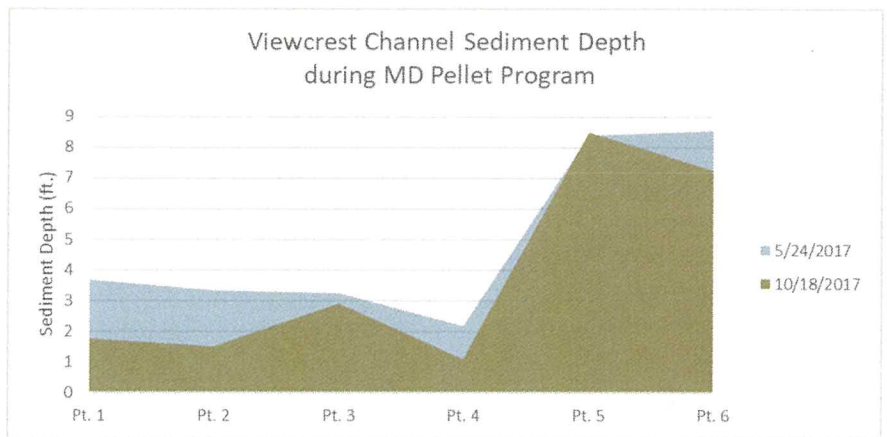


Figure 4: Actual sediment depth of each point during the first and last sample periods. Blue represents May and brown represents October.

SAMPLE REPORT #2



CASE STUDY: Targeted Muck Reduction with Triton SRP (Sludge Reduction Pellets)

NOVEMBER 2016

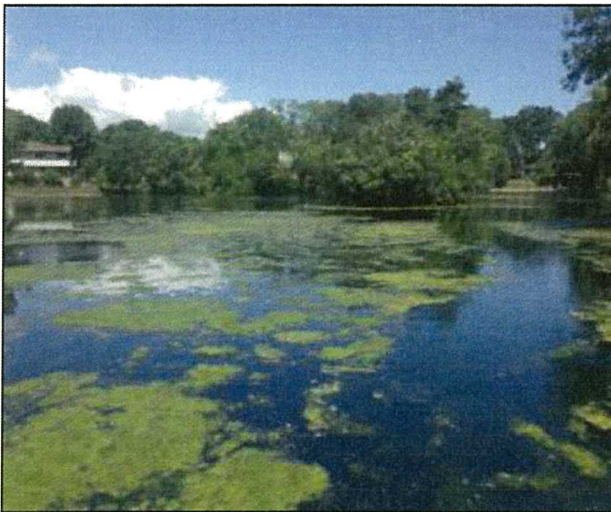
PROJECT OVERVIEW

Mallard Lake is a 6.5 acre private stormwater lake located in SE Wisconsin. It has three main fingers and three small islands located on the southern portion of the lake. The maximum depth is 10.9' while the average depth is 5.1'. Despite having a 12-diffuser summer aeration system and a SolarBee for winter aeration, the lake saw extensive fish kills during the winters of 2009 and 2014.

Following a 2014 fish kill, total phosphorus and dissolved phosphorus in the lake quadrupled to 0.280 ppm and 0.110 ppm, respectively. As expected, algae growth exploded including difficult to control species like hydrodictyon, pithophora, and spirogyra.

Mallard Lake Stats

Acreage	6.50
Max Depth	10.9'
Average Depth	5.1'
< 3' Deep	20.40%
3 - 6' Deep	46.10%
6 - 9' Deep	27.20%
> 9' Deep	6.30%
Avg. Dissolved P	0.127 ppm
Avg. Total P	0.228 ppm



Hydrodictyon growth on Mallard Lake (2014)

In 2015, spring sampling showed another staggering increase in total and dissolved phosphorus (double from the previous spring). The thought was that decaying fish from the previous year had charged lake sediments with high amounts of phosphorus. The HOA undertook a nutrient reduction program using aluminum sulfate in an attempt to significantly reduce phosphorus levels. Although the treatment was successful by dropping phosphorus and limiting algae growth, it was short lived as phosphorus soared even higher by the fall.

During the winter of 2015, Mallard Lake HOA and LPS decided on a plan to look at the soft sediment accumulation and reduction as a way to reduce in-lake nutrient loading.

METHODS

Due to the sheer size of the pond, 3 key areas of excessive soft sediment accumulation were chosen as test sites (see inset picture on right). The NW area was 0.16 acres in size, the NE area was 0.17 acres in size, and the South area (near the outflow) was 0.09 acres in size.

On March 28th, 2016, LPS took soft sediment readings in each area using a custom marked 10-foot pole with a sediment disc. Random locations were chosen and depth of soft sediment was recorded.



An aggressive 42#/acre rate of Triton SRP was chosen and applied monthly for five months (May – September) in order to achieve accelerated results. Pellets were hand spread and all algae treatments were performed at least 3 days out from any Triton SRP application to limit adverse reactions.

On September 15th, 2016, LPS took post season soft sediment readings in each area. Random locations were again chosen and depth of soft sediment was recorded and averaged.

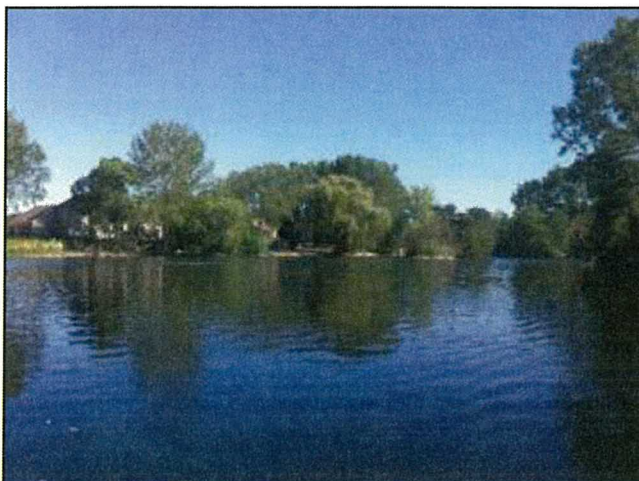
RESULTS

In the NW and South areas, average soft sediment was reduced by 5.85” – 14.5”. Those same areas also saw reductions in each minimum and maximum reading. The NE area did not show as much of an average reduction (3”) although the minimum reading did decrease. It should be pointed out that the NE end of this area is where the most extensive muck in the lake was found (42”). No aeration is present there and it’s theorized that oxygen demand was too great to achieve dramatic results. The control site, located at the SW end of the lake, saw no significant changes to soft sediment levels.

SUMMARY

Triton SRP applications of 42#/acre resulted in reductions of 3” – 14.5” over the span of all test areas. These results were confirmed by two separate Mallard Lake HOA members who performed their own soft sediment testing. In their sampling, they showed average reductions of 5.58” with maximum reductions up to 18”.

Mallard Lake Muck Depths				
NW LOBE				
DATE	MIN	MAX	AVG	Readings
3/28/2016	9	21	14.25	15,9,21,12
9/15/2016	0	18	8.4	18,6,0,6,12
NE LOBE				
DATE	MIN	MAX	AVG	Readings
3/28/2016	6	42	16.5	15,9,18,9,6,42
9/15/2016	0	42	13.5	0,9,0,6,42,24
S LOBE				
DATE	MIN	MAX	AVG	Readings
3/28/2016	21	24	22.5	21,24
9/15/2016	6	12	8.0	12,6,6
SW LOBE (Control)				
DATE	MIN	MAX	AVG	Readings
3/28/2016	8	17	12.4	8,14,12,17,11
9/15/2016	7	17	12.8	7,12,17,13,15
<i>Data collected by Lake and Pond Solutions Co. (2016)</i>				



“I’m encouraged as overall we saw an improvement on all the test areas. I’m sure we’ll never win the war but we’re putting up a good battle.” – Kurt L. (Mallard Lake HOA)

“These results are encouraging, especially when we know that if we did nothing, the muck layer would be thicker in the fall than in the spring.” – Ron L. (Mallard Lake HOA)

The Mallard Lake HOA in conjunction with Lake and Pond Solutions Co. have expanded the test areas in 2017.