

Final Report – Task 1 Mirror lake

Sediment Reduction Project

Prepared for:
City of Mondovi, Wisconsin

Prepared by:
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Roger A Clay

Roger A. Clay, P.E.
Project Manager

30291

P.E. Number

7/30/98

Date

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Sediment Reduction Project

Prepared for City of Mondovi

1.0 Bathymetric Map

In May of 1997 SEH, assisted by students of the Mondovi High School, prepared the Bathymetric Map (Figure 1) found in the pocket of this report. The bathymetric map was subsequently used to prepare a preliminary plan for a dredge cut (Figure 2) to allow completion of a preliminary cost estimate. This preliminary plan is also found in the pocket.

The survey confirmed what many people had expected. Both sediment traps at inlet streams had filled with sediment as had much of the upper half of the lake. There are signs of infilling of the lower half of the lake as well.

2.0 Sediment Sampling

Sediment samples from Mirror Lake were obtained and analyzed. SEH attempted to collect the samples from a boat in September 1997 but found the sediment to be very dense, apparently from consolidation. Sediment recoveries were possible to a depth of approximately 1 foot, which was not adequate to meet Wisconsin Department of Natural Resources (WDNR) sampling requirements. It was necessary to return after freeze up and use a drill rig through the ice to obtain the required samples.

Sampling of the sediments with a drill rig was accomplished in February 1998. Samples obtained were submitted for physical and chemical analysis in accordance with WDNR requirements. Physical test results are in Appendix A and chemical test results are in Appendix B.

3.0 Test Results

The chemical tests showed a moderate level of ammonia and kjeldahl nitrogen in the sediments. The tests also revealed arsenic at levels exceeding the human risk health standards contained in Wisconsin Administrative Rule NR 720.

The presence of these chemicals will place limitations on disposal of the dredged material. The presence of nitrogen will require that the disposal area, particularly since hydraulic dredging methods are preferred, to be a sufficient distance from private wells to eliminate or minimize the risk of contamination of private drinking water sources. The presence of arsenic, even though it is similar to natural background levels, will require the disposal area be licensed as a solid waste disposal area, or be granted an exemption from the licensing process.

4.0 Preliminary Cost Estimate

A preliminary cost estimate, found in Appendix 3, was prepared assuming a 40,000 to 45,000 cubic yard hydraulic dredging project and a disposal site located in the City of Mondovi industrial park. The size of the project corresponds to the preliminary dredge cut layout found in the pocket of this report.

Two small upland valleys in the northwest area of the industrial site would be use for the disposal area. Neither valley supports a "water of the state," which means neither WDNR dam safety nor water regulation requirements apply to the location. The northern most valley would be the primary containment area and have a 40 to 50 foot high embankment constructed to hold the sediment slurry. The southern valley would have a much smaller 10 to 15 foot high embankment constructed to create a secondary settling chamber. Approximately 50,000 cubic yards of fill would be needed to create the embankments assuming clay soils are used. It is anticipated the required type and quantity of fill can be obtained from nearby areas of the industrial park, though geotechnical testing will be required to confirm this. A letter regarding geotechnical engineering considerations is found in Appendix 4.

5.0 Preliminary Approval of Disposal Site Location by WDNR

A project meeting was held on January 21, 1998 at the WDNR office in Eau Claire to discuss the proposed sediment containment site location. After the meeting, requested physical and chemical test data for the sediments, along with information on disposal site location, septic systems and drinking water wells near the proposal site, depth to groundwater at the disposal and other information were submitted to

WDNR for review. Subsequent to their review of the data the WDNR issued a letter of approval for the disposal site location, which is found in Appendix 5. The approval is conditioned on sampling of 4 private wells prior to project construction as well as the understanding that the City of Mondovi Industrial Park receives drinking water from the municipal supply.

Appendix A

Physical Data for Mirror Lake Sediments

DAILY PROJECT STATUS REPORT

Report No:

Date: Sept. 25, 1997

Project No: MONDO9603

Summary of Work Performed

Kevin Accola and I collected sediment samples from several locations in Mirror Lake in Mondovi, Wi. Two sediment cores were collected from the upstream portion of Area 1 as depicted on the attached map. A 5 gallon bucket of sediments was also collected at this location. The water depth in this location was deeper than anticipated (approximately 4 to 5 feet). Approximately 1 foot of relatively soft organic sediments were encountered at these locations. The deeper sediments were dense, and could not be penetrated with the hand operated sampling equipment being used. Some silty fine to medium quartz sand was collected from below the organics at the southern core location. Total recoveries at these locations ranged from 1.1 to 1.2 feet. One core sample was collected from Area 1, downstream. Water depth was approximately 7 ft. Approximately 3 ft of penetration and 2.2 ft of sample recovery were attained. The sample consisted of black organic silt. One core sample was collected from Area 3. Water depth was 3 ft, penetration was approximately 4 ft, and sample recovery was 2.2 ft. The sample consisted of 1.7 ft. of black organic silt, and 0.5 ft of silty quartz sand. A 5 gallon bucket of sediment was also collected at this location.

Major Equipment on Project

Threaded PVC sampling pipe, boat, aluminum probe handles, tape measure, sample bags, cooler, ice, plastic sheeting, sledgehammer and wood block (for advancing pipe).

Number of Personnel on Project

Superintendent	_____	Laborers	_____
Foremen	_____	Others	K. Accola, J. Guhl
Operators	_____	Hours Worked	4 (field)

Weather Conditions

Temperature: 65 F

Precipitation: None

Sky Condition: Clear

Construction Delays

Dense sediments limited the effectiveness of hand sampling equipment. Obtaining deeper samples would likely best be accomplished using a hydraulic probe sampler or a drill rig through the ice in winter.

Remarks

Shallow sediment depths depicted on map in upstream Area 1 should be checked for accuracy.

JEG/jeg/KEA



DAILY PROJECT STATUS REPORT

Report No:

Date: Feb. 06, 1998

Project No: A MONDO 9603

Summary of Work Performed

SEH provided oversight of hydraulic probe sediment sample collection at Mirror Lake in Mondovi, Wisconsin today. Sediment samples were collected at three locations (see attached sketch). Soil boring logs were prepared for each hydraulic probe boring. Sediment samples were retained in the polyethylene sampling sleeves, and were retained by SEH for potential analysis. Sample intervals were as follows:

HP-1, 0-8 ft below lake bottom (2 samples). Water depth = 8.0 ft.

HP-2, 0-8 ft below lake bottom (1 spl), 0-4 ft below lake bottom (1 spl). Water depth = 6.0 ft.

HP-3, 0-4.5 ft below lake bottom (2 samples). Water depth = 4.5 ft.

Major Equipment on Project

Bobcat-mounted hydraulic probe sampler, Macro core sampler.

Number of Personnel on Project

Superintendent	_____	Laborers	_____
Foremen	_____	Others	John Guhl (SEH)
Operators	Kevin McGilp	Hours Worked	3

Weather Conditions

Temperature: 25 F

Precipitation: None

Sky Condition: Clear

Construction Delays

Remarks



Facility/Project Name Mirror Lake Sediment Study			License/Permit/Monitoring Number		Boring Number HP-1
Boring Drilled By (Firm name and name of crew chief) Matrix Technology / Kevin McGilp			Date Drilling Started 2/6/98	Date Drilling Completed 2/6/98	Drilling Method Hydraulic Probe
DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation Feet MSL	Borehole Diameter 2.0 Inches
Boring Location State Plane 1/4 of 1/4 of Section			Lat 0' "	Local Grid Location (If applicable) <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
County Buffalo		DNR County Code	Civil Town/City/ or Village Mondovi		

Sample Number	Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
1	24		0 - 8	Mirror Lake Surface Water										
			8 - 16	Brown Organic CLAY	OL									
			16.0	Gray Silty Sand in Bottom One-Half Inch of Sample End of Boring @ 16.0 ft. Below Lake Surface										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

John E. Gull

Firm



SEH 421 Frenette Drive
Chippewa Falls, WI. 54729
Tel: 715-720-6200, Fax: 715-720-6300

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Facility/Project Name Mirror Lake Sediment Study			License/Permit/Monitoring Number		Boring Number HP-2
Boring Drilled By (Firm name and name of crew chief) Maxim Technology / Kevin McGilp			Date Drilling Started 2/6/98	Date Drilling Completed 2/6/98	Drilling Method Hydraulic Probe
DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation Feet MSL	Borehole Diameter 2.0 Inches
Boring Location State Plane 1/4 of 1/4 of Section			N, E T N,R	Lat 0' "	Local Grid Location (If applicable) <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W
County Buffalo		DNR County Code	Civil Town/City/ or Village Mondovi		


Sample Number	Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200		
			0	Mirror Lake Surface Water											
1	24		6	Brown Organic CLAY	OL										
2	46		10	Brown Organic CLAY, Occasional Thin Layers of Silty Sand	OL										
			14	Gray Silty Sand in Bottom Three Inches of Sample End of Boring @ 14 ft. Below Lake Surface											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *John E. Gubel* Firm: **SEH** SEH 421 Frenette Drive
Chippewa Falls, WI. 54729
Tel: 715-720-6200, Fax: 715-720-6300

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Facility/Project Name Mirror Lake Sediment Study			License/Permit/Monitoring Number		Boring Number HP-3	
Boring Drilled By (Firm name and name of crew chief) Matrix Technology / Kevin McGilp			Date Drilling Started 2/6/98		Date Drilling Completed 2/6/98	
DNR Facility Well No.			WI Unique Well No.		Common Well Name	
Final Static Water Level Feet MSL			Surface Elevation Feet MSL		Borehole Diameter 2.0 Inches	
Boring Location State Plane 1/4 of 1/4 of Section			N, E T N,R		Local Grid Location (If applicable) Lat 0' " Long 0' " <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
County Buffalo			DNR County Code		Civil Town/City/ or Village Mondovi	

Sample Number	Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
1	24		0 - 2	Mirror Lake Surface Water										
			2 - 9.0	Brown Organic CLAY	OL									
			9.0 - 9.0	End of Boring @ 9.0 ft. Below Lake Surface										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

John C. Gilp

Firm



SEH 421 Frenette Drive
Chippewa Falls, WI. 54729
Tel: 715-720-6200, Fax: 715-720-6300

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SOIL ORGANIC CONTENT

Project Name: Mirror Lake Sediment Study

Project Number: MONDO9603

Technician: J. Thornton

Date: 2/18/98

Sample ID Depth	Area #1	Area #3			
Dry Soil + Tare	100.19	148.93			
Ash + Tare	97.86	137.69			
Tare	76.23	71.76			
Organic	9.7%	14.6%			

Sample ID Depth					
Dry Soil + Tare					
Ash + Tare					
Tare					
Organic					

Sample ID Depth					
Dry Soil + Tare					
Ash + Tare					
Tare					
Organic					

Sample ID Depth					
Dry Soil + Tare					
Ash + Tare					
Tare					
Organic					

u ASTM 107/101



MEMORANDUM

□ ST. PAUL, MN □ MINNEAPOLIS, MN □ ST. CLOUD, MN ■ CHIPPEWA FALLS, WI □ MADISON, WI □ GRIFFITH, IN

TO: Roger Clay

FROM: Glenn Bruxvoort *GB*

DATE: February 16, 1998

RE: Mirror Lake Sediment Study Soils Results

Enclosed are the results of soils lab analyses performed on samples from your Mirror Lake Sediment Study Project (Project No. MONDO9603.00). The samples were analyzed in general accordance with ASTM D422 standards.

Unless you request differently, the remaining samples will be discarded in 30 days in accordance with our standard policy. If you require additional information or have further questions please call me.

JJT/jjt/GPB

EH, Inc
Chippewa Falls

DATE TIME
printing FEB1698 13:54
Last update FEB1698 13:49

PROJECT ID MIROR
POINT ID S
DEPTH 532.00

Sieve Analysis - ADDRESS 2305

With unsplit specimens use COARSE
fields. With splitting supply TOTAL
PC WT or WT PASSING split sieve.

NAME	SIZE mm	SOIL+TARE	%FINER
{05} #40	.425	0.06	100.0
{06} #60	.250	0.2	99.9
{07} #100	.150	0.57	99.8
{08} #200	.075	2.84	99.1

{01} TOTAL SPECIMEN WEIGHT 328.9
WT PASSING SPLIT SIEVE 326.06
FINE WEIGHT TESTED
MC OF WTS ABOVE SV TARE Wts
{02} {03}
COARSE FINE COARSE 0
WT+T FINE 0
DY+T NON-PLAST?(X)
RE 0
%
{04} NORMALIZE TO 3"(X) X WT METH(CI) C
SPLIT ON mm SIEVE
SIEVING MC (W/D) Coarse D Fine D

SIEVE ANALYSIS OF SOIL

PROJECT MIRROR LAKE SEDIMENTATION PAGE S-532

SAMPLE LOCATION AREA #1 ^{Study} TESTED BY _____

SAMPLE DESCRIPTION _____

SIEVE SIZE	WT. RETAINED	% PASSING
16	0.0	
40	0.06	
60	0.20	
100	0.57	
200	2.84	

SAMPLE SIZE 328.9

H, Inc
Chippewa Falls

DATE TIME
printing FEB1698 13:54
Last update FEB1698 13:51

PROJECT ID MIROR
POINT ID S _____
DEPTH _533.00

Sieve Analysis - ADDRESS 2305

	NAME	SIZE mm	SOIL+TARE	%FINER
With unsplit specimens use COARSE fields. With splitting supply TOTAL PC WT or WT PASSING split sieve.	{05} #10	2.000	0.0	100.0
	{06} #16	1.180	0.6	99.8
	{07} #40	.425	5.56	98.4
{01} TOTAL SPECIMEN WEIGHT 340.2	{08} #60	.250	19.32	94.3
WT PASSING SPLIT SIEVE 297.76	{09} #100	.150	36.49	89.3
FINE WEIGHT TESTED _____	{10} #200	.075	42.44	87.5
MC OF WTS ABOVE SV TARE WTs	{11}			
{02} {03}	{12}			
COARSE FINE COARSE 0	{13}			
WT FINE 0	{14}			
DY+T NON-PLAST?(X)	{15}			
RE 0	{16}			
%	{17}			
{04} NORMALIZE TO 3"(X) X WT METH(CI) C	{18}			
SPLIT ON _____ mm SIEVE	{19}			
SIEVING MC (W/D) Coarse D Fine D	{20}			

SIEVE ANALYSIS OF SOIL

PROJECT MIRROR LAKE SEDIMENTATION STUDY

PAGE S-533

SAMPLE LOCATION AREA #3

TESTED BY _____

SAMPLE DESCRIPTION _____


SIEVE SIZE	WT. RETAINED	% PASSING
10	0.0	
16	0.6	
40	5.56	
60	19.32	
100	36.49	
200	42.44	

SAMPLE SIZE 340.2

Appendix B

Chemical Data for Mirror Lake Sediments

Short Elliott Hendrickson Inc
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: MONDO9603
SAMPLED BY: Client
DATE REC'D: 02/10/98
REPORT DATE: 03/12/98
PREPARED BY: BMS
REVIEWED BY: 

Attn: Roger Clay

	<u>Units</u>	<u>Reporting Limit</u>	<u>HP-1 0'</u> <u>02/06/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 160.3</u> Total Solids	%	-	68.9		02/13/98	LCK
<u>EPA 350.2</u> Ammonia N	mg/kg	8.1	196.		02/11/98	GAG
<u>EPA 351.2</u> Total Kjeldahl Nitrogen	mg/kg	190.	1,890.		02/11/98	GAG
Analytical No.:			27321			

Results calculated on a dry weight basis.

	<u>Units</u>	<u>Reporting Limit</u>	<u>HP-1 8'</u> <u>02/06/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 160.3</u> Total Solids	%	-	71.2		02/13/98	LCK
<u>EPA 350.2</u> Ammonia N	mg/kg	7.9	274.		02/11/98	GAG
<u>EPA 351.2</u> Total Kjeldahl Nitrogen	mg/kg	180.	1,670.		02/11/98	GAG
Analytical No.:			27322			

Results calculated on a dry weight basis.

Short Elliott Hendrickson Inc
421 Frenette Drive
Chippewa Falls, WI 54729

CUST NUMBER: MONDO9603
SAMPLED BY: Client
DATE REC'D: 02/10/98
REPORT DATE: 03/12/98
PREPARED BY: BMS
REVIEWED BY: *[Signature]*

Attn: Roger Clay

	Units	Reporting Limit	HP-2 0' 02/06/98	Qualifiers	Date Analyzed	By
<u>EPA 160.3</u>						
Total Solids	%	-	65.0		02/13/98	LCK
<u>EPA 350.2</u>						
Ammonia N	mg/kg	8.6	334.		02/11/98	GAG
<u>EPA 351.2</u>						
Total Kjeldahl Nitrogen	mg/kg	200.	2,230.		02/11/98	GAG
<u>EPA 365.4</u>						
Total Phosphorus	mg/kg	45.	1,690.	*	03/10/98	GAG
<u>EPA 6010</u>						
Arsenic	mg/kg	0.15	9.91		02/24/98	BMS
Cadmium	mg/kg	0.15	0.28		02/26/98	BMS
Chromium	mg/kg	0.05	17.1		02/24/98	BMS
Copper	mg/kg	0.11	12.5		02/24/98	BMS
Lead	mg/kg	0.82	9.82		02/24/98	BMS
Nickel	mg/kg	0.14	14.6		02/24/98	BMS
Zinc	mg/kg	0.5	51.5		02/24/98	BMS
<u>EPA 7471</u>						
Mercury	mg/kg	0.03	0.048		02/27/98	JCH
<u>EPA 8081</u>						
Solid Organic Extraction		-	-		02/20/98	CKV
PCB-1016	mg/kg	1.1	X		02/25/98	CKV
PCB-1221	mg/kg	1.1	X		02/25/98	CKV
PCB-1232	mg/kg	1.1	X		02/25/98	CKV
PCB-1242	mg/kg	1.1	X		02/25/98	CKV
PCB-1248	mg/kg	1.1	X		02/25/98	CKV
PCB-1254	mg/kg	1.1	X		02/25/98	CKV
PCB-1260	mg/kg	1.1	X		02/25/98	CKV
g-BHC (Lindane)	mg/kg	0.011	X		02/25/98	CKV
4,4'-DDD	mg/kg	0.062	X		02/25/98	CKV
4,4'-DDE	mg/kg	0.02	X		02/25/98	CKV
4,4'-DDT	mg/kg	0.062	X		02/25/98	CKV
Dieldrin	mg/kg	0.02	X		02/25/98	CKV
Methoxychlor	mg/kg	0.1	X		02/25/98	CKV

Analytical No.: 27323

X = Analyzed but not detected.
Results calculated on a dry weight basis.

* The phosphorus analysis exceeded the holding time for a liquid sample.

Short Elliott Hendrickson Inc
421 Frenette Drive
Chippewa Falls , WI 54729


CUST NUMBER: MONDO9603
SAMPLED BY: Client
DATE REC'D: 02/10/98
REPORT DATE: 03/12/98
PREPARED BY: BMS
REVIEWED BY: *[Signature]*

Attn: Roger Clay

	<u>Units</u>	<u>Reporting Limit</u>	<u>HP-2 4' 02/06/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 160.3</u> Total Solids	%	-	69.3		02/13/98	LCK
<u>EPA 350.2</u> Ammonia N	mg/kg	8.1	29.1		02/11/98	GAG
<u>EPA 351.2</u> Total Kjeldahl Nitrogen	mg/kg	190.	2,090.		02/11/98	GAG
Analytical No.:			27324			

Results calculated on a dry weight basis.

Short Elliott Hendrickson Inc
 421 Frenette Drive
 Chippewa Falls , WI 54729

CUST NUMBER: MONDO9603
 SAMPLED BY: Client
 DATE REC'D: 02/10/98
 REPORT DATE: 03/12/98
 PREPARED BY: BMS
 REVIEWED BY: 

Attn: Roger Clay


	Units	Reporting Limit	HP-2 8' 02/06/98	Qualifiers	Date Analyzed	By
EPA 160.3						
Total Solids	%	-	70.0		02/13/98	LCK
EPA 350.2						
Ammonia N	mg/kg	8.0	246.		02/11/98	GAG
EPA 351.2						
Total Kjeldahl Nitrogen	mg/kg	180.	1,930.		02/11/98	GAG
EPA 365.4						
Total Phosphorus	mg/kg	42.	2,360.	*	03/10/98	GAG
EPA 6010						
Arsenic	mg/kg	0.14	8.37		02/24/98	BMS
Cadmium	mg/kg	0.14	0.16		02/26/98	BMS
Chromium	mg/kg	0.05	12.6		02/24/98	BMS
Copper	mg/kg	0.1	7.09		02/24/98	BMS
Lead	mg/kg	0.76	5.57		02/24/98	BMS
Nickel	mg/kg	0.13	9.04		02/24/98	BMS
Zinc	mg/kg	0.47	32.9		02/24/98	BMS
EPA 7471						
Mercury	mg/kg	0.03	0.048		02/27/98	JCH
EPA 8081						
Solid Organic Extraction		-	-		02/20/98	CKV
PCB-1016	mg/kg	1.0	X		02/25/98	CKV
PCB-1221	mg/kg	1.0	X		02/25/98	CKV
PCB-1232	mg/kg	1.0	X		02/25/98	CKV
PCB-1242	mg/kg	1.0	X		02/25/98	CKV
PCB-1248	mg/kg	1.0	X		02/25/98	CKV
PCB-1254	mg/kg	1.0	X		02/25/98	CKV
PCB-1260	mg/kg	1.0	X		02/25/98	CKV
g-BHC (Lindane)	mg/kg	0.01	X		02/25/98	CKV
4,4'-DDD	mg/kg	0.057	X		02/25/98	CKV
4,4'-DDE	mg/kg	0.019	X		02/25/98	CKV
4,4'-DDT	mg/kg	0.057	X		02/25/98	CKV
Dieldrin	mg/kg	0.019	X		02/25/98	CKV
Methoxychlor	mg/kg	0.1	X		02/25/98	CKV

Analytical No.: 27325

X = Analyzed but not detected.
 Results calculated on a dry weight basis.

* The phosphorus analysis exceeded the holding time for a liquid sample.

Short Elliott Hendrickson Inc
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: MONDO9603
SAMPLED BY: Client
DATE REC'D: 02/10/98
REPORT DATE: 03/12/98
PREPARED BY: BMS
REVIEWED BY: 

Attn: Roger Clay

	<u>Units</u>	<u>Reporting Limit</u>	<u>HP-3 0' 02/06/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 160.3</u> Total Solids	%	-	64.4		02/13/98	LCK
<u>EPA 350.2</u> Ammonia N	mg/kg	8.7	303.		02/11/98	GAG
<u>EPA 351.2</u> Total Kjeldahl Nitrogen	mg/kg	200.	1,740.		02/11/98	GAG
Analytical No.:			27326			

Results calculated on a dry weight basis.

	<u>Units</u>	<u>Reporting Limit</u>	<u>HP-3 4.5' 02/06/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 160.3</u> Total Solids	%	-	73.0		02/13/98	LCK
<u>EPA 350.2</u> Ammonia N	mg/kg	7.7	164.		02/11/98	GAG
<u>EPA 351.2</u> Total Kjeldahl Nitrogen	mg/kg	180.	1,450.		02/11/98	GAG
Analytical No.:			27327			

Results calculated on a dry weight basis.