Final Report - Task 1 Mirror lake

Sediment Reduction Project

Prepared for: City of Mondovi, Wisconsin

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P.E. Number

Project Manager

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Preliminary WDNR Approval of Disposal Site Location

Appendix E

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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					
from the upstream portion of Are The water depth in this location v sediments were encountered at th sampling equipment being used. location. Total recoveries at thes depth was approximately 7 ft. Ap black organic silt. One core san	ment samples from several locations a 1 as depicted on the attached map. vas deeper than anticipated (approximate locations). The deeper sediments Some silty fine to medium quartz sate locations ranged from 1.1 to 1.2 feroproximately 3 ft of penetration and apple was collected from Area 3. Was consisted of 1.7 ft. of black organic streams.	A 5 gallon nately 4 to 5 were dense, nd was colle et. One core 2.2 ft of sam er depth wa	bucket of sedings feet). Approximately, and could not ected from belower sample was comple recovery was 3 ft, penetrati	ments was also collectimately 1 foot of re- be penetrated with we the organics at the ollected from Area were attained. The soon was approximat	ected at this location. clatively soft organic the hand operated he southern core 1, downstream. Water nample consisted of ely 4 ft, and sample
Major Equipment on Project		_			
Threaded PVC sampling pi	pe, boat, aluminum probe han	dles, tape	measure, sa	mple bags, cool	er, ice, plastic
sheeting, sledgehammer an	d wood block (for advancing)	pipe).			
Number of Personnel on Project Superintendent Foremen		Labo Othe		K. Accola, J. (
Operators			s Worked	4 (field)	
Weather Conditions					
Temperature: 65 F	Precipitation: None		Sky	Condition: Clea	ar
•					
Construction Delays					
	e effectiveness of hand sampl	•		•	iples would likely
best be accomplished usin	a hydraulic probe sampler or a	drill rig t	through the i	ice in winter.	
Remarks					
	epicted on map in upstream A	rea 1 shoi	uld be check	ed for accuracy.	
Diame : Dominion departs d					
JEG/jeg/KEA					



DAILY PROJECT STATUS REPORT

Report No:		Date:	Feb. 06, 1998	Project No: A MONDO9603
Summary of Work Perform	ed			
SEH provided oversite	of hydraulic probe sedin	nent sample	e collection at Mirro	or Lake in Mondovi, Wisconsin
today. Sediment samp	les were collected at thre	e locations	(see attached sketch	h). Soil boring logs were prepared
for each hydraulic prob	e boring. Sediment sam	ples were r	etained in the polye	thylene sampling sleeves, and were
retained by SEH for po	tential analysis. Sample	intervals w	ere as follows:	
HP-1, 0-8 ft belo	w lake bottom (2 sample	s). Water d	lepth = 8.0 ft.	
HP-2, 0-8 ft below	w lake bottom (1 spl), 0-	4 ft below l	ake bottom (1 spl).	Water depth = 6.0 ft.
HP-3, 0-4.5 ft be	low lake bottom (2 samp	les). Water	depth = 4.5 ft.	
Number of Personnel on Pro				
Superintend	lent		Laborers	I-la Call (CEII)
Foremen Operators	Kevin McGilp		Others Hours Worked	John Guhl (SEH)
Weather Conditions				
Temperature: 25 F	Precipitation Precipitation	on: None	Sky	Condition: Clear
Construction Delays				



Remarks

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Signature S H. O.

#SEH

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.

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

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

Signature

Firm _SEH

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.

SOIL ORGANIC CONTENT

Project Name: Mirror Lake Sediment Study Project Number: MONDO9603 Technician: J. Thornton Date: 2/18/98

Sample ID	Area #1	Area #3		
Depth				
D C 1 . T	100.10	140.02		
Dry Soil + Tare	100.19	148.93		
Ash+Tare	97.86	137.69		
Tare	76.23	71.76	3	
Organic	9.7%	14.6%		
_				
Sample ID				
Depth				
D 0 11 T		THE CO.		
Dry Soil + Tare				
Ash+Tare				
Tare				
Organic				
Sample ID				
Depth				
Dry Soil + Tare				
Ash+Tare				
Tare				
Organic				
Sample ID				
Depth		_		
Der Sail Tara				
Dry Soil + Tare				
Ash+Tare				
Tare				
Organic		-		



MEMORANDUM

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

TO: Roger Clay

FROM: Glenn Bruxvoort

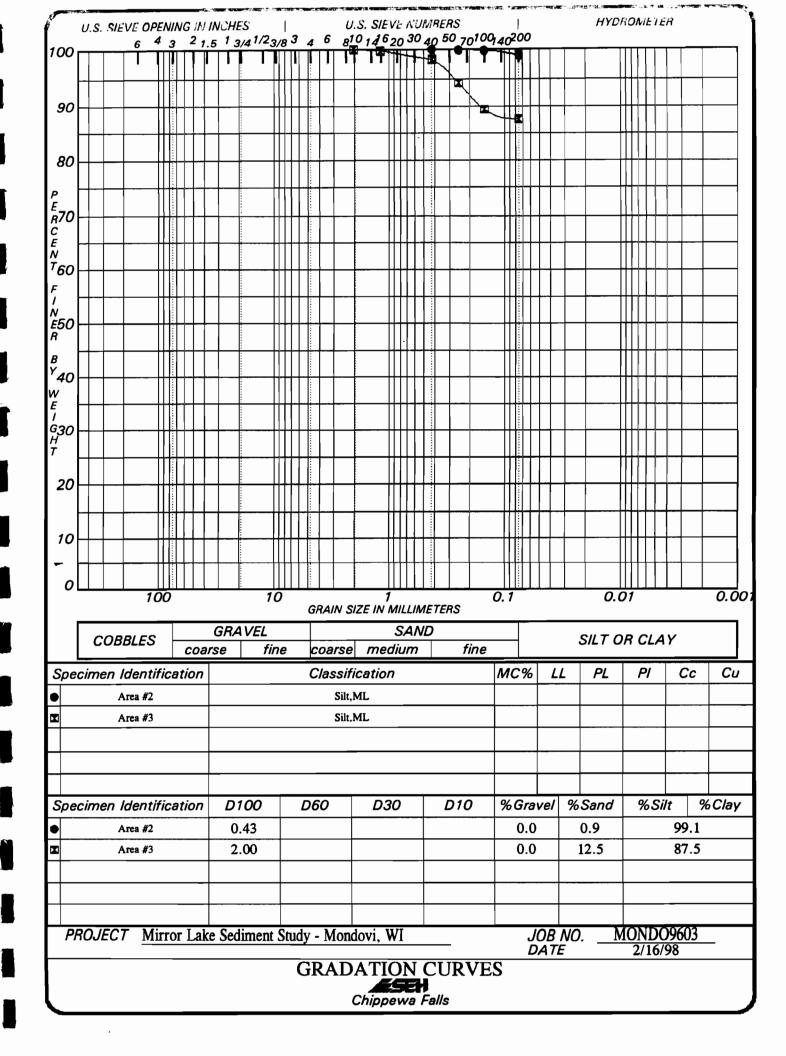
DATE: February 16, 1998

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



H, Inc cnippewa Falls

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

		PROJ	CT ID	MIROR	
		POIN	T ID	s	
		DEPTI	1	532.00	
Sieve Analysis	- ADDRE	SS 230	05		
with unsplit specimens use COARSE `	N	IAME	SIZE mm	SOIL+TARE	%FINER
`fields. With splitting supply TOTAL`	{05} #	40	425	0.06	100.0
PC WT or WT PASSING split sieve.	{06} #	60	250	0.2	_99.9
,	(07) #	100_	150	0.57	_99.8
(01)TOTAL SPECIMEN WEIGHT 328.9	{08} #	200_	075	2.84	_99.1
WT PASSING SPLIT SIEVE 326.06_	{09}				
FINE WEIGHT TESTED	{10}				
MC OF WTS ABOVE ` ` SV TARE WTS `	{11}				
(02) (03)	{12}				
COARSE FINE COARSE 0	{13}				
##+T FINE O	{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 \$1EYE	{1 9}				
SIEVING MC (W/D) Coarse D Fine D	{20}				

SIEVE ANALYSIS OF SOIL

	MIRROR LAKE TO ATION AREA #	STURY	PAGETESTED BY	5-532
SAME DE				
	SIEVE SIZE	WT. RETAINED	% PASSING	
	16	0.6		
	40	0.06		

16		
40	0.06	
60	0.20	
100	0.57	
700	2.84	
_		

SAMPLE SIZE 328.9	
-------------------	--



H, Inc Chippewa Falls

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

	PRO	JECT ID	MIROR	
-	POII	NT ID	s	
:	DEP.	ТН	533.00	
Sieve Analysis	- ADDRESS 2	305		
with unsplit specimens use COARSE `	NAME	SIZE mm	SOIL+TARE	%FINER
fields. With splitting supply TOTAL	(05) #10	_2.000	0.0	100.0
PC WT or WT PASSING split sieve.	(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
T 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)	{12}			
COARSE FINE COARSE 0	{13}			
#+T FINE O	(14)			
Y+T NON-PLAST?(X) _	{15}			
RE 0	{16}			
×	{17}			
O4>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 MIRRER LAKE SODIMONTATION STUDY	PAGE
	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	
		· e

SAMPLE SIZE	340.Z	



Appendix B

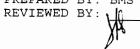
Chemical Data for Mirror Lake Sediments

U.S.FILTER

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

Attn: Roger Clay

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



TD. 160 3	<u>Units</u>	Reporting Limit	HP-1 0' 02/06/98	<u>Qualifier</u> s	Date <u>An</u> alyzed	Ву
Total Solids	%	-	68.9		02/13/98	LCK
EPA 350.2 Ammonia N	mg/kg	8.1	196.		02/11/98	GAG
EPA 351.2 Total Kjeldahl Nitrogen	mg/kg	190.	1,890.		02/11/98	GAG
Analytical No.:			27321			

Results calculated on a dry weight basis.

160 0	<u>Units</u>	Reporting Limit	HP-1 8' 02/06/98	<u>Qualifier</u> s	Date Analyzed	<u>B</u> y
EPA 160.3 Total Solids	%	-	71.2		02/13/98	LCK
EPA 350.2 Ammonia N	mg/kg	7.9	274.		02/11/98	GAG
EPA 351.2 Total Kjeldahl Nitrogen	mg/kg	180.	1,670.		02/11/98	GAG
Analytical No.:			27322			

Results calculated on a dry weight basis.

U.S.FILTER

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: \\(\begin{align*}\begin{align*}\limits & \limits &

Attn: Roger Clay

					<i>P</i>	
		Reporting	HP-2 0'		Date	
	Units	Limit	02/06/98	Qualifiers	Analyzed	Ву
EPA 160.3					, , , , , , , , , , , , , , , , , , ,	
Total Solids	8	-	65.0		02/13/98	LCK
EPA_350.2						
Ammonia N	mg/kg	8.6	334.		02/11/98	GAG
EPA 351.2 Total Kjeldahl Nitrogen	mg/kg	200.	2,230.		02/11/98	GAG
- Total Kjeldani Nitrogen	ilig/kg	200.	2,230.		02/11/98	GAG
EPA 365.4						
Total Phosphorus	mg/kg	45.	1,690.	*	03/10/98	GAG
•						
EPA 6010	4-					
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
EPA 7471_						
Mercury	mg/kg	0.03	0.048		02/27/98	JCH
Heredry	mg/ xg	0.03	0.040		02/2//90	UCH
EPA 8081						
Solid Organic Extraction		_	-		02/20/98	CKV
PCB-1016	mg/kg	1.1	Х		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	0.0.11	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	0.002	X		02/25/98	CKV
Methoxychlor	mg/kg	0.02	X		02/25/98	CKV
	7 7.5	· · ·	Λ		02/23/96	CICV
-						

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

Analytical No.:

27323

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

CUST NUMBER: MONDO9603

U.S.FILTER

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

SAMPLED BY: Client DATE REC'D: 02/10/98 REPORT DATE: 03/12/98

PREPARED BY: BMS REVIEWED BY: \ \n

Attn: Roger Clay

]	<u>Units</u>	Reporting Limit	HP-2 4' 02/06/98	<u>Qualifier</u> s	Date Analyzed	Ву
EPA 160.3 Total Solids	ુ	-	69.3		02/13/98	LCK
EPA_350.2 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.

U.S.FILTER

Short Elliott Hendrickson Inc

421 Frenette Drive

Chippewa Falls , WI 54729

Attn: Roger Clay

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

PREPARED BY: BMS REVIEWED BY: \\(\int\)

	Units	Reporting Limit	HP-2 8' 02/06/98	<u> Qualifier</u> s	Date <u>Analyzed</u>	<u>B</u> y
EPA 160.3 Total Solids	96	-	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 Cadmium Chromium Copper Lead Nickel Zinc	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.14 0.14 0.05 0.1 0.76 0.13 0.47	8.37 0.16 12.6 7.09 5.57 9.04 32.9		02/24/98 02/26/98 02/24/98 02/24/98 02/24/98 02/24/98 02/24/98	BMS BMS BMS BMS BMS BMS
EPA 7471 Mercury	mg/kg	0.03	0.048		02/27/98	JCH
EPA 8081 Solid Organic Extraction PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 PCB-1260 g-BHC (Lindane) 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin Methoxychlor	mg/kg	1.0 1.0 1.0 1.0 1.0 1.0 0.01 0.057 0.019 0.057 0.019	- X X X X X X X X X X		02/20/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98 02/25/98	CKV CKV CKV CKV CKV CKV CKV CKV

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

Analytical No.:

27325

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



Short Elliott Hendrickson Inc 421 Frenette Drive

Chippewa Falls , WI 54729

Attn: Roger Clay

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

REVIEWED BY: BMS

	Units	ReportingLimit	HP-3 0' 02/06/98	Qualifiers	Date Analyzed	Ву
EPA 160.3 Total Solids	ુ	-	64.4		02/13/98	LCK
EPA 350.2 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.

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

Results calculated on a dry weight basis.