



## Memorandum

December 30, 2008

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RE: Stipulation Monitoring Results – Flambeau Mining Company

### Introduction

Foth Infrastructure & Environment, LLC (Foth) has prepared a summary of field events and analytical results of monitoring conducted during 2008 in accordance with item Number 6 of the May 31, 2007 Stipulation Agreement.

Soil, sediment, biota, and surface water sampling results are summarized by the following areas:

- ♦ Stream A (SW-A1),
- ♦ Stream B (SW-B1),
- ♦ Stream C (S-C1, S-C2, SW-C1, SW-C3, SW-C8),
- ♦ 1.7-acre constructed wetland (SED-MSBF-1, SED-MSBF-2, SED-MSBF-3, SED-MSBF-4, SED-MSBF-5, SED-MSBF-6),
- ♦ Flambeau River (SW-1, SW-2, SW-3, S-1, S-3, S-4),
- ♦ Reclaimed Flambeau Mine (S-SS-MS-01, S-SS-MS-02, S-SS-MS-03, S-SS-MS-04, S-SS-MS-05),
- ♦ H & H Building (S-SS-HH-1, S-SS-HH-2, S-SS-HH-3, S-SS-HH-4, S-SS-HH-5),

- ♦ 0.9-acre biofilter (S-IOBF-7, S-IOBF-8, S-IOBF-9, S-IOBF-10, S-IOBF-11, S-IOBF-12),
- ♦ Walleye (F-1, F-2)
- ♦ Crayfish (M-1, M-2, M-3)

Methodology and results of 2008 stipulated monitoring events are summarized below.

Lab data has been provided to the parties to the stipulation in correspondence from Flambeau Mining Company (Flambeau) on July 23, 2008, October 13, 2008, December 8, 2008 and December 9, 2008.

## **Methods**

### **Surface Water Monitoring**

Surface water sampling was conducted at three points where focused runoff leaves the mine site as well as at locations SW-C3 (located east of Highway 27 north of the rail spur) and SW-C8 (part of the biofilter management sampling plan). The focused runoff surface water sample locations were where Stream A leaves the mine site (SW-A1), Stream B near the outlet of the 1.7 acre constructed wetland (SW-B1), and Stream C downstream of the crossing at Copper Park Lane (SW-C1). Surface water sampling locations are identified in Figure 1.

Surface water sampling was also conducted at three points within the Flambeau River – upstream from the mine site at the end of Blackberry Lane, approximately 100 yards downstream from the former Outfall 001, and at a point below the mouth of Stream C but above the mouth of Meadowbrook Creek. Figure 1 identifies sample locations.

The grab surface water samples were analyzed for sulfate, copper, iron, manganese, zinc, total hardness, and field pH and field conductivity. An estimate of flow data (qualitative or quantitative) was also recorded. Table 1 contains a field data summary and Table 2 contains a monitoring summary.

Surface water samples could not be obtained at SW-A1, SW-B1, SW-C3 or SW-C8 during the fall because there was not enough precipitation to cause flow at these locations.

### **One-Time Sediment Sampling (0.9 acre Biofilter, 1.7 Acre Constructed Wetland, Stream C, and Flambeau River)**

Sediment samples were collected in the 0.9 acre biofilter, 1.7 acre constructed wetland, Stream C, and the Flambeau River in mid summer 2008, six individual samples were taken in the 0.9 acre biofilter, six individual samples in the 1.7 acre constructed wetland, two samples in Stream C, and three samples in the Flambeau River. The 0.9 acre biofilter and 1.7 acre constructed wetland were sampled using sediment probes. Sediment samples from Stream C were collected using a hand trowel to dig below ground surface due to dry conditions in the stream bed. The Flambeau River samples were collected using sediment traps.

Sediment probing was performed to measure the thickness of the soft sediment within a particular area or location, prior to core sample collection. The purpose of sediment probing and probing is to accurately measure soft sediment thickness. Sediment thickness measurements

were conducted by setting a calibrated rod with a plate on the end, on top of the soft sediment. The calibrated rod was then advanced through the soft sediment materials until refusal. The difference between the initial depth measurement and depth of refusal is the sediment thickness. Sediment core logs are provided in Attachment 1.

Sediment core samples were collected by pushing a core into the soft sediment until refusal. Sediment core samples were processed based on field observation and samples representing recently deposited sediment and were sent to an analytical laboratory to be analyzed for copper, iron, manganese, and zinc. Six cores were pushed in the 1.7 acre constructed wetland at locations shown on Figure 2 and submitted individually for analysis. In the 0.9 acre biofilter six cores were pushed at locations shown on Figure 2 and submitted individually for analysis. Results of the core sampling are provided in Table 3.

The upstream location (S-1) on the Flambeau River is at the end of Blackberry Lane. The downstream location (S-3) on the Flambeau River is downstream from where Stream C and Meadowbrook Creek empty into the Flambeau River and is adjacent to the Sister's Farm Recreation Area. A third sample location (S-4) was collected at a point below the mouth of Stream C but above the mouth of Meadowbrook Creek. All locations are shown on Figure 2. Results of the river sediment sampling are provided in Table 3.

The Stream C locations for sediment collection were based on the hydrology, deposition of the stream, and field observation. One location was downstream from the overflow of the 0.9 acre biofilter and approximately 20 yards south of Copper Park Lane where Stream C is a gaining stream, in an area of sediment deposition. The other location was approximately 120 yards downstream of Copper Park Lane, where Stream C is a losing stream, in an area of deposition. Stream C sample locations are identified in Figure 2. Results of the Stream C sediment sampling are provided in Table 3.

#### **One-Time Soil Sampling – H&H Building, Mine Site**

Soil samples were collected from five locations in the H&H building area and five representative locations on the mine site. The samples were collected to a depth of 4 inches. This sampling was a one-time sampling event occurring in 2008. Each sample consisted of four sub-samples which were collected using a hand trowel. A pick was used when consolidated material needed to be broken up. Each of the four sub-samples was then composited into one sample.

The five H&H building area sample locations were pre-determined prior to work being completed. Soil sample locations for the H&H building area are identified in Figure 2. These locations were chosen based on use of the site during mining and were placed where impacts due to vehicle traffic may be the largest.

The soil samples collected from the five general mine site locations consisted of a composite of four soil grab samples collected to a depth of 4 inches from the general area of the five soil sample locations for the mine site. These five general locations are identified in Figure 2. These locations were chosen based on the use of the site during mining and the current watersheds across the mine site to allow for sampling downslope of previously heavily used areas.

Soil samples were analyzed for copper, pH (lab), and sulfide. Analytical results of the soil sampling are provided in Table 3.

### Walleye Sampling

Acceptable sampling methods for fish collection include hook and line, electrofishing, and fyke netting. Consistent with previous years during active mining, electrofishing was used for the collection of walleye. Walleye in the following size ranges were targeted for collection:

- 10 to 12 inches - one fish
- 12 to 15 inches - two fish
- 15 to 18 inches - three fish
- 18 to 22 inches - two fish
- > 22 inches - one fish

Electrofishing was conducted on the Thornapple Flowage on September 9, 2008 and on the Ladysmith Flowage on September 8, 2008. Approximately 30% of the workable shoreline of the Thornapple Flowage was sampled (3.25 hours of energized time). Weather conditions during the collection period included a clear sky with temperatures in the low 40's (°F). Water conditions included a temperature of 19.2°C, dissolved oxygen of 9.2 mg/L, and specific conductance of 137 (µS). Walleye sampling locations are identified in Figure 3.

Approximately 45% of the workable shoreline of the Ladysmith Flowage was sampled (5.6 hours of energized time). Weather conditions during the collection period included a clear sky with temperatures in the mid 40's (°F). Water conditions included a temperature of 20.1 °C, dissolved oxygen of 9.7 mg/L, and specific conductance of 132 µS.

During each of the collection efforts, observed fish species were recorded. A fish species inventory is located in Table 4. As in previous years, fish in the largest walleye size class were not obtained from the Ladysmith Flowage. Therefore, in the Ladysmith Flowage, fish collected in the next lower size class were substituted for the largest size. In 2008 all fish of the intended size were obtained from the Thornapple Flowage.

Walleye which met the criteria for length were set aside in tubs of ice water for further processing. Walleye were measured for length, filleted, and certain organs were extracted for analysis. Scales of each walleye were extracted for aging as were dorsal spines on the largest walleye. Physical Walleye data is listed in Table 5.

Walleye livers once processed were placed on ice for transport to Northern Lake Service, Crandon, Wisconsin, for analysis. Walleye stomachs were retained by Foth for analysis. Individual walleye stomachs were extracted and preserved in formalin, the contents of which were analyzed on an individual basis, results are located in Table 6. The livers from each of the nine walleye from a single flowage were composited into a single sample for analysis. Livers were analyzed for copper, manganese, iron, and zinc in accordance with the Stipulation, analytical results for metals are found in Table 7.

### **Crayfish Sampling**

Crayfish were collected similarly to collection activities which were conducted during the active phase of the Flambeau Mining operation. As in previous collection efforts, the purpose of the crayfish collection was to conduct metals analysis of crayfish at selected sites upstream and downstream of the now reclaimed Flambeau Mine Site. Between 25 and 30 crayfish were collected at each of the following sites, which are shown on Figure 3.

- ♦ The Flambeau River at the Blackberry Lane access (upstream site)
- ♦ The Flambeau River at Meadowbrook Creek (downstream site) immediately above Meadowbrook Creek and adjacent to the confluence with Stream C
- ♦ The Flambeau River at the site of the former Port Arthur Dam (downstream site)

All samples were collected using an 8 by 18 inch rectangular net with 800 to 900 micron mesh size. Crayfish were collected by using a kick seine method.

Specimens were composited for each site in a Ziploc bag and placed on ice. Analytical results, collection times, and quantities are provided in Table 8. Specimens were transported to Northern Lake Service, Crandon, Wisconsin for metals analysis (copper, iron, manganese, and zinc).

### **Results**

The following sections discuss the results by area of sampling complete in 2008.

#### **Stream A**

Surface water sample SW-A1 is shown on Figure 1. Total copper was present in surface water at SW-A1 was estimated at 3.5 micrograms/liter ( $\mu\text{g}/\text{l}$ ) in April 2008. No sample was collected during the Fall sampling due to insufficient water.

#### **Stream B**

Surface water sample SW-B1 is shown on Figure 1. Total copper present in surface water at SW-B1 was 4.5  $\mu\text{g}/\text{l}$  in April 2008. No sample was collected during the Fall sampling due to insufficient water.

#### **Stream C**

Stream C sample locations S-C1, S-C2, SW-C1, SW-C3, and SW-C8 were sampled as part of the stipulated monitoring and are shown on Figures 1 and 2. Sediment samples were collected from locations S-C1 and S-C2. The copper concentration at S-C1, near Copper Park Lane, was 180 milligrams/kilogram ( $\text{mg}/\text{kg}$ ). The copper concentration at S-C2 was 7.2  $\text{mg}/\text{kg}$ . Surface water was collected from SW-C1, SW-C3, and SW-C8. Total copper in surface water ranged from 27 to 33  $\mu\text{g}/\text{l}$  on April 25, 2008. These locations were resampled on June 8, 2008 and total copper values ranged from 32 to 100  $\mu\text{g}/\text{l}$ . Samples could not be collected at SW-C3 or SW-C8 during the fall sampling due to insufficient water. The copper concentration at SW-C1 was 77  $\mu\text{g}/\text{l}$  on October 27, 2008.

### **1.7-Acre Constructed Wetland**

1.7-acre constructed wetland sediment sample locations, SED-MSBF-1 through SED-MSBF-6, are shown on Figure 2. Copper concentrations in sediment cores collected within the 1.7-acre constructed wetland ranged from 28 to 71 mg/kg. The wetland acts as a natural filter concentrating and containing sediment within the wetland and preventing movement of sediment.

### **Flambeau River**

Flambeau River surface water and sediment locations SW-1, SW-2, SW-3, S-1, S-3, and S-4 are shown on Figures 1 and 2. Copper concentrations in sediment ranged from 8.6 mg/kg to 24 mg/kg. Total copper concentrations in surface water ranged from an estimated 2.8 µg/l to 5.6 µg/l in April 2008 and an estimated 1.8 µg/l to an estimated 2.7 µg/l in October 2008.

### **Reclaimed Flambeau Mine**

Sample locations S-SS-MS-01, S-SS-MS-02, S-SS-MS-03, S-SS-MS-04, and S-SS-MS-05 are shown on Figure 2. Copper concentrations in soil ranged from 7.8 mg/kg at S-SS-MS-01 to 13 mg/kg at S-SS-MS-04.

### **H & H Building**

Sample locations S-SS-HH-1, S-SS-HH-2, S-SS-HH-3, S-SS-HH-4, and S-SS-HH-5 are shown on Figure 2. Copper concentrations in soil at these locations ranged from 54 mg/kg at S-SS-HH-5 to 290 mg/kg at S-SS-HH-4. Values at locations S-SS-HH-1, S-SS-HH-2, S-SS-HH-3, and S-SS-HH-5 were all equal to or less than 76 mg/kg. Location S-SS-HH-4 was located in a low area which does not appear to drain significantly towards the Highway 27 ditch line. Surrounding surface water results show the soil at the H&H Building is not adversely affecting the quality of stormwater runoff discussed in the October 14, 2008 submittal "2008 Monitoring Results and Copper Park Lane Work Plan".

### **0.9-Acre Biofilter**

Sample locations BFSW-C1, BFSW-C2, S-IOBF-7, S-IOBF-8, S-IOBF-9, S-IOBF-10, S-IOBF-11, and S-IOBF-12 are shown on Figure 2. Copper concentrations in the sediment of the biofilter ranged from 360 mg/kg at S-IOBF-12 and 2100 mg/kg at S-IOBF-9.

### **Walleye**

The physical data of the walleye collected for analysis is provided in Table 4. Total species of fish observed and their relative abundance are provided in Table 5. An analysis of the stomach contents of the walleye is provided in Table 6. Analytical results of fish livers are provided in Table 7.

### **Crayfish**

Water levels in the Flambeau River during which the crayfish were collected were considered low. Water level in the river on the day of collection was several inches below bank stage at Blackberry Lane and Meadowbrook Creek to about bank stage at Port Arthur Dam. Water stage will normally fluctuate one to two feet during the day when water is discharged for power generation at the Ladysmith Dam. Water temperature during the collection was 20.1 °C at Blackberry lane, 19.5 °C at Meadowbrook Creek and 19.6 °C at Port Arthur Dam.

A crayfish sampling inventory is shown in Table 8. The results of the analysis of the crayfish appear in Table 9. The results represent a composite from all crayfish collected per site. Whole bodies were used for analysis.

### **Conclusion**

Based on the results of the 2008 stipulated sampling, water quality leaving the site has not had a significant adverse impact to offsite areas or reclaimed areas of the mine.

## Tables



**Table 1**  
**2008 Surface Water Field Data**  
**Flambeau River, Ladysmith, Wisconsin**

Location	Lat.	Long.	Sample Date	pH S.U.	Cond. $\mu\text{s}/\text{cm}$	Temp $^{\circ}\text{C}$	Flow	Notes
<b>Spring 2008</b>								
SW-C8	91° 6.7	45° 26.3	04/25/08	6.1	422	12.4	High	
SW-A1	91° 7.2	45° 26.6	04/25/08	6.8	83	12.2	High	
SW-B1	91° 7.3	45° 26.4	04/25/08	6.8	53	13.0	High	
SW-C1	91° 6.8	45° 26.2	04/25/08	6.3	93	11.2	High	
SW-1	91° 7.7	45° 26.8	04/25/08	7.2	63	8.9	High	
SW-2	91° 7.2	45° 26.2	04/25/08	7.0	63	9.2	High	
SW-3	91° 7.1	45° 26.0	04/25/08	6.7	86	11.5	High	
SW-C3	91° 6.6	45° 26.3	04/25/08	6.1	28	10.8	High	
SW-C3	91° 6.6	45° 26.3	06/08/08	6.0	28	16.0	Moderate	
SW-C1	91° 6.8	45° 26.2	06/08/08	6.3	71	17.6	Mod - High	
SW-C8 <sup>2</sup>	91° 6.7	45° 26.3	06/08/08	6.2	203	18.2	Low	Ditch Full; Low Flow Velocity Observed
<b>Fall 2008</b>								
SW-C1	91° 6.8	45° 26.2	10/27/08	6.5	145	6.5	Low	
SW-1	91° 7.7	45° 26.8	10/27/08	8.7	150	8.1	Low - Normal	
SW-2	91° 7.2	45° 26.2	10/27/08	8.6	147	8.6	Low - Normal	
SW-3	91° 7.1	45° 26.0	10/27/08	8.7	145	8.7	Low - Normal	

Prepared by: GJP  
Checked by: SVF

Notes:  
<sup>1</sup> = All locations were surveyed during the spring 2007 event except SW-A1 and SW-C3 which were surveyed during the spring 2008 event.  
<sup>2</sup> = Location SW-C8 also sampled as part of the Biofilter Management Sampling Plan.

Lat. = Latitude  
Long. = Longitude  
Cond. = Conductivity  
 $\mu\text{s}/\text{cm}$  = microsiemens per centimeter  
S.U. = Standard Unit  
 $^{\circ}\text{C}$  = Degrees Celsius

**Table 2**  
**Surface Water Sampling Analytical Results**

**Spring 2008**

		Sample ID	SW-1	SW-2	SW-3	SW-A1	SW-B1	SW-C1	SW-C1	SW-C3	SW-C3-Dup	SW-C3	SW-C8	Dipper Blank
		Collection Date	4/26/2008	4/26/2008	4/26/2008	4/26/2008	4/26/2008	4/26/2008	6/8/2008	4/26/2008	4/26/2008	6/8/2008	6/8/2008	4/26/2008
		Area	Flambeau River	Flambeau River	Flambeau River	Stream A	Stream B	Stream C	Stream C	Stream C	Stream C	Stream C	Stream C	QC
		Sample Depth	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Parameter	Units	Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Deionized Water
Conductivity, lab	umho@25C		71	70	75	93	59	103	73	31	33	29	22	
Copper, tot	ug/L		4.4	2.8 J	5.6	3.5 J	4.5	27	32	6.9	7.7	9	100	< 1.3
Hardness, tot	mg/L		28	27	25	18	22	21	16	11	11	13	12	< 1.0
Iron, tot	mg/L		0.78	0.72	0.77	1.1	0.69	0.83	1.1	0.72	0.76	1.1	2.4	< 0.033
Manganese, tot	mg/L		96	88	82	81	27	20	38	25	24	45	79	< 1.0
pH, Lab	s.u.		7.53	7.54	7.46	7.37	7.49	7.1	6.7	6.92	6.44	6.62	7.1	5.9
Sulfate, as SO4 (unfiltered)	mg/L		4.7 J	4.9 J	4.7 J	< 2.5	3.5 J	4.5 J	3.7 J	3.3 J	3.2 J	2.6 J	3.6 J	< 0.25
Zinc, tot	ug/L		8.5 J	5.5 J	11	7.3 J	< 5.0	63	44	9.2 J	10	10	36	< 5.0

**Fall 2008**

		Sample ID	SW-1	SW-1 Dup	SW-2	SW-3	SW-C1
		Collection Date	10/27/2008	10/27/2008	10/27/2008	10/27/2008	10/27/2008
		Area	Flambeau River	QC	Flambeau River	Flambeau River	Stream C
		Sample Depth	NA	NA	NA	NA	NA
Parameter	Units	Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Conductivity, lab	umho@25C		157	157	154	146	168
Copper, tot	ug/L		1.6 J	2.2 J	1.8 J	2.7 J	77
Hardness, tot	mg/L		56	58	57	56	26
Iron, tot	mg/L		0.23	0.24	0.22	0.21	2.6
Manganese, tot	mg/L		46	48	48	45	250
pH, Lab	s.u.		8.34	8.32	8.26	8.25	6.67
Sulfate, as SO4 (unfiltered)	mg/L		9.5	9.8	9.4	9.7	15
Zinc, tot	ug/L		6.1 J	5.5 J	6.9 J	6.4 J	76

**Notes:**

- During fall 2008 no surface water flows were observed at SW-C3, SW-C8, SW-A1, or SW-B1 therefore no samples could be collected.
- DWB - dry weight basis
- J - Analyte detected between the limit of detection and limit of quantitation
- mg/L - milligrams/Liter
- NA - not applicable
- SO4 - Sulfate
- S.U. - Standard Unit
- tot. - total
- ug/L - micrograms/Liter
- umho@25C - micromho at 25 degrees Celcius
- < - Analyte not detected above the limit of detection

**Table 3**  
**Sediment and Soil Analytical Data**

Parameter	Units	S-IOBF-7	S-IOBF-8	S-IOBF-9	S-IOBF-10	S-IOBF-11	S-IOBF-12	S-MSBF-1	S-MSBF-2	S-MSBF-3	S-MSBF-4	S-MSBF-5	S-MSBF-6	S-1	S-3	S-4
		Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date	Collection Date
Copper, tot.	ug/L	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Iron, tot.	mg/Kg DWB	26000	22000	54000	24000	21000	16000	17000	25000	26000	18000	22000	21000	16000	24000	22000
Manganese, tot.	mg/Kg DWB	370	380	1100	440	440	300	470	490	480	330	500	380	1000	1600	1200
pH, lab (soil/sudge)	s.u. pHw	51.5	51.4	16.3	41.5	29.9	42.1	14.5	15.3	15.7	20.4	21.3	22.0	<2.0	6.2	6.7
Solids, tot. volatile	% DWB	120	87	250	96	96	61	57	64	69	51	59	57	75.2	36.6	30.8
Solids, total on solids	%													32	80	81
Zinc, tot.	ug/L															
Sulfate, as S	%															

Table 3  
Sediment and Soil Analytical Data

Sample ID	Collection Date	Soil, S-SS-1		Soil, S-SS-2		Soil, S-SS-3		Soil, S-SS-4		Soil, S-SS-5		Soil, S-SS-6		Soil, S-SS-7		Soil, S-SS-8		Soil, S-SS-9		Soil, S-SS-10			
		HH-1	7/31/2008	HH-1	7/31/2008	HH-2	7/31/2008	HH-3	7/31/2008	HH-4	7/31/2008	HH-5	7/31/2008	HH-6	7/31/2008	HH-7	7/31/2008	HH-8	7/31/2008	HH-9	7/31/2008	HH-10	7/31/2008
Area	Sample Depth (feet)	H&H Building		H&H Building		H&H Building		H&H Building		H&H Building		H&H Building		H&H Building		H&H Building		H&H Building		H&H Building		H&H Building	
Parameter	Units	0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33		0 - 0.33	
Copper, tot.	ug/L	76	71	70	290	54	7.8	8.9	11	13	12	180	20000	490	150	80.2	330	27					
Iron, tot.	mg/Kg DWB																						
Manganese, tot.	mg/Kg DWB																						
pH, lab (soil/sludge)	s.u. pHw	5.7	5.3	5.7	5.1	6.3	6.1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Solids, tot. volatile	% DWB																						
Solids, total on solids	%	96.4	97.4	97.7	92.9	95.6	89.2	93.6	89.8	84.5	91.7	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2
Zinc, tot.	ug/L																						
Sulfide, as S	%	< 0.01	0.01B	< 0.01	0.01B	< 0.01	0.01B	< 0.01	0.01B	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	

Notes:  
 DWB - dry weight basis  
 J - Analyte detected between the limit of detection and limit of quantitation  
 mg/Kg - milligrams/kilogram  
 pHw - pH of water slurry from solid  
 S.U. - standard unit  
 tot. - total  
 ug/L - micrograms/Liter  
 % - percent  
 < - Analyte not detected above the limit of detection  
 B - Analyte detected at a value between the method detection limit and practical quantitation limit

**Table 4**  
**Fish Species Observed**  
**Flambeau River, Ladysmith, Wisconsin**  
**September 2008**

Species	Relative Abundance	
	Thornapple Flowage	Ladysmith Flowage
Northern pike	C	C
Muskellunge	P	P
Golden shiner	--	P
Mimic shiner	C	C
Silver redhorse	A	P
Sand shiner	P	--
Golden redhorse	P	--
White sucker	C	C
Trout-perch	P	--
Black bullhead	A	P
Shorthead redhorse	--	P
Burbot	C	P
Bluegill	C	C
Rock bass	C	C
Pumpkinseed sunfish	P	P
Smallmouth bass	A	A
Black crappie	C	P
Brook stickleback	--	P
Yellow perch	A	A
Walleye	A	A
Logperch	C	C

A = abundant  
C = common  
P = present  
-- = not observed in that particular flowage

Prepared by: GJP  
Checked by: SVF

**Table 5**  
**Physical Data of Walleye**  
**Flambeau River, Ladysmith, Wisconsin**  
**September 2008**

ID No.	Length (mm)	Weight (g)	Sex <sup>1</sup>	Age
<b>Thornapple Flowage (September 9, 2008)</b>				
WE-TA-01	275	160	U*	2
WE-TA-02	371	445	M	3
WE-TA-03	372	470	M	3
WE-TA-04	415	555	M	4
WE-TA-05	400	590	F	4
WE-TA-06	451	840	F	5
WE-TA-07	490	1220	F	5
WE-TA-08	520	1335	F	6
WE-TA-09	572	1960	F	8
<b>Ladysmith Flowage (September 8, 2008)</b>				
WE-LS-01	272	150	U*	2
WE-LS-02	335	300	M	2
WE-LS-03	355	365	F	3
WE-LS-04	389	500	M	3
WE-LS-05	442	670	F	4
WE-LS-06	457	790	F	5
WE-LS-07	475	955	F	5
WE-LS-08	505	1170	F	6/7
WE-LS-09	536	1300	F	6

<sup>1</sup>U=unsexed, M=male, F=female  
mm – millimeters  
g - grams

Prepared by: GJP  
Checked by: SVF

**Table 6**  
**Stomach Analysis of Walleye**  
**Flambeau River, Ladysmith, Wisconsin**  
**September 2008**

<u>Thornapple Flowage (September 9, 2008)</u>			
Sample ID	Percent Full	Type of Content	General Comment
WE-TA-01	5	2 partial macroinvertebrates	Indiscernible matter
WE-TA-02	20	1 minnow, 25 mm	Mostly digested
WE-TA-03	0	None	None
WE-TA-04	0	None	None
WE-TA-05	0	None	None
WE-TA-06	10	1 minnow, 25 mm, vegetative matter	Mostly digested
WE-TA-07	50	1 minnow, 70 mm	Mostly digested
WE-TA-08	10	Minnow parts, vegetative matter	Mostly digested
WE-TA-09	30	Fish parts 70 mm (bullhead), vegetative matter	Mostly digested
<u>Ladysmith Flowage (September 8, 2008)</u>			
WE-LS-01	10	1 stonefly 10 mm	Mostly digested
WE-LS-02	5	1 minnow, 1 stonefly 8 mm	Mostly digested
WE-LS-03	0	None	None
WE-LS-04	80	1 minnow, 70	Mostly digested
WE-LS-05	40	1 minnow, 22	Mostly digested
WE-LS-06	0	None	None
WE-LS-07	0	None	None
WE-LS-08	20	Vegetative matter	Indiscernible matter
WE-LS-09	5	Vegetative matter	Indiscernible matter

mm - millimeters

Prepared by: GJP  
 Checked by: SVF

**Table 7**  
**Metals Analysis of Walleye Liver**  
**Flambeau River, Ladysmith, Wisconsin**  
**2008**

Sample ID	Sample Date	Copper mg/kg	Iron mg/kg	Manganese mg/kg	Zinc mg/kg
<b><u>Thornapple Flowage</u></b>					
WE-TA-(1-9) – (F-2)	9/9/2008	13	110	1.2	21
<b><u>Ladysmith Flowage</u></b>					
WE-LS-(1-9) – (F-1)	9/8/2008	21	120	2.0	29

Data for Thornapple fish liver sample has a lab ID# 493717  
 Data for Ladysmith fish liver sample has a lab ID# 493716  
 mg/kg – milligrams per kilogram

Prepared by: GJP  
 Checked by: SVF



**Table 8**  
**Crayfish Sampling Inventory**  
**September 8, 2008**

<b>Site Location</b>	<b>Time of Collection</b>	<b>Number of Crayfish</b>
Blackberry Lane	11:35	27
Port Arthur Dam	13:40	28
Meadowbrook Creek	13:41	30

Prepared by: GJP  
Checked by: SVF

**Table 9**  
**Metals Analysis of Crayfish**  
**Flambeau River, Ladysmith, Wisconsin**  
**September 8, 2008**

<b>Sample ID</b>	<b>Copper</b>	<b>Iron</b>	<b>Manganese</b>	<b>Zinc</b>
<b>Blackberry Lane</b>	mg/kg	mg/kg	mg/kg	mg/kg
FMC CR-BBL(M-1)	18	54	160	18
<b>Meadowbrook Creek</b>				
FMC CR-MBC(M-2)	26	88	130	18
<b>Port Arthur Dam</b>				
FMC CR-PAD(M-3)	29	59	140	18

Data for Blackberry Lane is represented by Sample ID# 493713, Meadowbrook Creek by Sample ID#493714, and Port Arthur Dam by ID#493715  
mg/kg – milligrams per kilogram

Prepared by: GJP  
Checked by: SVF