



October 20, 2003

Mr. Lawrence J. Lynch  
Wisconsin Department of Natural Resources  
Bureau of Solid and Hazardous Wastes  
101 South Webster Street, GEF II, P.O. Box 7921  
Madison, WI 53707-7921

Dear Mr. Lynch:

RE: Final Soil Sampling Results and Remediation Plan for the Flambeau Mining  
Company Railroad Spur West of STH 27, Ladysmith, Wisconsin

The purpose of this letter is to present the results of the field and laboratory investigations completed on the railroad spur west of STH 27 on the Flambeau Mining Company (Flambeau) property hereafter referred as the railroad spur west. In addition, a remediation plan is presented which proposes the methods and extent of excavation to remove the source of elevated copper concentrations in surface runoff from soil material within the railroad spur west area.

### **Background Information**

In August 1998 six soil samples were collected along the railroad spur west, the industrial outlet and the drainage areas adjacent to where ore handing had taken place. Sample S-4 had a copper (Cu) concentration of 230 mg/l. Subsequently, a soil sampling plan was submitted to the Wisconsin Department of Natural Resources (WDNR) dated July 9, 2003 that proposed additional soil sampling and analyses to characterize and delineate soils to be removed as part of the railroad spur west area reclamation. This plan proposed using shallow test pits to sample the sand and gravel soil over the railroad ballast and complete laboratory tests on the soils in the upper foot. In a letter dated July 18, 2003 the WDNR made the following comments on the sampling plan: that 1) soils be sampled deeper than the upper one foot for possible future analysis; 2) the fine fraction be collected along with the coarse during soil sampling; 3) test pits be excavated to a depth which exposes the underlying coarse ballast stone; 4) soil samples be analyzed for Cu, Sulfur (S) and pH; 5) WDNR expressed a preference that contaminated soils be disposed of at a licensed off-site landfill; and 6) that Flambeau develop criteria to delineate the extent of removal of contaminated soils from the railroad spur area. The WDNR's comments were incorporated into the field sampling plan. The railroad spur soil investigation was started and completed on July 24, 2003. Ron Poppie, engineering technician from Foth and Van Dyke and

Associates, Inc. (F&VD) completed the soil investigation and sampling which was observed by Mr. Ken Markart and Mr. Larry Lynch of the WDNR and Ms. Jana Murphy of Flambeau. The sampling methods and results of the investigation are described below.

### **Field Investigation Methods and Findings**

On July 24, 2003 Ron Poppie logged test pits and collected soil samples along the north and south side of the railroad spur. Figure 1 shows the location of the soil samples. Attachment 1 contains a copy of Mr. Poppie's field notes which describe the sample depth and sample collection methods. A skid-steer loader equipped with a backhoe attachment was used to excavate the sand and gravel and ballast along the railroad spur. A listing of the depths of soil samples collected is as follows:

At locations S-7 through S-10 and S-12 through S-15 samples of the sand and gravel were collected at 6 inches, 12 inches and 18 inches below the top of the railroad ties. The sample at 18 inches was collected at the interface between the coarse ballast rock and the lower sand and gravel fill.

At sample location S-11 (which is adjacent to sample point S-4 that had a Cu concentration of 230 mg/kg at a six-inch depth) sand and gravel were sampled at depths of 6, 12, 18 and 24 inches measured from the top of the existing grade.

At sampling locations S-16 through S-18 sand and gravel do not overlie the ballast. These soils were sampled at 12, 18 (ballast sand and gravel interface) and 24 inches.

Attachment 1 contains Mr. Poppie's field notes which include sketches of the sample locations described above along with the elevations shot at the sample locations. The soil samples were obtained from the test pit walls by scraping the fine soil materials (i.e. P200 fraction and the sand fraction) into a plastic Ziplock™ bag with a stainless steel spoon. The sampling tools were decontaminated after each sample by washing the sampling tool in an Alconox/water solution followed by a deionized water rinse. Attachment 1 also contains photographs of several of the areas excavated along the railroad spur to obtain soil samples. After soil sampling was completed, Mr. Poppie transported samples to the Foth & Van Dyke laboratory in Green Bay, WI. On July 25, 2003 the samples selected for laboratory analysis were relinquished to En Chem, Inc. The remaining samples were stored in the cooler at Foth & Van Dyke's Green Bay office.

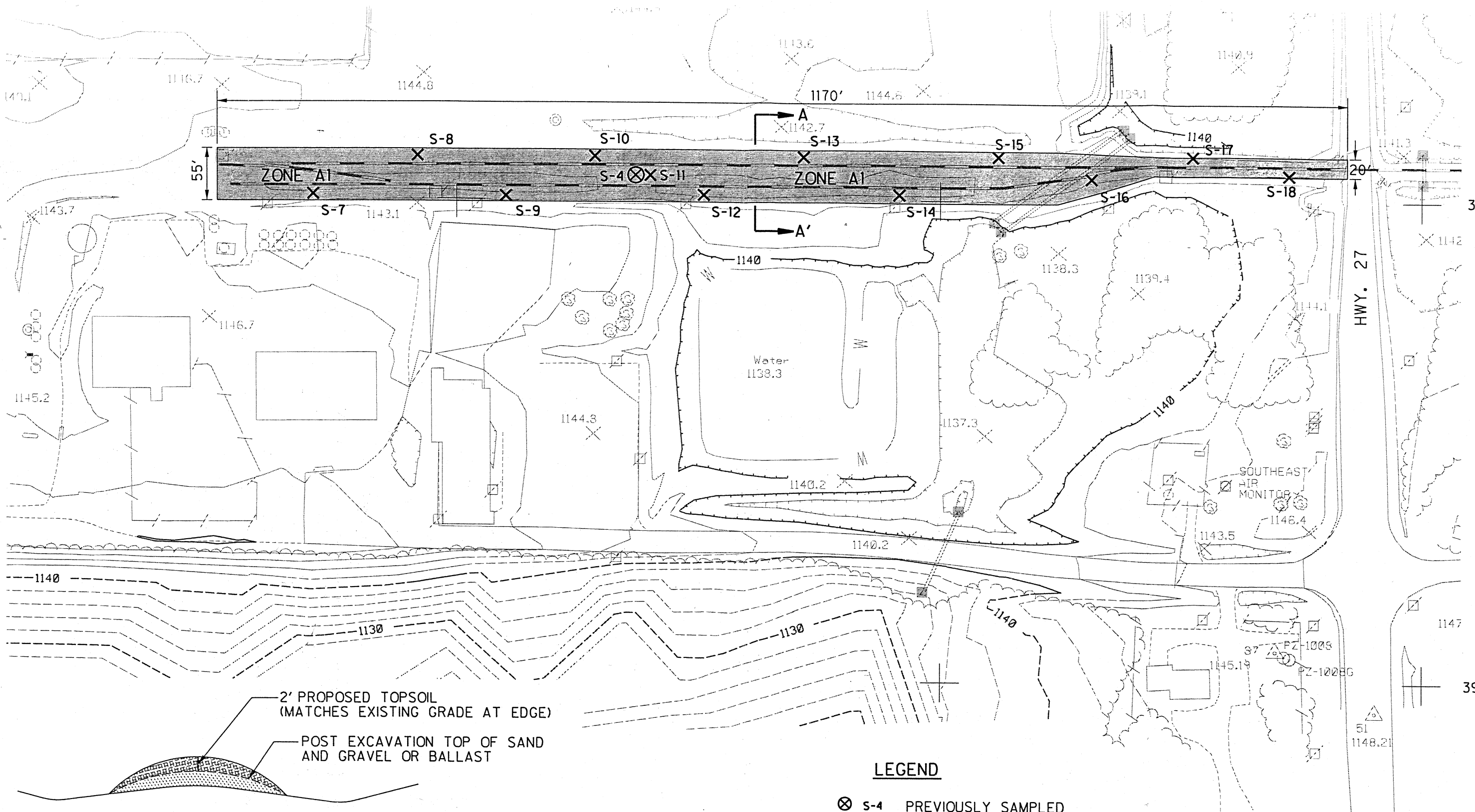
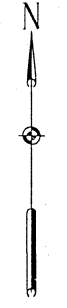
### **EnChem Inc. Laboratory Test Results**

EnChem, Inc. analyzed the samples submitted on July 25, 2003 for total Cu, S, pH and percent solids. The laboratory data sheets and chain of custody forms are included in Attachment 2. Table 1 lists the results for the soil samples analyzed for Cu, S and pH along

40,500E

41,000E

41,500E



2' PROPOSED TOPSOIL  
(MATCHES EXISTING GRADE AT EDGE)  
POST EXCAVATION TOP OF SAND  
AND GRAVEL OR BALLAST

**LEGEND**

- ⊗ S-4 PREVIOUSLY SAMPLED
- X S-13 PROPOSED SAMPLE LOCATIONS
- █ ZONE A1

**RAILROAD RECLAMATION SECTION A-A'**  
NOT TO SCALE

DEPTH OF EXCAVATION = 2 FEET

**NOTES:**

1. TOPSOIL GRADED TO MINIMUM 2% SLOPE.
2. SEED, FERTILIZE AND MULCH.

FLAMBEAU MINING CO.		
<b>FIGURE 1</b>		
<b>RAILROAD SPUR WEST OF HWY 27 SOIL REMEDIATION</b>		
Scale:	Date: OCTOBER, 2003	
Prepared By: Foth & Van Dyke	By: JRB2	03F002

10/20/03

with the sample identification (ID) and soil sample depth in feet. Soil samples from locations S-8, S-11 and S-14 were composited at depths of six inches (0.5') and 12 inches (1') to 18 inches (1.5') and tested for TCLP semivolatiles (SVOC's), inorganics including RCRA metals, free liquids, chlorine, percent solids, pH, specific gravity, sulfide and Volatiles (VOC's). The laboratory reports for these analyses are included in Attachment 2 and the results are summarized in Table 2.

Table 1 summarizes the extract sampling results. Typically the sample at the 0.5-foot depth had the highest Cu and S concentrations. At the 0.5-foot depth Cu ranged from 200 mg/kg in S-12 to 1600 mg/kg in S-11 and for S ranged from 352 mg/kg in S-15 to 15,490 mg/kg in S-9. Samples obtained along the west railroad spur where sand and gravel did not overlie the ballast (i.e. S-16 through S-18) were taken at depths of 1.5 feet and 2.0 feet at the sand and gravel/ ballast interface and below. Table 1 again shows that for these samples the highest concentrations for both Cu and S were in the upper or 1.5 foot depth. In general it can be concluded that the greatest concentrations of Cu and S occur at the 0.5 foot to 1 foot depth and, in the case of locations S-16 through S-18, the greatest concentrations of Cu and S occur at the 1.5 foot to 2.0 foot depth. Photographs (Attachment 1) of the excavations from which the soil samples were taken also provide an indication of the presence of high S content in the soil horizons discussed above. The photographs of the excavations of the sand and gravel and ballast at sample locations S-9, S-10 and S-16 have evidence of yellowish staining in the upper most sand and gravel layers and yellowish staining is evident directly below the ballast at sample location S-16.

In review of the data in Table 1 it is important to note that the fine soil sizes (i.e. P200 and sand size particles) were selected for laboratory analyses as requested by the WDNR. So the Cu, S and pH total analyses were run on the sand and other fine particles in the soil since it is believed that these fine particles would contain the greatest concentrations of Cu and S in the soil. Since the fines in the soil were selectively sampled the concentrations of Cu and S presented in Table 1 are likely two or more times greater than the actual concentrations in the total sand and gravel mass since the gravel and coarse fraction was purposely excluded from the sampling so that the contaminated horizons could be more easily identified.

It was recognized that soil removal at the railroad spur should be based on the total copper/sulfur/pH results coupled with the potential for the soils to leach copper rather than the extract values presented in Table 1. Table 2 and the laboratory analytical reports (Attachment 2) contain the results of the TCLP (an acid leaching procedure) completed on composite samples. The results are low Cu concentrations (i.e. 8.0 mg/l in the shallow soil sample and 2.1 mg/l in the deep composite soil sample).

In an attempt to mimic actual field conditions Flambeau completed EPA 1312 SPLP testing (SPLP testing). The SPLP testing estimated the *leachability* of copper during a

precipitation event for the range of concentrations exposed along the railroad spur. The WDNR was informed of the SPLP laboratory testing in a letter dated August 29, 2003 which is included in Attachment 3. The letter in Attachment 3 includes a copy of an internal Foth & Van Dyke memorandum that lists the samples selected for SPLP testing. These samples were selected since they represent the range of Cu and S values that have been identified along the railroad spur. The results of the SPLP testing is provided and discussed below.

### **EnChem EPA 1312 SPLP Testing Results**

EnChem Inc. completed the SPLP tests and the test data are included in Attachment 4. Table 3 summarizes the results of the EPA 1312 SPLP testing and includes the total values for Cu and S determined during the testing completed earlier that is summarized in Table 1. The soil samples selected for SPLP testing represent a range of the values for total Cu and S that were measured during earlier testing. Table 3 shows that the total Cu and S values are typically two to three orders of magnitude higher than the SPLP values.

### **Summary of Laboratory Test Results**

Table 1, which summarizes the extract or total laboratory values for Cu and S, must be viewed realizing the results represent testing of only the sand and fines (P200) portions of the sand and gravel in place. So on a total sample basis the actual total Cu and S concentration are likely to be a least half of the values listed in Table 2.

Table 2 summarizes the TCLP testing completed on shallow (0.5 ft) and deep (1.0-1.5 ft) composite samples. The TCLP tests resulted in no detects of RCRA metals, SVOC's or VOC's. Only lower concentrations of copper (i.e., 2.1 to 8.0 mg/l) were detected. TCLP results are used by most Municipal Solid Waste Landfill as the criteria for accepting special wastes. Waste Management of Wisconsin was contacted regarding their acceptance standards which for copper are < 100 mg/l and for reactive sulfur 200 ppm. Therefore, the soils tested meet these standards.

Table 3 summarizes the EPA 1312 results for the range of Cu and S concentrations identified in the fine soil fraction around the railroad spur. These results indicate that leaching by water from precipitation is unlikely to produce water with high Cu or S concentrations.

## **Plan for Remediation of Railroad Spur**

### **Excavation of Two Feet of Potentially Contaminated Materials and Disposal at an Off-Site Landfill**

Figure 1 shows the proposed extent of excavation along the railroad spur. Flambeau is proposing to excavate two feet over the entire area shown shaded. The entire shaded area has been designated as Zone A-1. The total volume of in-place material to be excavated has been estimated at approximately 4,120 cubic yards or 7,510 tons (at an estimated 135 pounds per cubic foot in-place).

Waste Management of Wisconsin's Timberline Trails Landfill site in Bruce, Wisconsin (Timberline) was contacted regarding landfilling the excavated material and has agreed to dispose of this material.

### **Excavation and Reclamation Methods and Materials**

Flambeau intends to complete the railroad spur west area reclamation before the first snowfall of 2003. It is expected that the work will be underway in late October or early November 2003 and be completed in approximately 10 working days.

The railroad tracks and ties will be removed and salvaged prior to the start of excavation. Zone A-1, as shown on Figure 1, will be excavated using a rubber tire loader. The sand and gravel or ballast will be loaded directly on trucks, the trucks tarped and each load hauled for disposal at the Timberline Trails Landfill. The excavated area will be regraded either this fall or next spring, (2004), as shown on the reclamation Section A-A' on Figure 1. The regraded area will then be covered with topsoil. The topsoil will have a minimum thickness of six inches and have a minimum slope of two percent. The topsoiled area will be seeded, fertilized and mulched. A seed mix the same as that used for the industrial out lot will be applied at an appropriate rate. Any areas of bare ground will be reseeded.

### **Concluding Remarks**

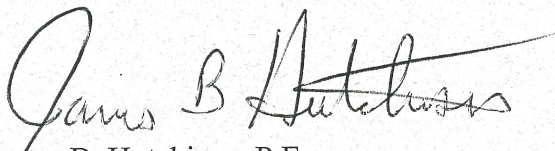
Flambeau has characterized the shallow soils below the railroad spur and discovered low leachable concentrations of Cu and S. Remedial measures have been proposed to minimize Cu and S from impacting surface water quality. The remedial measures include removing two feet of material, some of which does not have significant concentrations of Cu and S and disposing the excavated material at a licensed landfill. Despite significant evidence that indicates leaving some of these materials in-place would not impact surface waters, Flambeau proposes to remove the entire two feet of material. In light of Flambeau's cooperation and the fact that the great majority of the contaminated material

Mr. Lawrence J. Lynch  
Wisconsin Department of Natural Resources  
October 20, 2003  
Page 6

will be removed, it is requested that WDNR take this into account regarding post-reclamation environmental monitoring for the railroad spur west area. Flambeau desires to complete this work during the 2003 construction season so time is of the essence for WDNR's approval of the proposed remedial measures. Your prompt attention to this matter would be most appreciated.

Sincerely,

Foth & Van Dyke and Associates, Inc.



James B. Hutchison, P.E.  
*Project Manager*

Attachments

cc: Al Christianson, City of Ladysmith  
Fred Fox, Kennecott Minerals Company  
Ken Markart, WDNR  
Randy Tatur, Rusk Co.  
Tom Portle, WDNR  
Tom Riegel, Town of Grant  
Bill Stoll, Applied Ecological Services  
Rusk Co. Zoning

# Tables



**Table 1**  
**Extract Sampling - Total Cu and S Results\***

**INORGANICS**

<b>Field ID</b>	<b>Depth</b>	<b>Copper (mg/Kg)</b>	<b>pH (su)</b>	<b>Sulfur (mg/kg)</b>
S-7	0.5	220	4.5	1306
	1.0	130	4.6	46
	1.5	150	5.6	17
S-8	0.5	410	2.5	15040
	1.0	370	3.8	733
	1.5	270	3.9	105
S-9	0.5	600	2.5	15490
	1.0	260	3.5	740
	1.5	250	3.6	96
S-10	0.5	240	2.7	2904
	1.0	290	3.6	274
	1.5	220	3.9	147
S-11	0.5	1600	4.6	10650
	1.0	40	6	26
	1.5	110	5.7	155
	2.0	56	5.9	123
S-12	0.5	200	2.6	1628
	1.0	77	5.3	85
	1.5	170	3.4	343
S-13	0.5	240	3.2	1338
	1.0	92	4.5	150
	1.5	200	4.2	293
S-14	0.5	290	4	793
	1.0	93	4.8	207
	1.5	120	3.8	95
S-15	0.5	220	3.3	352
	1.0	88	5.9	58
	1.5	130	4.9	38
S-16	1.5	800	3.1	3991
	2.0	170	3.4	180
S-17	1.5	3400	3.8	19400
	2.0	210	4.6	253
S-18	1.5	860	4.8	12990
	2.0	540	5.6	363

Prepared by: TLB1  
Checked by: NAJ

**Notes:**

\*refer to Attachment 2 for EnChem, Inc. Laboratory analytical reports

**Table 2  
Characteristic Sampling**

Inorganics Test	Shallow Composite <sup>1</sup>	Deep Composite <sup>2</sup>	LOD	LOQ	Units	Analysis	Prep	Analysis	Laboratory
	Results	Results				Date	Method	Method	
Arsenic	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Barium	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Cadmium	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Chromium	ND	ND			mg/L	08/01/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Copper	8.0	2.1			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Lead	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Mercury	ND	ND			mg/L	08/07/2003	SW846 7470A	SW846 7470A	En Chem Inc.
Nickel	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Selenium	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Silver	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Zinc	ND	ND			mg/L	07/31/2003	SW846 3010A	SW846 6010B	En Chem Inc.
Cyanide	ND	ND			mg/kg	08/05/2003	SW846 MET	SW846 MET	En Chem Inc.
Free Liquids	0.0	0.0			%	07/31/2003	SW846 9095A	SW846 9095A	En Chem Inc.
Percent Chlorine	0.032	0.027	0.005	0.017	% wt.	08/01/2003	ASTM D808	ASTM D808	En Chem Inc.
Percent Solids	98.5	96.9			%	07/25/2003	SM 2540G M	SM 2540G M	En Chem Inc.
pH	3.3	4.4			su	07/31/2003	SW846 9045C	SW846 9045C	En Chem Inc.
Specific Gravity	2.4	2.4			g/mL	08/01/2003	SM 2710F	SM 2710F	En Chem Inc.
Sulfide	ND	ND			mg/kg	08/05/2003	SW846 MET	SW846 MET	En Chem Inc.
Total Solids	980000	970000			mg/Kg	07/25/2003	SM-2540G	SM-2540G	En Chem Inc.
<b>TCLP Volatiles</b>									
<b>Analyte</b>									
1,1-Dichloroethene	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
1,2-Dichloroethane	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
2-Butanone	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
Benzene	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
Carbon Tetrachloride	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
Chlorobenzene	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
Chloroform	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
Tetrachloroethene	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
Trichloroethene	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
Vinyl Chloride	ND	ND			mg/L	07/31/2003	SW846 5030B	SW846 8260B	En Chem Inc.
<b>Semivolatiles - TCLP</b>									
<b>Analyte</b>									
1,4-Dichlorobenzene	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
2,4,5-Trichlorophenol	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
2,4,6-Trichlorophenol	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
2,4-Dinitrotoluene	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
Cresol	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
Hexachlorobenzene	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
Hexachlorobutadiene	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
Hexachloroethane	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
Nitrobenzene	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
Pentachlorophenol	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.
Pyridine	ND	ND			mg/L	08/08/2003	SW846 3510C	SW846 8270C	En Chem Inc.

Notes:

- <sup>1</sup> Shallow Composite - S-8, S-11 and S-14 - 0.5 feet
- <sup>2</sup> Deep Composite - S-8, S-11 and S-14 - 1.0 - 1.5 feet

Prepared by: TLB1  
Checked by: NAJ

**Table 3**  
**EPA 1312 SPLP Test Results**

Sample No.	Depth (ft.)	Total Cu (mg/kg)	SPLP Cu (mg/l)	Total S (mg/kg)	SPLP S (mg/l)
S-11	1	40	0.096	26	3.0*
S-9	1	260	0.94	740	7.0*
S-16	1.5	800	1.4	3991	7.9*
S-11	0.5	1600	1.0	10,650	4.9*

**Notes:**

\* The background sulfur in the SPLP blank was 2.9mg/l

**Attachment 1**  
**Field Notes, Sketches and Photographs**



## CONSTRUCTION OBSERVATION REPORT

WEATHER	Temp (° F)		Sky Cond.	Precip. (in.)			Site Conditions (describe)	
	Low	High	Clear <u>Pt. Cldy<sup>70</sup></u> Cloudy	None	Rain	Snow	<u>Dry</u>	Muddy
	60	83	None					

**Location** RAILROAD SPUR FROM FORMER MINE SITE

**Contractors on site** (include no. of personnel per contractor)

1 - SKID STEER EQUIPPED w/ SMALL BACKHOE BUCKET

**Other personnel on site**

**Purpose**

KEN MARKART & LARRY LYNCH, WDNR OBSERVE SAMPLING  
JANA MURPHY & JACK CHRISTMAN FMCO OBSERVE/SUPERVISE AND EXCAVATE.

**Work observation report, comments:** 0830 REP ON SITE REVIEW SITE SAFETY w/

JANA MURPHY. REP LAID OUT SAMPLE POINTS S-7 THRU S-18 ALONG THE  
N & S SIDES OF THE RAILROAD SPUR EXITING THE FORMER MINE SITE, EAST.

- EXCAVATIONS WERE PERFORMED BY JACK C. WITH THE USE OF A SMALL SKID STEER

- REP MEASURED DOWN FROM THE RAILS AS A REFERENCE POINT TO THE 6" 12"  
& 18" SAMPLE POINTS (S-11 TO 24" ADDITIONAL SAMPLE). MR. K. MARKART

REQUESTED THAT THE SAMPLES BE GRABBED FROM BETWEEN THE RR TIES.

SAMPLES S-7 THRU S-15 WERE SAMPLED AT 6", 12" & 18" DEPTHS FROM THE TOP  
OF RAIL, FIRST 6" LAYER, UNDERLYING RR BALLAST WAS 1.3' TO 1.5' THICK

(SEE PHOTO DOC) w/ THE EXCEPTION OF S-11 WHICH WAS MEASURED DOWN  
FROM EXIST. GRADE AT 6, 12, 18 & 24" DEPTHS. SAMPLE POINTS S-16, 17, 18

HAD NO OVERLAYING GRAVEL OVER THE BALLAST AND WERE SAMPLED JUST  
BENEATH THE RR BALLAST, SAND FILL, INTERFACE. IT WAS DIFFICULT TO ACQUIRE

FINE MATERIAL AT THE 12" SAMPLE DEPTHS DUE TO THE LACK OF FINE  
MATERIAL, SAMPLES AT THE 18" DEPTH WERE ACQUIRED AT THE BALLAST<sup>(S-7 THRU S-15)</sup>

SAND/GRAVEL INTERFACE. SAMPLING TOOLS WERE DECONTAMINATED AFTER EACH  
DEPTH CHANGE AND BETWEEN SAMPLE POINTS USING AN ALCONOX/WATER SOLUTION

w/ A D.I WATER RINSE. SAMPLES WERE PLACED IN ZIP LOCK BAGS AND  
TRANSPORTED TO FOTH & VAN DYKE GREEN BAY FOR PROCESSING ON 7/25/03

THEN SHIPPED TO ENCIOM LABS FOR ANALYSIS.

NOTE: THE ENTIRE 6" DEPTH OF GRAVEL OVER BALLAST AT S-7 THRU 15 WAS  
SAMPLED. AT S-16 THRU S-18, AN ADDITIONAL SAMPLE WAS GRABBED AT

THE 24" INTERVAL, (ELIMINATING THE 6" SAMPLE DEPTH)

For additional comments, include additional sheets. REP OFFSITE AT 1600 MOBILIZE TO GREEN BAY



Level - REP

ROD Person - J. Murphy

BM -	4 HWY 27 @ RR TRACKS	4.80'	ASSUME 100.0'
Top of RAIL (R) / Ground SURFACE (G)		R / G	
S-18	4.83 / 5.32	Ballast	<del>95.17</del> / <del>94.68</del> 99.97 / 99.48
S-17	5.00 / 5.54	Ballast	<del>95.00</del> / <del>94.46</del> 99.80 / 99.26
S-16	5.13 / 5.74	Ballast	<del>94.87</del> / <del>94.26</del> 99.67 / 99.06
S-15	5.10 / 5.20	Gravel	<del>94.90</del> / <del>94.80</del> 99.70 / 99.60
S-14	5.00 / 5.03		<del>95.00</del> / <del>94.97</del> 99.8 / 99.77
S-13	4.92 / 5.03		<del>95.08</del> / <del>94.97</del> 99.88 / 99.77
S-12	4.89 / 4.97		<del>95.11</del> / <del>95.03</del> 99.91 / 99.83
S-11	N/A / 5.10		<del>94.90</del> 99.70
S-10	4.97 / 5.05		<del>95.03</del> / <del>94.95</del> 99.83 / 99.75
S-9	5.10 / 5.19		<del>94.90</del> / <del>94.81</del> 99.70 / 99.61
S-8	5.16 / 5.21		<del>94.84</del> / <del>94.75</del> 99.64 / 99.59
S-7	4.89 / 4.92		<del>95.11</del> / <del>95.08</del> 99.91 / 99.88

RAIL SHOT FOR FUTURE REFER. PAINTED / STAKED EA. LOC.

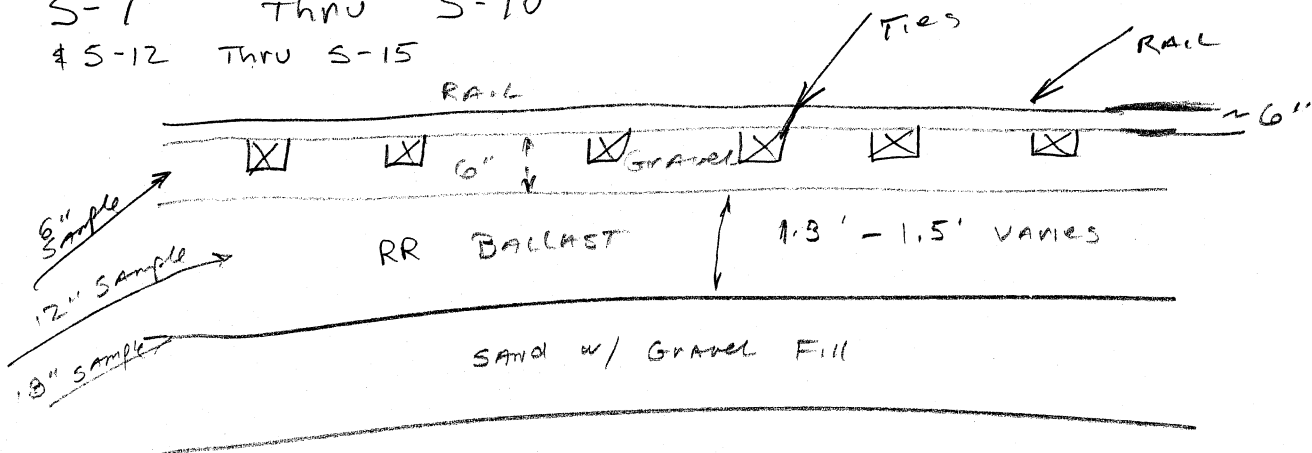
\* RAILS APPROX 0.5' IN HEIGHT



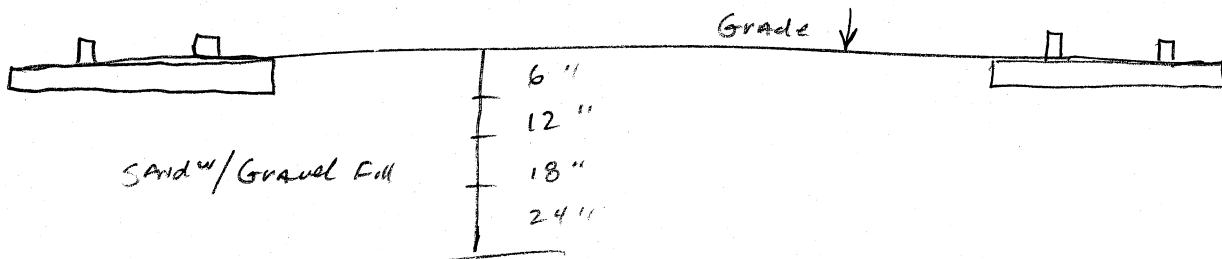
**Foth & Van Dyke**  
consultants · engineers · scientists

Client: FMCO Scope I.D.: 03F002  
 Project: RR SPUR SAMPLING Page: \_\_\_\_\_  
 Prepared By: REP Date: 7/24/03  
 Checked By: \_\_\_\_\_ Date: \_\_\_\_\_

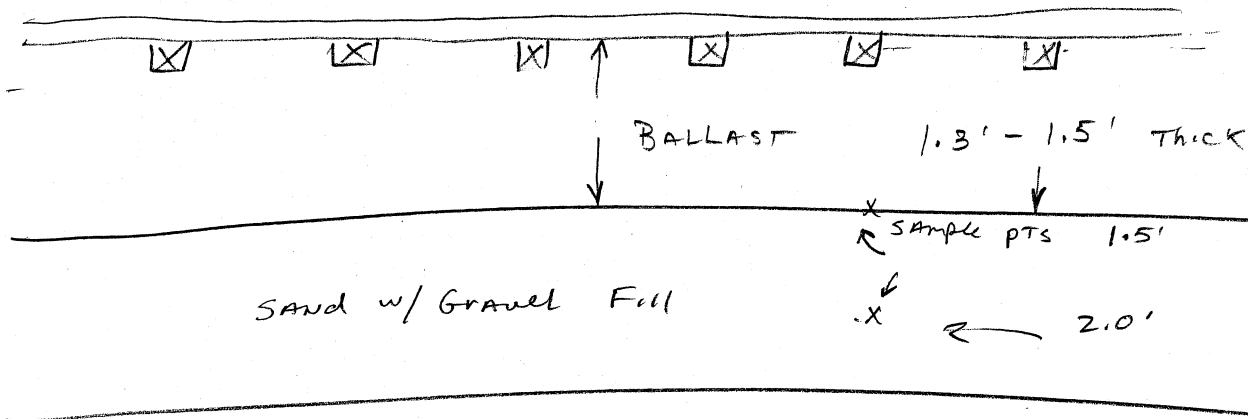
S-7 Thru S-10  
 S-12 Thru S-15



S-11



S-16 Thr S-18





Photograph 1

July 24, 2003

Description: Soil Sampling location S-9-Flambeau Railroad Spur



Photograph 2

July 24, 2003

Description: Soil Sampling location S-10- Flambeau Railroad Spur





Photograph 3 July 24, 2003  
Description: Soil Sampling location S-12- Flambeau Railroad Spur



Photograph 4 July 24, 2003  
Description: Soil Sampling location S-16 - Flambeau Railroad Spur

**Attachment 2**  
**EnChem, Inc. – Analytical Reports**  
**Total Cu, S and PH**

# En Chem Inc.

920-469-2436

1241 Bellevue Street

Green Bay, WI 54302

800-7-ENCHEM

Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-7-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-001

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	220	0.32	1.1		10	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	97.4				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.5				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	1306	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-7-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-002

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	130	0.16	0.54		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	96.2				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.6				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	46	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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800-7-ENCHEM

Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-7-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-003

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	150	0.16	0.54		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	96.1				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	5.6				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	17	6.0	20		1	mg/kg	Q	08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-8-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-004

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	410	0.16	0.53		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	98.4				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	2.5				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	15040	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

# En Chem Inc.

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-8-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-005

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	370	0.16	0.54		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	97.3				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.8				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	733	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

# En Chem Inc.

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Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-8-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-006

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	270	0.16	0.53		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	96.6				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.9				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	105	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038



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Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-9-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-007

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	600	0.16	0.52		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	98.5				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	2.5				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	15490	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

# En Chem Inc.

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Green Bay, WI 54302

800-7-ENCHEM

Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-9-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-008

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	260	0.16	0.54		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	96.4				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.5				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	740	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

# En Chem Inc.

920-469-2436

1241 Bellevue Street

Green Bay, WI 54302

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Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-9-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-009

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	250	0.16	0.54		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	96.3				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.6				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	96	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

# En Chem Inc.

920-469-2436

1241 Bellevue Street

Green Bay, WI 54302

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Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-10-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-010

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	240	0.16	0.53		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	97.2				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	2.7				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	2904	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-10-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-011

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	290	0.16	0.53		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	96.9				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.6				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	274	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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Green Bay, WI 54302

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-10-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-012

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	220	0.16	0.54		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	97.1				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.9				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	147	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

# En Chem Inc.

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Green Bay, WI 54302

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Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-8/11/14-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-013

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Leach Date	Compleat				1			07/29/03	SW846 1311	
Leach Date	Compleat				1			07/29/03	SW846 1311	
Arsenic - TCLP	< 1.0			1.0	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Barium - TCLP	< 1.0			1.0	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Cadmium - TCLP	< 0.25			0.25	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Chromium - TCLP	< 0.25			0.25	1	mg/L		08/01/03	SW846 3010A	SW846 6010B
Copper - TCLP	8.0			0.25	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Lead - TCLP	< 0.050			0.050	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Mercury - TCLP	< 0.0020			0.0020	1	mg/L		08/07/03	SW846 7470A	SW846 7470A
Nickel - TCLP	< 0.050			0.050	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Selenium - TCLP	< 1.0			1.0	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Silver - TCLP	< 0.25			0.25	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Zinc - TCLP	< 1.0			1.0	1	mg/L	A	07/31/03	SW846 3010A	SW846 6010B
Cyanide, Reactive	< 0.013			0.013	1	mg/kg		08/05/03	SW846 MET	SW846 MET
Free Liquids (Paint Filter)	0.0				1	%		07/31/03	SW846 9095A	SW846 9095A
Percent Chlorine	0.032	0.0050	0.017		1	% wt.		08/01/03	ASTM D808	ASTM D808
Percent Solids	98.5				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.3				1	su		07/31/03	SW846 9045C	SW846 9045C
Specific Gravity	2.4				1	g/mL		08/01/03	SM 2710F	SM 2710F
Sulfide, Reactive	< 26			26	1	mg/kg		08/05/03	SW846 MET	SW846 MET
Total Solids	980000			20	1	mg/Kg		07/25/03	SM-2540G	SM-2540G

### TCLP VOLATILES

Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Preservation Date:	Prep Date: 07/31/03	Analysis Method
								Analysis Date	Prep Method	
1,1-Dichloroethene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
1,2-Dichloroethane	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
2-Butanone	< 0.025			0.025	5	mg/L	&	07/31/03	SW846 5030B	SW846 8260B
Benzene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Carbon Tetrachloride	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Chlorobenzene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Chloroform	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Trichloroethene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B

### SEMIVOLATILES -TCLP

Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Preservation Date:	Prep Date: 07/31/03	Analysis Method
								Analysis Date	Prep Method	
1,4-Dichlorobenzene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
2,4,5-Trichlorophenol	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
2,4,6-Trichlorophenol	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C

# En Chem Inc.

920-469-2436

1241 Bellevue Street

Green Bay, WI 54302

800-7-ENCHEM

Fax: 920-469-8827

## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-8/11/14-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-013

### SEMIVOLATILES -TCLP

Preservation Date:

Prep Date: 07/31/03

Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
2,4-Dinitrotoluene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Cresol, Total	< 0.50			0.50	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Hexachlorobenzene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Hexachlorobutadiene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Hexachloroethane	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Nitrobenzene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Pentachlorophenol	< 0.62			0.62	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Pyridine	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C



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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Matrix Type : SOIL

Project Name : FLAMBEAU MINE, RR SOUR

Collection Date : 07/24/03

Project Number : 03F002

Report Date : 08/11/03

Field ID : S-8/11/14-1.0-1.5

Lab Sample Number : 837037-014

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Leach Date	Compleat				1			07/29/03	SW846 1311	
Leach Date	Compleat				1			07/29/03	SW846 1311	
Arsenic - TCLP	< 1.0			1.0	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Barium - TCLP	< 1.0			1.0	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Cadmium - TCLP	< 0.25			0.25	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Chromium - TCLP	< 0.25			0.25	1	mg/L		08/01/03	SW846 3010A	SW846 6010B
Copper - TCLP	2.1			0.25	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Lead - TCLP	< 0.050			0.050	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Mercury - TCLP	< 0.0020			0.0020	1	mg/L		08/07/03	SW846 7470A	SW846 7470A
Nickel - TCLP	< 0.050			0.050	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Selenium - TCLP	< 1.0			1.0	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Silver - TCLP	< 0.25			0.25	1	mg/L		07/31/03	SW846 3010A	SW846 6010B
Zinc - TCLP	< 1.0			1.0	1	mg/L	A	07/31/03	SW846 3010A	SW846 6010B
Cyanide, Reactive	< 0.013			0.013	1	mg/kg		08/05/03	SW846 MET	SW846 MET
Free Liquids (Paint Filter)	0.0				1	%		07/31/03	SW846 9095A	SW846 9095A
Percent Chlorine	0.027	0.0050	0.017		1	% wt.		08/01/03	ASTM D808	ASTM D808
Percent Solids	96.9				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.4				1	su		07/31/03	SW846 9045C	SW846 9045C
Specific Gravity	2.4				1	g/mL		08/01/03	SM 2710F	SM 2710F
Sulfide, Reactive	< 26			26	1	mg/kg		08/05/03	SW846 MET	SW846 MET
Total Solids	970000			20	1	mg/Kg		07/25/03	SM-2540G	SM-2540G

### TCLP VOLATILES

Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Preservation Date:	Prep Date: 07/31/03	Analysis Method
								Analysis Date	Prep Method	
1,1-Dichloroethene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
1,2-Dichloroethane	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
2-Butanone	< 0.025			0.025	5	mg/L	&	07/31/03	SW846 5030B	SW846 8260B
Benzene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Carbon Tetrachloride	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Chlorobenzene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Chloroform	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Trichloroethene	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 0.0050			0.0050	5	mg/L		07/31/03	SW846 5030B	SW846 8260B

### SEMIVOLATILES -TCLP

Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Preservation Date:	Prep Date: 07/31/03	Analysis Method
								Analysis Date	Prep Method	
1,4-Dichlorobenzene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
2,4,5-Trichlorophenol	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
2,4,6-Trichlorophenol	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-8/11/14-1.0-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-014

### SEMIVOLATILES -TCLP

Preservation Date:

Prep Date: 07/31/03

Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
2,4-Dinitrotoluene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Cresol, Total	< 0.50			0.50	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Hexachlorobenzene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Hexachlorobutadiene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Hexachloroethane	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Nitrobenzene	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Pentachlorophenol	< 0.62			0.62	5	mg/L		08/08/03	SW846 3510C	SW846 8270C
Pyridine	< 0.25			0.25	5	mg/L		08/08/03	SW846 3510C	SW846 8270C

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-11-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-015

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	1600	0.16	0.53		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	97.7				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.6				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	10650	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-11-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-016

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	40	0.16	0.53		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	97.9				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	6.0				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	26	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-11-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-017

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	110	0.16	0.54		5	mg/Kg		07/29/03	SW846 3050B	SW846 6020
Percent Solids	96.6				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	5.7				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	155	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-11-2.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-018

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	56	0.16	0.55		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	95.6				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	5.9				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	123	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-12-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-019

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	200	0.16	0.53		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	97.8				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	2.6				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	1628	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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**Analytical Report Number: 837037**

**Client :** FOTH & VAN DYKE

**Matrix Type :** SOIL

**Project Name :** FLAMBEAU MINE, RR SOUR

**Collection Date :** 07/24/03

**Project Number :** 03F002

**Report Date :** 08/21/03

**Field ID :** S-12-1.0

**Lab Sample Number** 837037-020

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**INORGANICS**

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	77	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	96.5				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	5.3				1	su		07/31/03	SW846 9045C	SW846 9045C
Sulfur	85	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038



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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-12-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-021

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	170	0.16	0.53		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	96.9				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.4				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	343	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-13-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-022

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	240	0.15	0.52		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	100				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.2				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	1338	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-13-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-023

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	92	0.16	0.53		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	98.4				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.5				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	150	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-13-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-024

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	200	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	96.6				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.2				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	293	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-14-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-025

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	290	0.16	0.53		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	97.9				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.0				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	793	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-14-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-026

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	93	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	97.1				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.8				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	207	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-14-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-027

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	120	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	96.8				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.8				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	95	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-15-0.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-028

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	220	0.16	0.53		5	mg/Kg.		07/31/03	SW846 3050B	SW846 6020
Percent Solids	98.5				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.3				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	352	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038



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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-15-1.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-029

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	88	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	97.2				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	5.9				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	58	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-15-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-030

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	130	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	96.4				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.9				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	38	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-16-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-031

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	800	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	95.8				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.1				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	3991	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-16-2.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-032

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	170	0.16	0.53		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	97.6				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.4				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	180	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-17-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-033

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	3400	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	96.6				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	3.8				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	19400	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-17-2.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-034

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	210	0.16	0.53		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	97.1				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.6				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	253	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-18-1.5

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-035

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	860	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	96.2				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	4.8				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	12990	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038

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## Analytical Report Number: 837037

Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINE, RR SOUR

Project Number : 03F002

Field ID : S-18-2.0

Matrix Type : SOIL

Collection Date : 07/24/03

Report Date : 08/11/03

Lab Sample Number : 837037-036

### INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Copper	540	0.16	0.54		5	mg/Kg		07/31/03	SW846 3050B	SW846 6020
Percent Solids	95.7				1	%		07/25/03	SM 2540G M	SM 2540G M
pH, Laboratory	5.6				1	su		08/01/03	SW846 9045C	SW846 9045C
Sulfur	363	6.0	20		1	mg/kg		08/04/03	SW846 9038	SW846 9038



(Please Print Legibly)

Company Name: Foth & Van Dyke  
 Branch or Location: Green Bay, WI  
 Project Contact: JANIS KESY  
 Telephone: 970-497-2500  
 Project Number: 03F002  
 Project Name: Flambeau RR. Spur  
 Project State: WISCONSIN  
 Sampled By (Print): R. Poppin

Data Package Options - (please circle if requested)  
 Sample Results Only (no QC)  
 EPA Level II (Subject to Surcharge)  
 EPA Level III (Subject to Surcharge)  
 EPA Level IV (Subject to Surcharge)

LABORATORY ID (Lab Use Only)	FIELD ID	COLLECTION		MATRIX
		DATE	TIME	
	S-8/11/14-0.5	7/24/14	1110	S
	S-8/11/14-1.0-1.5		1140	S
	S-8/11/14-0.5			
	S-8/11/14-1.0-1.5			
	S-8/11/14-0.5			
	S-8/11/14-1.0-1.5			
	S-8/11/14-0.5			
	S-8/11/14-1.0-1.5			

Regulatory Program  
 UST  
 RCRA  
 SDWA  
 NPDES  
 CERCLA

Matrix Codes  
 W=Water  
 S=Soil  
 A=Air  
 C=Charcoal  
 B=Biota  
 SI=Sludge

Rush Turnaround Time Requested (TAT) - Prelim  
 (Rush TAT subject to approval/surcharge)  
 Date Needed:  
 Transmit Prelim Rush Results by (circle):  
 Phone Fax E-Mail  
 Phone #: \_\_\_\_\_  
 Fax #: \_\_\_\_\_  
 E-Mail Address: \_\_\_\_\_  
 Samples on HOLD are subject to special pricing and release of liability

Relinquished By: R. Poppin  
 Relinquished By: \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_

# CHAIN OF CUSTODY

\*Preservation Codes  
 D=H2SO4 C=H2SO4 E=EnCore  
 F=Methanol G=NaOH  
 H=Sodium Bisulfate Solution J=Sodium Thiosulfate  
 K=Other  
 FILTERED? (YES/NO)  
 PRESERVATION (CODE)\*

ANALYSES REQUESTED  
 TCE, PCE, CHLORIDE, METALS, PAH, PCBs, BTEX, TOXICITY, VAPOR, TSP, VORP, TSS, CHLORIDE - SUB TO SF  
 TOTAL # OF BOTTLES SENT

CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)
1	TACS
1	1602
1	1602
1	Amber
1	Amber
2	
2	
1	
1	

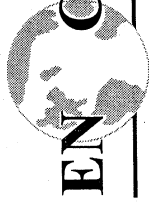
Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

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 Green Bay, WI 54302  
 920-469-2436  
 FAX 920-469-8927









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FAX 920-469-8827

# CHAIN OF CUSTODY

Preservation Codes  
 D=HM03 E=EnCore G=NaOH  
 F=Methanol J=Other  
 None B=HCL C=H2SO4  
 H= Sodium Bisulfate Solution  
 FILTERED? (YES/NO)  
 PRESERVATION (CODE)\*

(Please Print Legibly)  
 Company Name: FOTH A VAN DYKE  
 Branch or Location: GREEN BAY, WI  
 Project Contact: JANIS KESY  
 Telephone: 920-497-2500  
 Project Number: 03F02Z  
 Project Name: FLAMBEAU MINE BR SLUR  
 Project State: WISCONSIN  
 Sampled By (Print): R. Poppie

Data Package Options - (please circle if requested)  
 Sample Results Only (no QC)  
 EPA Level II (Subject to Surcharge)  
 EPA Level III (Subject to Surcharge)  
 EPA Level IV (Subject to Surcharge)

Page \_\_\_\_\_ of \_\_\_\_\_  
 P.O. # \_\_\_\_\_ Quote # \_\_\_\_\_  
 Mail Report To: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Invoice To: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Mail Invoice To: \_\_\_\_\_

ANALYSES REQUESTED  
 TOTAL CO. SUR. PH  
 TOTAL # OF BOTTLES SENT

LABORATORY ID (Lab Use Only)	FIELD ID	COLLECTION		MATRIX	Matrix Codes W=Water S=Soil A=Air C=Charcoal B=Biota Sl=Sludge	Regulatory Program UST RCRA SDWA NPDES CERCLA	Date	Time	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)
		DATE	TIME							
	S-14-1.5'	7/24/03	12:10	S						
	S-15-0.5'		1230							
	S-15-1.0'		1230							
	S-15-1.5'		1230							
	S-16-1.5'		1330							
	S-16-2.0'		1330							
	S-17-1.5'		1400							
	S-17-2.0'		1400							
	S-18-1.5'		1430							
	S-18-2.0'		1430							

Rush Turnaround Time Requested (TAT) - Prelim  
 (Rush TAT subject to approval/surcharge)  
 Date Needed: \_\_\_\_\_  
 Transmit Prelim Rush Results by (circle):  
 Phone Fax E-Mail  
 Phone #: \_\_\_\_\_  
 Fax #: \_\_\_\_\_  
 E-Mail Address: \_\_\_\_\_  
 Samples on HOLD are subject to special pricing and release of liability

Relinquished By: Ron Poppie Date/Time: 7/25/03  
 Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

En Chem Project No. \_\_\_\_\_  
 Sample Receipt Temp. \_\_\_\_\_  
 Sample Receipt pH (Wet/Metals) \_\_\_\_\_  
 Cooler Custody Seal Present / Not Present  
 Intact / Not Intact

**Attachment 3**  
**August 29, 2003 Letter to WDNR**



**Foth & Van Dyke**  
consultants · engineers · scientists

August 29, 2003

Mr. Larry Lynch  
Wisconsin Department of Natural Resources  
101 S. Webster, P.O. Box 7921  
Madison, WI 53707-7921

Dear Mr. Lynch:

Re: Flambeau Mining Company Railroad Spur Investigation

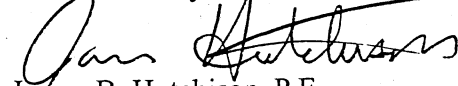
The purpose of this letter is to inform the Wisconsin Department of Natural Resources (WDNR) that additional laboratory testing is being completed on the soil samples obtained during the July 24, 2003 investigation of the Flambeau Mining Company (Flambeau) railroad spur. Attached is a copy of an internal Foth and Van Dyke memorandum that contains a listing of the soil samples and the additional laboratory testing that was ordered. We expect the results late in the week of September 1, 2003.

During internal discussions with representatives of Flambeau it was recognized that soil removal at the railroad spur would be based on the total copper/sulfur/pH results coupled with the potential for the soils to leach copper. The EPA 1312 SPLP testing proposed in the attached memorandum will determine the *leachability* of copper for the range of concentrations exposed along the railroad spur. A report that presents the results of the laboratory testing performed will be submitted to the WDNR for review and approval. The report will describe the methods used to develop the proposed remedial action and the specifications for implementing it. It is the Flambeau's intention to complete the remediation of the railroad spur in 2003 before snowfall.

Please feel free to call or e-mail the undersigned with any questions or comments.

Sincerely,

Foth & Van Dyke and Associates, Inc.

  
James B. Hutchison, P.E.  
*Senior Technical Consultant*

Attachments

cc: Jana Murphy, Flambeau Mining Company  
Fred Fox, Flambeau Mining Company  
Ron Meister, Foth & Van Dyke

J:\scopes\03F002\I-Lynch Flambeau RR Spur Invest.wpd

## Foth & Van Dyke Memorandum

August 26, 2003

TO: Jim Hutchison

CC: Janis Kesy

FR: Ron Meister

RE: Additional Analytical Laboratory Testing of the Rail Spur Soil Samples

This memorandum is prepared as a follow-up to our telephone conference call with representatives of the Flambeau Mining Company the morning of August 25, 2003. During our conference call it was decided to complete additional laboratory testing of the soil below the rail spur to determine the potential *leachability* of copper and sulfur. The following is a listing of the samples we propose to test, along with the pH, copper and sulfur results just received. The listed samples will be tested using EPA method 1312 (SPLP) the samples were selected to reflect the range of copper concentrations.

Sample No.	Depth (ft.)	Copper*	pH (su)	Sulfur*	Est. Qt Smpl
S-11	1	40	6	26	500-1,000g
S-9	1	260	3.5	740	1,000g
S-16	1.5	800	3.1	3991	500 g
S-11	0.5	1600	4.6	10,650	300g

\*results in mg/kg

g = grams

ft. = feet

Est. Qt. Smpl = Estimated quantity of samples available from samples stored at the F&VD laboratory

We have received a quote for the EPA 1312 (SPLP) leaching test for the four samples listed above for copper and sulfur from EnChem Inc. EnChem's cost for completing SPLP for copper and sulfur on these four samples is \$1,340 that is a fast turn around price that would get us results the week of September 1, 2003. If we want the results the week of 9/1/03 we need to get the samples to EnChem today or tomorrow. Approximately 100 grams of sample is required for this test. Please let me know Flambeau's decision as soon as you have received word.

**Attachment 4**  
**EnChem Analytical Report EPA 1312 (SPLP)**





**MASTER FILE COPY**

Scope 03F002 Classification 10,500

Copy To TBHL, REM, MASTER FILE  
Corporate Office & Laboratory

1241 Bellevue Street, Suite 9, Green Bay, WI 54302

920-469-2436, 800-7-ENCHEM, Fax: 920-469-8827

www.enchem.com

**Analytical Report Number: 838124**

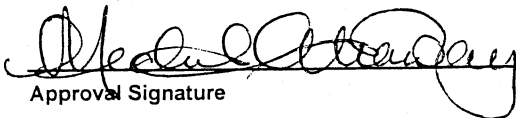
Client : FOTH & VAN DYKE

Project Name : FLAMBEAU MINING CO RR SPUR

Project Number : 03F002

Lab Sample Number	Field ID	Matrix	Collection Date
838124-001	S-11, 1'	SOIL	07/24/03
838124-002	S-9, 1'	SOIL	07/24/03
838124-003	S-16, 1.5'	SOIL	07/24/03
838124-004	S-11, 0.5'	SOIL	07/24/03

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

  
Approval Signature

9/5/03  
Date

En Chem Inc.

1241 Bellevue Street  
Green Bay, WI 54302  
920-469-2436  
800-7-ENCHEM  
Fax: 920-469-8827

---

Analytical Report Number: 838124

Client : FOTH & VAN DYKE  
Project Name : FLAMBEAU MINING CO RR SPUR  
Project Number : 03F002  
Field ID : S-11, 1'

Matrix Type : SOIL  
Collection Date : 07/24/03  
Report Date : 09/03/03  
Lab Sample Number : 838124-001

---

INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Leach Date	Compleat				1			08/27/03	SW846 1312	
Copper - SPLP	0.096	0.00090	0.0030		1	mg/L		08/29/03	SW846 3010A	SW846 6010B
Sulfur-SPLP	3.0	0.14	0.47		1	mg/L	A	09/02/03		SW846 6010B

En Chem Inc.

1241 Bellevue Street  
Green Bay, WI 54302  
920-469-2436  
800-7-ENCHEM  
Fax: 920-469-8827

---

**Analytical Report Number: 838124**

Client : FOTH & VAN DYKE

Matrix Type : SOIL

Project Name : FLAMBEAU MINING CO RR SPUR

Collection Date : 07/24/03

Project Number : 03F002

Report Date : 09/03/03

Field ID : S-9, 1'

Lab Sample Number : 838124-002

---

**INORGANICS**

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Leach Date	Compleat				1			08/27/03	SW846 1312	
Copper - SPLP	0.94	0.00090	0.0030		1	mg/L		08/29/03	SW846 3010A	SW846 6010B
Sulfur-SPLP	7.0	0.14	0.47		1	mg/L	A	09/02/03		SW846 6010B

---

Analytical Report Number: 838124

Client : FOTH & VAN DYKE

Matrix Type : SOIL

Project Name : FLAMBEAU MINING CO RR SPUR

Collection Date : 07/24/03

Project Number : 03F002

Report Date : 09/03/03

Field ID : S-16, 1.5'

Lab Sample Number : 838124-003

---

INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Leach Date	Compleat				1			08/27/03	SW846 1312	
Copper - SPLP	1.4	0.00090	0.0030		1	mg/L		08/29/03	SW846 3010A	SW846 6010B
Sulfur-SPLP	7.9	0.14	0.47		1	mg/L	A	09/02/03		SW846 6010B

En Chem Inc.

1241 Bellevue Street  
Green Bay, WI 54302  
920-469-2436  
800-7-ENCHEM  
Fax: 920-469-8827

---

Analytical Report Number: 838124

Client : FOTH & VAN DYKE

Matrix Type : SOIL

Project Name : FLAMBEAU MINING CO RR SPUR

Collection Date : 07/24/03

Project Number : 03F002

Report Date : 09/03/03

Field ID : S-11, 0.5'

Lab Sample Number : 838124-004

---

INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Analysis Date	Prep Method	Analysis Method
Leach Date	Compleat				1			08/27/03	SW846 1312	
Copper - SPLP	1.0	0.00090	0.0030		1	mg/L		08/29/03	SW846 3010A	SW846 6010B
Sulfur-SPLP	4.9	0.14	0.47		1	mg/L	A	09/02/03		SW846 6010B

# En Chem Inc.

1241 Bellevue Street  
Green Bay, WI 54302  
920-469-2436  
800-7-ENCHEM  
Fax: 920-469-8827

---

Lab Number	TestGroupID	Field ID	Comment
838124	Sulfur	All Samples	A - Analyte is detected in the SPLP blank at a concentration of 2.9 mg/L.

---

## Qualifier Codes

Flag	Applies To	Explanation
A	Inorganic	Analyte is detected in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
B	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
B	Organic	Analyte is present in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
C	All	Elevated detection limit.
D	All	Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
E	Inorganic	Estimated concentration due to matrix interferences. During the metals analysis using the inductively coupled plasma (ICP), the serial dilution failed to meet the established control limits of 0-10% and the sample concentration is greater than 50 times the IDL (100 times the IDL for analysis done on the ICP-MS). The result was flagged with the E qualifier to indicate that a physical interference was observed.
E	Organic	Analyte concentration exceeds calibration range.
F	Inorganic	Due to potential interferences for this analysis by Inductively Coupled Plasma techniques (SW-846 Method 6010), this analyte has been confirmed by and reported from an alternate method.
F	Organic	Surrogate results outside control criteria.
H	All	Preservation, extraction or analysis performed past holding time.
J	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
J	Organic	Concentration detected is greater than the method detection limit but less than the reporting limit.
K	Inorganic	Sample received unpreserved. Sample was either preserved at the time of receipt or at the time of sample preparation.
K	Organic	Detection limit may be elevated due to the presence of an unrequested analyte.
L	All	Elevated detection limit due to low sample volume.
N	All	Spiked sample recovery not within control limits.
P	Organic	The relative percent difference between the two columns for detected concentrations was greater than 40%.
Q	All	The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ). The results are qualified due to the uncertainty of analyte concentrations within this range.
S	Organic	The relative percent difference between quantitation and confirmation columns exceeds internal quality control criteria. Because the result is unconfirmed, it has been reported as a non-detect with an elevated detection limit.
U	All	The analyte was not detected at or above the reporting limit.
V	All	Sample received with headspace.
W	All	A second aliquot of sample was analyzed from a container with headspace.
X	All	See Sample Narrative.
&	All	Laboratory Control Spike recovery not within control limits.
*	All	Precision not within control limits.
<	All	The analyte was not detected at or above the reporting limit.
1	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses passed QC based on precision criteria.
2	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.
3	Inorganic	BOD result is estimated due to the BOD blank exceeding the allowable oxygen depletion.
4	Inorganic	BOD duplicate precision not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
5	Inorganic	BOD result is estimated due to insufficient oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
6	Inorganic	BOD laboratory control sample not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
7	Inorganic	BOD result is estimated due to complete oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.

Test Group Name	838124-001	838124-002	838124-003	838124-004
COPPER - SPLP	G	G	G	G
SPLP - INORGANIC	G	G	G	G
SULFUR	S	S	S	S

Wisconsin Certification	
G = En Chem Green Bay	405132750 / DATCP: 105 000444
K = En Chem Kimberly	445134030
S = Subcontracted Analysis	



## En Chem, Inc. Cooler Receipt Log

Batch No. 838124

Project Name or ID F/Ambreau Mining Co No. of Coolers: 1 Temps: ROI

A. Receipt Phase: Date cooler was opened: 8/27/03 By: cy

- 1: Were samples received on ice? (Must be ≤ 6 C).....  YES  NO<sup>2</sup>
- 2: Was there a Temperature Blank?..... YES  NO
- 3: Were custody seals present and intact? (Record on COC)..... YES  NO
- 4: Are COC documents present?.....  YES  NO<sup>2</sup>
- 5: Does this Project require quick turn around analysis?.....  YES  NO
- 6: Is there any sub-work?.....  YES  NO
- 7: Are there any short hold time tests?..... YES  NO
- 8: Are any samples nearing expiration of hold-time? (Within 2 days)..... YES<sup>1</sup>  NO Contacted by/Who \_\_\_\_\_
- 9: Do any samples need to be Filtered or Preserved in the lab?..... YES<sup>1</sup>  NO Contacted by/Who \_\_\_\_\_

B. Check-in Phase: Date samples were Checked-in: 8/27/03 By: cy

- 1: Were all sample containers listed on the COC received and intact?.....  YES  NO<sup>2</sup>  NA
- 2: Sign the COC as received by En Chem. Completed.....  YES  NO
- 3: Do sample labels match the COC? .....  YES  NO<sup>2</sup>
- 4: Completed pH check on preserved samples.. ..... YES  NO  NA  
*(This statement does not apply to water: VOC, O&G, TOC, DRO, Total Rec. Phenolics)*
- 5: Do samples have correct chemical preservation?..... YES  NO<sup>2</sup>  NA  
*(This statement does not apply to water: VOC, O&G, TOC, DRO, Total Rec. Phenolics)*
- 6: Are dissolved parameters field filtered?..... YES  NO<sup>2</sup>  NA
- 7: Are sample volumes adequate for tests requested? .....  YES  NO<sup>2</sup>
- 8: Are VOC samples free of bubbles >6mm ..... YES  NO<sup>2</sup>  NA
- 9: Enter samples into logbook. Completed.....  YES  NO
- 10: Place laboratory sample number on all containers and COC. Completed.....  YES  NO
- 11: Complete Laboratory Tracking Sheet (LTS). Completed..... YES  NO  NA
- 12: Start Nonconformance form. .... YES  NO  NA
- 13: Initiate Subcontracting procedure. Completed.....  YES  NO  NA
- 14: Check laboratory sample number on all containers and COC. .... JR  YES  NO  NA

**Short Hold-time tests:**

48 Hours or less Coliform (6 hrs) Hexavalent Chromium (24 Hrs) BOD Nitrite or Nitrate Low Level Mercury Ortho Phosphorus Turbidity Surfactants Sulfite En Core Preservation Color	7 days Flashpoint TSS Total Solids TDS Sulfide Free Liquids Total Volatile Solids Aqueous Extractable Organics- ALL Unpreserved VOC's Ash	Footnotes 1 Notify proper lab group immediately. 2 Complete nonconformance memo.
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Rev. 4/11/03, Attachment to 1-REC-5.  
 Subject to QA Audit.

Reviewed by/date \_\_\_\_\_

