

Stantec Consulting Services Inc.

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September 28, 2011 File: 004411-10003-0

White River Flowage Lake Management District W7529 White River Trail Wautoma, Wisconsin 54982

Dear: White River Flowage Lake Management District

Reference: Aquatic Plant Management Report for White River Flowage

The White River Flowage Lake Management District (the District) is a group responsible for the management of the lake's aquatic invasive species (AIS), mainly Myriophyllum spicatum (Eurasian Watermilfoil – EWM) and Potamogeton crispus (Curly-Leaf Pondweed – CLP). Bonestroo, Incorporated now known as Stantec Consulting Services, Incorporated (Stantec) was contacted by the District to provide a chemical herbicide treatment and survey of these AIS. Stantec furnished all labor, materials, tools and equipment necessary to perform all operations in connection with the chemical application of herbicides in select locations of the White River Flowage. This report provides a summary of observations, conclusions and recommendations for the management of AIS growth for 2011 and upcoming 2012 season.

PROJECT SUMMARY

This Aquatic Plant Management Report was produced as part of the aquatic plant management of the White River Flowage for 2011. The goal of the project was to control stands of EWM and CLP, to encourage growth of native aquatic plants that are out competed by EWM and CLP, to help improve the health of the lake ecosystem by restoring native habitat, and to improve the recreational and aesthetic value of the White River Flowage. The report reviews existing and historical data for the Flowage and activities that were conducted during 2011.

BACKGROUND

The White River Flowage is a 133-acre impoundment of the White River located in the Town of Dakota, Waushara County, Wisconsin. The White River flowage has a maximum depth of 20 feet and a mean depth of 6 feet. The White River Flowage Lake Management District is an active lake disctrict that has been managing aquatic plants on the lake through harvesting and chemical treatments. Both AIS (CLP & EWM) have been treated on the Flowage within the past few years.

2011 AQUATIC PLANT MANAGEMENT

The District contracted Stantec for the 2011 chemical treatment of EWM and CLP. Stantec, on behalf of the White River Flowage Lake Management District, was successfully issued a permit to chemically treat up to 9.9 acres of aquatic invasive species (EWM and or CLP where appropriate) for the 2011 season by the Wisconsin Department of Natural Resources (WDNR). A copy of the permit is included in Attachment A.

Before treatments began, a pre-treatment survey was necessary to verify the presence of EWM and CLP within the proposed treatment areas outlined in the permit. The survey was completed on May 3, 2011 and identified 6.51 acres of CLP, 0.98 acres of EWM, and 0.50 acres of combination beds with a EWM and CLP mix for a total combined treatment area of 7.99 acres.

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Reference: Aquatic Plant Management Report for White River Flowage

Chemical treatment was completed on May 17, 2011. 6.51 acres were treated for CLP growth, 0.98 acres for EWM growth, and 0.50 acres for a mix of CLP and EWM growth. Aquathol K® was applied at a rate of 1.0 – 1.5 parts per million (ppm) per acre foot (approximately 3 gallons per acre) to treat CLP in low current areas totaling 3.03 acres. Where CLP was present in high current areas, Aquathol Super K®, a granular version of Aquathol K®, was applied at the same rate (approximately 30 pounds per acre) over 3.48 acres. Navigate® was applied at a rate of 1.25 ppm per acre foot (approximately 200 pounds per acre) to treat areas of EWM. These products were selected in order to ensure adequate contact and control of submersed vegetation. In compliance with regulations, a treatment record was completed and is included in Attachment B.

In accordance with the treatment process, a post-treatment survey was conducted on July 16 2011 to verify treatment success. During the post-treatment survey, remaining and new areas of EWM and CLP were mapped. The affect of the chemical treatment was determined by examining the relative abundance and distribution of remaining aquatic macrophytes following treatment. Upon completion of the post-treatment survey, 1.5 acres of EWM and 4.25 acres of CLP were found within the White River Flowage (Figures 1 & 2). Treatment results for CLP in high-current areas were less than desired because of the quick reduction in herbicide concentrations due to the current. In areas of low current, CLP treatment was successful. Areas of EWM treatment also showed very good success with little re-growth in treated areas. However, EWM growth was again present in untreated areas, and most all were notably close to the main river channel again showing a likely dilution factor in areas of high water exchange thereby reducing herbicide effectiveness.

MANAGEMENT SUGGESTIONS

It is important that appropriate management actions continue on a yearly basis to ensure that nuisance invasive aquatic plant growth does not reach unmanageable levels. As seen in 2011, aquatic plant growth specifically EWM and CLP were highly reduced from levels seen prior to management activities within treated areas. Though an equal amount of CLP was found during the post-treatment survey, a vast majority of this is located within high-current areas. These areas are difficult to treat due the current and continued dilution from desired herbicide levels. It is recommended that the District go after a new approach to treat this area. These options can include current screens to shield the treatment area, but this would require additional DNR permitting as they would consider it a structure on a lake bed, if only temporarily. The cost for permit itself (Ch.30) would be required; the permit cost alone is \$500, plus any additional costs for preparation if not done by the District. The cost for the applicator to purchase and install and remove these would also likely increase the application cost by 50% or more. Stantec has discussed this option with WDNR staff and they are agreeable to this possible option. Another option to control CLP growth in these areas includes continued cutting and harvesting of these plants to prevent turion formation, this would have to start early in the season, likely mid May.

EWM areas decreased slightly from 2010 and were found scattered throughout the flowage at 1.5 acres. In the past, treatment of EWM with granular 2,4-D has been successful on the White River Flowage and it is again recommended that the District use this approach in the future. Because of current harvesting practice, this may spread further and actual acreages to be treated may be altered during a recommended pretreatment survey in 2012. It is recommended that the District does not harvest in areas of EWM to prevent spread of this AIS.

In light of the past year's chemical treatment success, we recommend continued surveys, mapping and chemical treatment of EWM and CLP in 2012 to ensure control. Though both AIS have been extensively reduced from historical levels, complete extirpation of these AIS from the White River Flowage is extremely unlikely and an unrealistic expectation. Current populations of AIS will fluctuate yearly and control actions should be altered accordingly. It is possible, if the District is interested, as AIS populations come under

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Reference: Aquatic Plant Management Report for White River Flowage

control to a small and more manageable size, that District members can monitor the lake for historic and new AIS infestations and contract with a qualified consultant/applicator on as needed basis, as a cost saving measure.

Because of the District's proactive approach in dealing with AIS, the current populations of CLP and EWM within the Flowage are dwindling while native plants are reestablishing in numbers and diversity, improving the health and use opportunities of the White River Flowage. However, the White River Flowage Lake Management District should continue to be involved in some type of aquatic plant management program or plan to help manage nuisance aquatic plant growth of EWM and CLP posing recreational hazards to riparian property owners and visitors. EWM and CLP are opportunistic plants and can grow to nuisance levels in a very short period of time. Continued management should occur to ensure the health, aesthetic and recreational value of the lake is not degraded.

The White River Flowage Lake Management District must remain proactive in there approach. With the Department's continued commitment to ensuring the health, aesthetic and recreational values of the White River Flowage are preserved with active aquatic plant management, the quantity of nuisance aquatic plant growth and exotic species such as EWM and CLP found on the White River Flowage will be appropriately controlled.

Stantec appreciates working for the Association this past treatment season and we look forward to working with you on future projects. Please feel free to contact Stantec at (920) 324-8600 if you have any questions regarding the 2011 chemical treatment or with additional questions or concerns.

Respectfully,

STANTEC CONSULTING SERVICES INC.

James T. Scharl

Graduate Scientist/WI Licensed Applicator

Tel: 920-324-8600 Fax: 920-324-3023

Email: james.scharl@stantec.com

Attachments



FIGURES

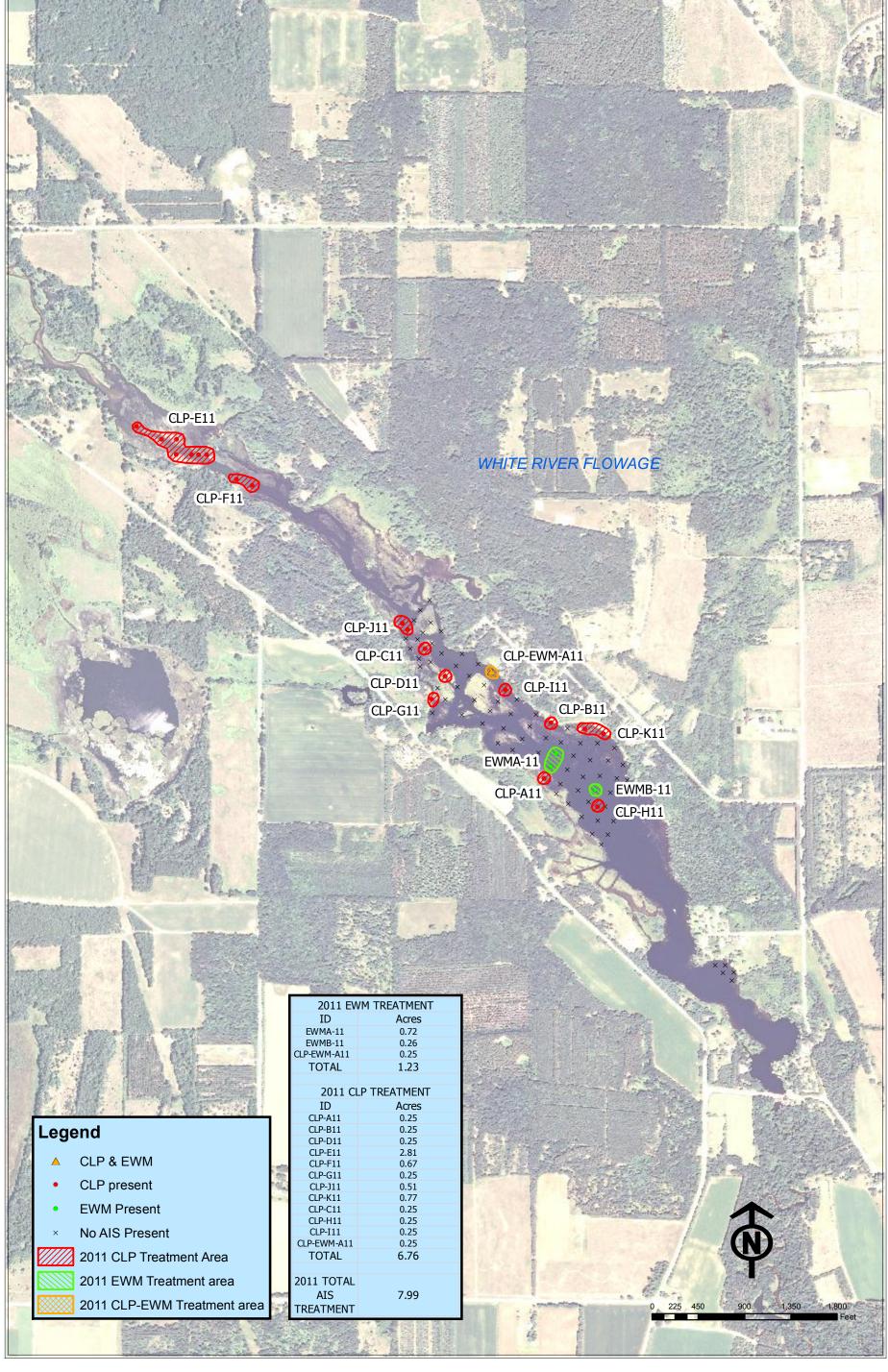
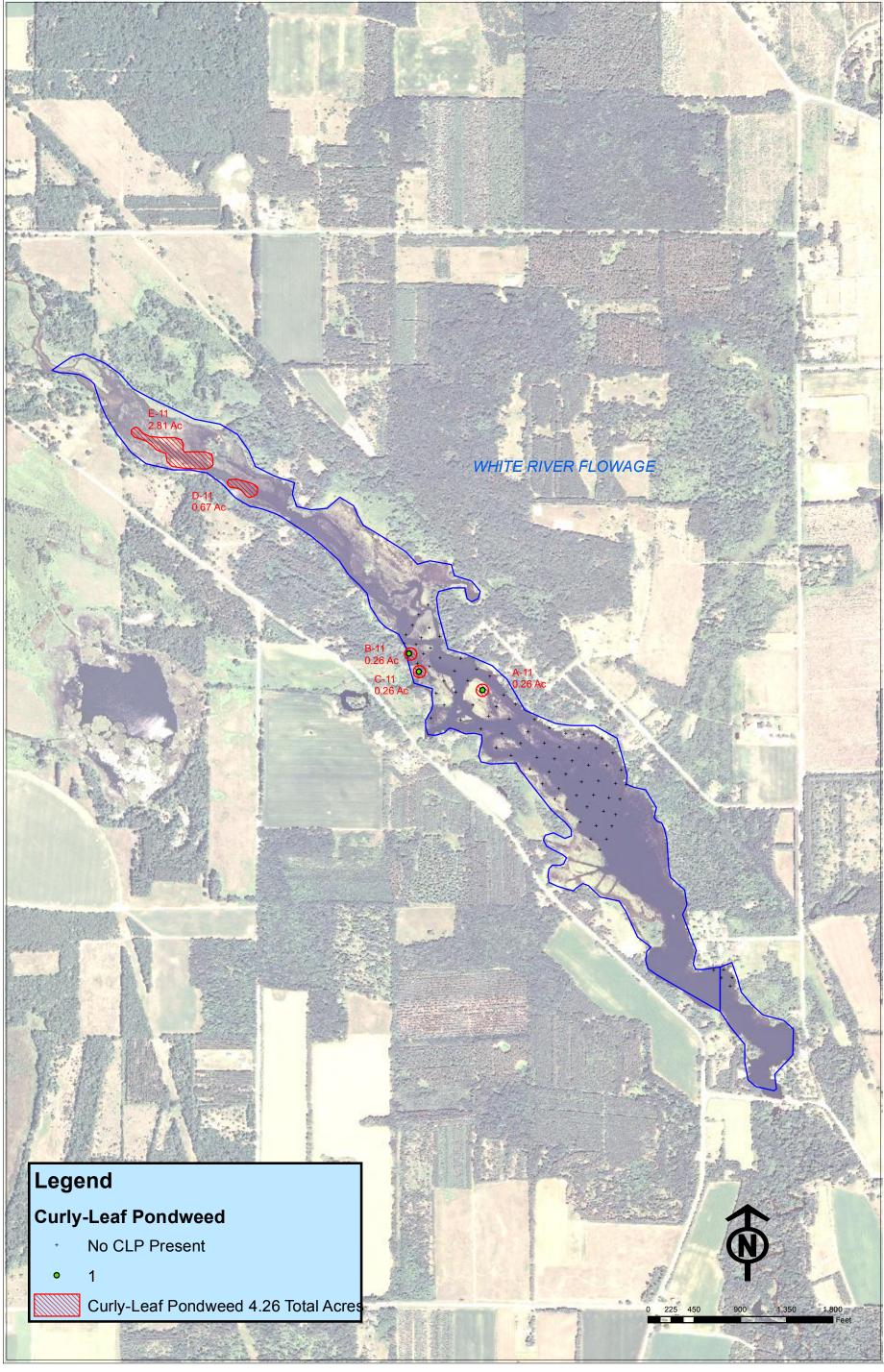


FIGURE 1 4411-11003-0



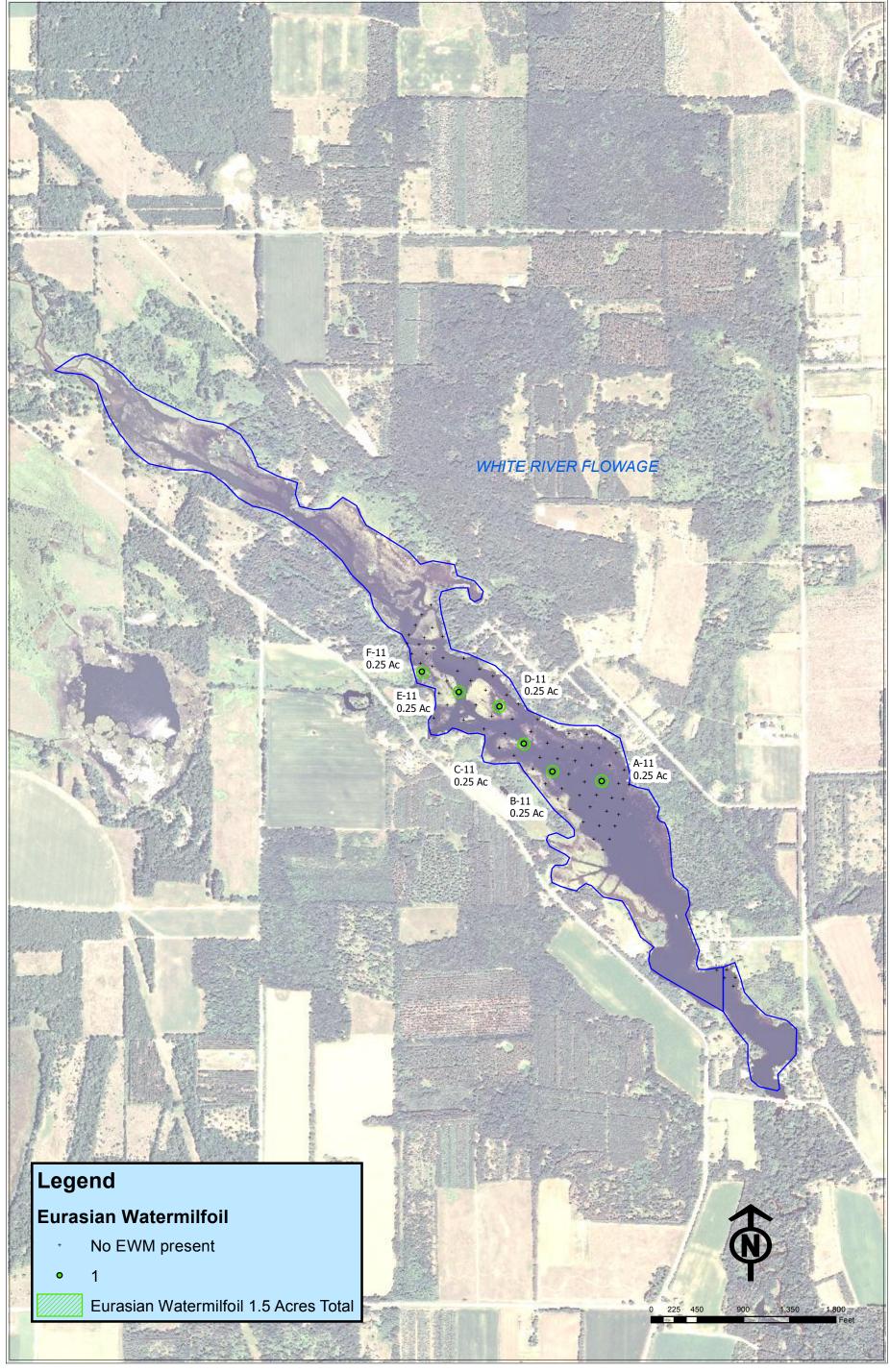


2011 AIS POST TREATMENT SURVEY

WHITE RIVER FLOWAGE WAUSHARA COUNTY, WISCONSIN

FIGURE 2 4411-11003-0 DATE OF SURVEY: 7/16/2011





2011 AIS POST TREATMENT SURVEY

WHITE RIVER FLOWAGE WAUSHARA COUNTY, WISCONSIN

FIGURE 3 4411-11003-0 DATE OF SURVEY: 7/16/2011





ATTACHMENT A

WDNR Chemical Aquatic Plant Control Permit

State of Wisconsin Department of Natural Resources
Aquatic Plant Manager dnr.wi.gov

Chemical Aquatic Plant Control Application and Permit

Form 3200-004 (R 6/05)

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DNR Use Only D Number Permit Expiration, Date

Notice: Use of this form is required by the Department for any application filed pursuant to s. 281.17(2), Wis. Stats., and Chapter NR 107, Wis. Adm. Code. The Department will not consider your application unless you complete and submit this application form. Personally identifiable information on this form may be provided to requesters as required by Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.].

opon records and test reserves	1	11/6/.
Section I – Applicant Information		<u> </u>
Name of Permit Applicant. Also indicate names and addresses of all individuals Attach additional sheets if necessary.	s, associations, communities or town:	sanitary districts sponsoring treatment.
Name	Name SHITE RIVER FLO	DUNGE LAKE MOT. DISTR
Street or Route Street or Route Fire Number	Street or Route WAY WAY TE RO	PLANCE LOKE MOST. VISTAC Fire Number VER TYC. State ZIP Code
City State ZIP Code	e WOXI W/7//E/SC	State ZIP Code
W1 53963	WAUTOMA	WI 54982
Telephone Number (include area code)		il Address
Home: Business: 970_374-8600 Lake	e: <i>[=13</i> ,	IGGIGKACENTURYTEL . NIET
Section II - Aquatic Plant Control Location		
Waterbody to be Treated (waterbody where treatment area is located)		stimated Surface Area that is 10 Feet or ess in Depth
WHITE KIVEK FLOWAGE	/ 2.3 acres	11.3 acres
	Adjacent Riparian Property Owner Na	imes (attach sheets if necessary)
UNUSHAKA 13,14,24 I8 N 10 □W Name of Applicator or Firm	1. Jee 1011/30	71-1/
O .	2	
Street or Route	3	
1203 STORBECK OR.	4	•
City State ZIP Code	5	
WAUDON WI 53963	6	
Telephone Number (include area code)	7.	
Home: 920-324-8600 Business: 800-498-3921		ciation Representative or Lake District
Email Address	Representative (if none, please indicate	
A. U. d. O. J.S. J. N. N. J. G. O. C. S. A. J. D. Girle D. G. A. J.	WHITE RIVER FLOWDER	Certification Expiration
Applicator Certification Number for Category 5 Aquatic Pesticide Application		Certification Expiration
077803 Business Location License Number (if applicable)	Date Verified w/ DATCP	Certification Expiration
93 - 013597 - 010827	bate verified w/ DATCP	Cerumodachi Expirationi
Restricted Use Pesticide License Number (if applicable)	Date Verified w/ DATCP	Certification Expiration
	۵	
Area(s) Proposed for Control (Note details in permit cover letter for fin	al permitted sizes of treatment are	eas.)
A. Shoreline Lengthft. X Distance From Shoreft.	+ 43,560 ft. = Estimated	d Acreage. Average Depth ft.
B. Shoreline Length ft. X Distance From Shore ft.		
C. Shoreline Length ft. X Distance From Shore ft.		
D. Shoreline Length ft. X Distance From Shore ft.		
E. Shoreline Lengthft. X Distance From Shoreft.		d Acreage. Average Depth ft.
	ated Acreage 7.9	
If the estimated acreage is greater than 10 acres, or is greater than 10 complete and attach Form 3200-004A, Large-Scale Treatment Worksl		
Is this area within or adjacent to a sensitive area designated by the De		Yes No
	partinent of Natural Resources?	ON EM Set
All II Decision Co. Co. December		

Chemical Aquatic Plant Control Application and Permit

Form 3200-004 (R 6/05)

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Se	ction III - Fees
1.	s. NR 107.11(1), Wis. Adm. Code, lists the conditions under which the permit fee is limited to the \$20 minimum charge.
	s. NR 107.11(4), Wis. Adm. Code, lists the uses that are exempt from permit requirements.
3.	s. NR 107.04(2), Wis. Adm. Code, provides for a refund of acreage fees if the permit is denied or if no treatment occurs.
4.	Fee calculations: Basic Permit Fee (non-refundable)
	If proposed treatment is over 0.25 acre, calculate acreage fee: (round up to nearest whole acre, to maximum of 50 acres.)
	9.9 acres X \$25 per acre = \$ 247.50
	If proposed treatment is ≤ 0.25 acre, acreage fee is \$0.
	Enter Acreage Fee (from above)
	Total Foo Englosed

Please include a sketch and/or a printed map of lake indicating area and dimensions of each individual area where plant control is desired. Also show location of property owners riparian to and adjacent to the treatment area. You may use the space below to sketch a map. Attach a separate list of owners and corresponding treatment dimensions coded to the lake map, if necessary.



Chemical Aquatic Plant Control Application and Permit

Form 3200-004 (R 6/05)

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Section IV - Reasons for Aquatic Plant C	ontrol						
Goal of Aquatic Plant Control:		Nuisano	e Caused By:				
Reduce nuisance algae accumulation			Algae				
Maintain navigational channel for common use Maintain private access for boating			Emergent water plants (majority of leaves and stems growing above water surface, e.g. cattails, bulrushes)				
Maintain private access for fishing Improve swimming Control of purple loosestrife			Floating water plants (majority of leaves floating on water surface, e.g., waterlilies, duckweed) Submerged water plants (leaves and stems below water surface, flowering parts may be exposed, e.g., milfoil, coontail)				
INFESTATION OF EWI	n Ano CCP		Other:				
List Target Plants		Note: E	Different plants require different chemicals for effective				
TARGET Species:		t	reatment. Do not purchase chemical before identifying plants.				
EURASIAN WAT	ERMILFO	ic Cm;	PRISPHYCLUM SPICATOM) (EWM)				
Cunly LEAF P	DADWEED (POTAM	OGETON SPICATOM) (EWM)				
•			, ,				
Section V – Chemical Control							
Alternatives to Chemical Control:	Feasible		If No, Why Not?				
Mechanical harvesting	1. T.	⊠ No	Sprenos Plant PEBRIS & CONT GET INTO SHOWS				
2. Hand pulling		No	Too LABOR INTERSIVE				
3. Hand raking		IX No	1c 6 1/				
4. Hand cutting	Yes	⊠ No	4 4 W				
5. Sediment screens/covers	Yes	No	NOT EFFECTIVE				
6. Dredging	Yes	⊠ No	Too Costly				
7. Lake drawdown	Yes	No	NOT A CONTROL OPPION				
8. Nutrient controls in watershed	Yes	⊠ No	for the firm to				
9. Other:	Yes	No					
Note: If proposed treatment involves mu			feasibility of EACH alternative for EACH property owner.				
If you checked yes to any of the alternatives							
T - 1 N - 10							
Trade Name of Proposed Chemical(s) Agonthor K (Ligora), MacA Method of Application	тисс Борск	e K Ca	ESMULAR)-CLP, NAVIGATE & - EWM				
Ä .	LICATION	C					
Which chemicals or other control options have	ve been tried befo	ore on the	proposed site, and what were the results?				
THESE CHEMICALS HAVE THE TARGET INVASIVES PO IN THE PAST.	r Been U Lesant Had	SED ST VE BEC	ATT WIDE TO CONTROL BOTH CLP AND FWM. IN CONTROLLED BY BORESTROD SUCCESSFULLY				

Note: Chemical fact sheets for aquatic pesticides used in Wisconsin are available from the Department of Natural

Chemical Aquatic Plant Control Application and Permit

Form 3200-004 (R 6/05)

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Section VI - Applicant Responsibilities and Certification

- 1. The applicant has prepared a detailed map which shows the length, width and average depth of each area proposed for the control of rooted vegetation and the surface area in acres or square feet for each proposed algae treatment.
- 2. The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management project involving chemicals. Under s. NR 107.07, Wis. Adm. Code, supervision may include inspection of the proposed treatment area, chemicals and application equipment before, during or after treatment. The applicant is required to notify the regional office 4 working days in advance of each anticipated treatment with the date, time, location and size of treatment unless the Department waives this requirement. Do you request the Department to waive the advance notification requirement?
- 3. The applicant agrees to comply with all terms or conditions of this permit, if issued, as well as all provisions of Chapter NR 107, Wis. Adm. Code. The required application fee is attached.
- 4. The applicant has provided a copy of the current application to any affected property owners' association, inland lake district and, in the case of chemical applications for rooted aquatic plants, to all owners of property riparian or adjacent to the treatment area. The applicant has also provided a copy of the current chemical fact sheet for the chemicals proposed for use to any affected property owner's association or inland lake district.

owner's association or inla	nd lake district.						
I hereby certify that the appropriate particular of Applican	the above information is true and correct and that copies of this application have been provided to say named in Section II and that the conditions of the permit and pesticide use will be adhered to. Date Signed						
All portions of this permit, map and accompanying cover letter must be in possession of the chemical applicator at time of treatment.							
During treatment all provisions of Chapter NR 107, specifically ss. NR 107.07 and NR 107.08, Wis. Adm. Code, must be complied with, as well as the specific conditions contained in the permit cover letter.							
well as the specific conditions	contained in the permit cover retter.						
Section VII - Permit to Carry	Out Chemical Treatment (Leave Blank – DNR Use Only)						
The foregoing application is a application during the season	oproved. Permission is hereby granted to the applicant to chemically treat the waters described in the of 20//						
Application fee received?	State of Wisconsin						
Yes No	Department of Natural Resources For the Secretary						
Advance notification of	By Chut + waster						
treatment required?	Regional Director or Designee						
Yes No	Date Signed Date Mailed						

Please Note:

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to s. 227.48(2), Wis. Stats.

To request a contested case hearing pursuant to s. 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.



ATTACHMENT B

AQUATIC PLANT MANAGEMENT HERBICIDE TREATMENT RECORDS

State of Wisconsin Department of Natural Resources

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (5/01) Page 1 of 2

NOTICE: Completion of this form is a condition of the permit and provides records required by WDNR (NR107) and DATCP (ATCP 29.21 and 29.22). The Department may not issue you future permits unless you complete and submit this form. Personally identifiable information required on this form is not likely to be used for purposes other than that for which it is originally being collected. It may also be made available to requesters under Wisconsin's Open Records Law [ss. 19.31 – 19.39, Wis. Stats.]

Submit this form: (1) immediately if any unusual circumstances occurred during treatment

- (2) as soon after treatment as possible, no later than 30 days
- (3) by October 1 if no treatment occured

Completion of this form along with the permit satisfies the requirements of WDNR (NR107) and DATCP (ATCP29.21 and 29.22).

General Permit Information									
Permit Number									
NER-11-016-70 White River Flowage									
County Permit Holder Name									
Waushara		Bone	estroo, Inc.						
Treatment Information									
Treatment Date	Starting Time (2	4 hr) Ending Time (24 hr) Water Temp (°F) Ambient Air Temp (°F) Wind Spe					peed (mph)	Wind Direction	
05/17/11 14:30		17:00		61° F	60° F		5-10		E-SE
Other Conditions Noted	(i.e., dead fish, s	pawning	g fish, algae bloom, etc	.)					
None									
Onsite Supervision Present?									
Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)									
Prepackaged Retail Cor	ntainers								
Herbicide Treatment and	d Water Use Res	triction	Signs Posted In Accord	lance With NR 107?	X Ye	es 🗌 No			
Applicator shall provide each customer with a free copy of each pesticide label used (if requested)									
Applicator Informati									
Individual Business Nan	ne						Telepho	ne Number	
Bonestroo, Inc.							920-3	24-8600	
Street Address									
1203 Storbeck Dr	rive								
City					State	Zip Code			
Waupun					WI	53963			
Individuals Making Pest	icide Application:	: Last Name First				Cert	ification #		
		Scl	harl	James				077	7803
		Las	t Name	First				Cert	ification #
		We	endt	Vincent				082	2129
Last Name First					Certification #				
Name of Person Completing Form			Signature James Amus		Date Signed	Date Signed			
James T. Scharl				neg mod	05/21/11				

Aquatic Plant Management Herbicide Treatment Record

Aguathol Super K #4581-388-82695

106 lbs

Form 3200-111 (5/01) Page 2 of 2

Treatment Site and Chemical Information (use attached additional site / herbicide sheet if necessary) Amount Treated Treated Permitted **GPS Location** Applied Shoreline Herbicide(s) Used / Distance Treated Acreage Sensitive (e.g., gals, Latitude / Site No. Property Name, Address / Fire No. Length (ft) Off Shore Acreage (per property) Area: EPA Reg. Number(s) lbs) Longitude Aquathol K #4581-204-82695 0.75 gal CLP-A 0.25 0.25 $\prod Y$ CLP-B \square Y 0.75 gal 0.25 0.25 Aquathol K #4581-204-82695 CLP-C 0.25 0.25 \square Y Aguathol K #4581-204-82695 0.75 gal CLP-D 0.25 0.25 $\prod Y$ Aquathol K #4581-204-82695 0.75 gal Aguathol Super K #4581-388-82695 CLP-E 2.81 2.81 $\prod Y$ 86 lbs CLP-F □ Y 0.67 0.67 Aquathol Super K #4581-388-82695 20 lbs CLP-G 0.25 0.25 $\prod Y$ Aquathol K #4581-204-82695 0.75 gal CLP-H 0.25 0.25 □ Y Aquathol K #4581-204-82695 0.75 gal CLP-I 0.25 0.25 □ Y Aquathol K #4581-204-82695 0.75 gal □ Y Aquathol K #4581-204-82695 CLP-J 0.51 0.51 1.5 gal □ Y Aquathol K #4581-204-82695 CLP-K 0.77 0.77 2.5 gal EWM-A 0.72 0.72 $\prod Y$ Navigate #71368-4-8959 144 lbs ☐ Y EWM-B 0.26 0.26 Navigate #71368-4-8959 50 lbs Navigate #71368-4-8959 50 lbs CLP-EWM-A 0.25 □ Y 0.25 Aquathol K #4581-204-82695 0.75 gal 244 lbs Navigate #71368-4-8959 **TOTAL** 7.99 9.9 □ Y Aguathol K #4581-204-82695 10 gal

Sheet 2 of 2

Date: May 21, 2011