MEMORANDUM
SUMMARY OF FIRST ROUND GROUND WATER SAMPLING CHEMICAL RESULTS

Algoma Landfill Remedial Investigation
Algoma, Wisconsin

March 27, 1989

USEPA Docket No. V-W-87-C-036

Prepared by: RMT, Inc.

This memorandum summarizes the results of chemical analyses from the first round of ground water sampling at the Algoma Landfill, Algoma, Wisconsin. The memorandum is provided by the Respondents and RMT as agreed during the July 21, 1988, meeting in Algoma, Wisconsin attended by the Respondents, RMT, the USEPA, and the WDNR.

Objective

The objective of this memorandum is to present the first round of sampling results for the monitoring well and private residence well samples collected during the last week of January 1989. The memorandum includes a discussion of the results and recommendations for the analytical program for the second sampling round.

Discussion

The analytical results from the first round of ground water sampling were received by RMT during the week of March 6, 1989. Detected parameters are listed in Tables 1 through 4.

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The results from the volatile organic compound (VOC) analyses on the monitoring well and private residence well samples are presented in Table 1. These results show that only OW-10 had a concentration of a VOC that was above the instrument detection limit and was significantly above the concentration measured in an associated blank. There were no VOCs reported in residential wells, with the exception of methylene chloride, a laboratory contaminant.

The VOC in OW-10 was 1,1,1-trichloroethane (TCA) at a concentration of 18 ug/l. All other reported concentrations were below instrument detection limits or were found in comparable concentrations in the blank. Benzene was reported in two samples (OW-5R and OW-9) as well as the duplicate of one of these samples (OW-9 duplicate) at concentrations of 1 and 2 ug/l, below the instrument detection limits (IDL). Benzene had previously been reported in OW-9 at a concentration of 3.9 ug/l. Chloroethane was detected in three samples (OW-4, OW-5R, and OW-9) at concentrations below the IDL.

The wells with reported concentrations that are not associated with laboratory blanks are all downgradient from the landfill. Methylene chloride was found in all samples and blanks. Acetone was reported in three samples and a laboratory method blank, which had the highest concentration. Chloroform was reported in four samples, a trip blank, and a laboratory method blank. Bromoform, toluene, and 4-methyl-2-pentanone were reported only in the laboratory method blank. Tentatively identified compounds (TIC) were noted in the samples from wells OW-5R, OW-6A, and OW-15 at estimated concentrations less than or equal to 11 ug/l. All three wells are downgradient at the disposal areas. The previously reported

occurrence of 2-butanone and xylenes was not confirmed by this round of sampling.

The results from the acid/base/neutral (A/B/N) organics analyses on the monitoring well samples are presented in Table 2. The monitoring wells installed in October 1988 showed no detectable concentrations of A/B/N organics. The observation wells installed prior to the RI appear to be glued Schedule 20 PVC casing, except observation well OW-5R, which was built at a later date and is constructed of threaded Schedule 40 PVC. Butylbenzylphthalate was reported above the IDL from two pre-RI wells (OW-4 and OW-9) and diethylphthalate was reported below the IDL in one pre-RI well (OW-5R). These are phthalate esters which occur in a wide variety of materials as plasticizers. The USEPA has recognized the potential for laboratory contamination of samples by phthalate esters and it allows the phthalate concentration in laboratory method blanks at a level five times greater than any other A/B/N organic (USEPA, 1988). No other A/B/N organics were detected above quantitation limits in the monitoring wells. Several tentatively identified compounds were reported by the laboratory in their report, most as unknown compounds and all below the IDL.

The results from the pesticides/PCBs analysis of the monitoring well samples indicate that no samples had detectable concentrations of these constituents. These results are presented in Table 3.

The results from the Target Analyte List (TAL) inorganic constituent and cyanide analyses of the monitoring well samples are presented in Table 4. The results show that two wells had detectable levels of cyanide and of those two, the background well (OW-14) had the highest concentration (38.70 ug/l).

Review of the laboratory QC data indicates that there were consistent problems in analyzing antimony and chromium (laboratory duplicates were not within control limits for 97 percent of samples with quantifiable concentrations). Analyses for sodium were qualified as estimated ("E") because the concentrations for diluted and undiluted aliquots differed by more than 10 percent. The bold-printed values in Table 4 represent the metal concentrations greater than background (OW-14) for both filtered and unfiltered samples. USEPA Maximum Contaminant Levels (40 CFR Part 141) were exceeded one time each for cadmium (12.1 ug/l at OW-4A) and mercury (1.2 ug/l at OW-11) in filtered ground water samples. Six of the seven MCL inorganics with reliable analyses (i.e., excluding chromium) were also observed above background values as defined by the concentrations reported for OW-14. The seventh constituent (selenium) was not detected. Of the remaining inorganic constituents of the TAL, only thallium was not reported above the background value from OW-14 at least once. The presence of any constituent above a single background value does not necessarily signify that these constituents have been released from the disposal areas.

Recommendations

Based on the discussion and interpretation of the first round results presented above, recommendations for the second round of ground water sampling from monitoring and residential wells at the Algoma Landfill are as follows:

1. Analyze the volatile organic compounds of the Target Compound List and the inorganic constituents (filtered samples only) of the Target Analyte List. This is in accordance with the agreement reached between the USEPA, WDNR, and the Respondents

during the meeting on July 21, 1988, whereby concentrations relative to the background value were to be used to define the second round sampling program.

2. Delete the following analyses for the second sampling round:

   a. Pesticides/PCBs - No detectable level of these were found in any of the samples.

   b. Cyanide - This parameter was only detected in two wells. The downgradient concentration (28.30 ug/l at OW-15) was lower than the upgradient/background concentration (38.70 ug/l at OW-14).

   c. A/B/N Organics - None of these compounds were detected, except for phthalate ester at wells OW-4, OW-5R, and OW-9 and TICs.

3. Delete the pore gas survey, based on the VOCs results from the first round monitoring well samples. No VOCs were detected at concentrations above the IDLs, except for the isolated occurrence of TCA at OW-10.

4. Discharge the purge water collected during the second sampling round onto the ground near the purged well.

5. Discharge the purge water (approximately 200 gallons) previously collected during the first sampling round, and presently stored in four 55-gallon drums on-site, onto the ground near the storage area.

References

USEPA, 1988. Contract Laboratory Program Statement of Work for Organic Analysis, February 1988.

TABLE 1
SUMMARY OF VOC ANALYSES

Ground Water Matrix (Monitoring Well)

Sampling Location	Parameter Detected	Concentration (ug/l)	Instrument Detection Limit (ug/l)
ALOW-04-01	Chloroethane	3J	5
	Methylene chloride	3BJ	5
ALOW-5R-01	Chloroethane	3J	5
	Methylene chloride	4BJ	5
	Benzene	2J	5
	TIC:Ethane,1,1'-oxybis	11J	
	TIC:unknown	8J	
ALOW-6A-01	Methylene chloride	5B	5
	Acetone	16B	10
	Chloroform	7B	5
	TIC:Unknown	6J	
ALOW-9-01	Methylene chloride	3BJ	5
	Benzene	1J	5
ALOW-DO1	Chloroethane	2J	5
(ALOW-9-01)	Methylene chloride	2BJ	5
	Benzene	1J	5
ALOW-10-01	Methylene chloride	5B	5
	1,1,1-Trichloroethane	18	5
	1,1-Dichlorethane	2J	5
ALOW-11-01	Methylene chloride	3BJY	5
	1,1,1-Trichloroethane	2J	5
	Chloroform	4BJ	5
ALOW-12-01	Methylene chloride	3BJ	5
	Chloroform	4BJ	5
ALOW-13-01	Methylene chloride	6B	5
	Acetone	3J	10
ALOW-14-01	Methylene chloride	3BJ	5
ALOW-15-01	Methylene chloride	4BJ	5
	Acetone	14B	10
	Chloroform	6B	5
	TIC:1 Propanol	8J	

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TABLE 1
SUMMARY OF VOC ANALYSES
(Continued)

Ground Water Matrix (Private Residence)

Sampling Location	Parameter Detected	Concentration (ug/l)	Instrument Detection Limit (ug/l)
ALPW-01-01	None		
ALPW-02-01	Methylene chloride	1B	1
ALPW-03-01	None		
ALPW-04-01	None		
ALPW-D01 (ALPW-04-01)	Methylene chloride	1B	1
ALPW-05-01	Methylene chloride	1B	1

NOTES:

1. ALOW-D01 is the duplicate of ALOW-9-01.
2. ALPW-D01 is the duplicate of ALPW-04-01.
3. Abbreviations:

   J = Indicates an estimated value.

   B = Analyte found in the associated blank as well as in the sample.

   Y = Computer system has been over-ridden by a manual integration of peak area and a manual calculation of compound concentration.

TABLE 2
SUMMARY OF A/B/N ORGANIC ANALYSES

Ground Water Matrix (Monitoring Well)

Sampling Location	Parameter Detected	Concentration (ug/l)	Instrument Detection Limit (ug/l)
ALOW-4-01	**Butylbenzylphthalate**	21	10
	TIC:Unknown	8J	
	TIC:Unknown	10J	
ALOW-5R-01	Diethylphthalate	3J	10
	TIC:Unknown	12J	
	TIC:Unknown	8J	
	TIC:Unknown	8J	
	TIC:Unknown	8J	
ALOW-6A-01	TIC:Unknown	18J	
ALOW-9-01	**Butylbenzylphthalate**	22	10
	TIC:dibutoxymethanol	8J	
	TIC:Unknown acid	10J	
ALOW-D01	**Butylbenzylphthalate**	21	10
	TIC:Unknown	8J	
	TIC:Dibutoxymethanol	8J	
	TIC:Dodecanoic acid	12J	
ALOW-10-01	None		
ALOW-11-01	None		
ALOW-12-01	None		
ALOW-13-01	None		
ALOW-14-01	None		
ALOW-15-01	None		

NOTES:

1. ALOW-D01 is the duplicate of ALOW-9-01.

2. ALPW-D01 is the duplicate of ALPW-04-01.

3. Abbreviations:
   J = Indicates an estimated value.
   B = Analyte found in the associated blank as well as in the sample.
   Y = Computer system has been over-ridden by a manual integration of peak area and a manual calculation of compound concentration.

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TABLE 3
SUMMARY OF PESTICIDES/PCBs ANALYSES

Ground Water Matrix (Monitoring Well)

Sampling Location	Parameter Detected
ALOW-4-01	None
ALOW-5R-01	None
ALOW-6A-01	None
ALOW-9-01	None
ALOW-D01	None
ALOW-10-01	None
ALOW-11-01	None
ALOW-12-01	None
ALOW-13-01	None
ALOW-14-01	None
ALOW-15-01	None

NOTES:

1. ALOW-D01 is the duplicate of ALOW-9-01.
2. ALPW-D01 is the duplicate of ALPW-04-01.
3. Abbreviations:

   J - Indicates an estimated value.

   B - Analyte found in the associated blank as well as in the sample.

   Y - Computer system has been over-ridden by a manual integration of peak area and a manual calculation of compound concentration.

TABLE 4
SUMMARY OF INORGANIC ANALYSES

	Concentrations (ug/l)					
	ALOW-6A-01		ALOW-D01		ALOW-14-01	
Parameter	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Aluminum	72.70B	891.00	72.70B	392.00	121.00B	2,470.00
Antimony		83.30*	119.00*	55.00B	62.10*	254.00*
Arsenic			3.20B	3.60B		
Barium		40.70B	72.80B	68.10B		209.00
Beryllium		1.60B	1.00B			2.30B
Cadmium		12.10	7.40	8.10		15.10
alcium	76,100.00	152,000.00	90,500.00	121,000.00	69,500.00	400,000.00
hromium	16.50*		24.80*	16.50		14.50*
Cobalt			31.30B			
Copper	11.10B	41.60	31.10	19.30B	24.10B	45.80
Iron	26.80B	2,900.00	9,180.00	10,700.00	164.00	3,220.00
Lead		6.40	2.70B	3.40B		2.70B
Magnesium	33,900.00	74,500.00	52,800.00	68,000.00	36,100.00	150,000.00
Manganese	7.30B	417.00	198.00	240.00	18.20	808.00
Mercury		0.60				
Nickel						31.60B
Potassium	21,700.00B	2,150.00B	10,600.00	10,800.00	1,160.00B	1,780.00B
lenium						
ilver	7.00B	12.10		13.30	8.00B	17.10
Sodium	3,750.00BE	3,770.00BE	23,600.00E	27,200.00E	2,320.00BE	2,470.00BE
Thallium						
Vanadium	15.70B		25.70B			21.90B
Zinc	23.90	57.10	32.40	90.50	16.60B	55.20
Cyanide	NA		NA		NA	38.70

NOTES:
* - Duplicate samples not within control limits.
B - Reported value is less than contract required detection limit but greater than instrument detection limit.
E - The reported value is estimated because of the presence of interferences.
S - The reported value was determined by method of standard additions.
W - Post-digestion spike for furnace AA analysis is out of control limits.
NA - No analysis performed.
- Where no value is reported, the constituent was not detected above the IDL.

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TABLE 4
SUMMARY OF INORGANIC ANALYSES
(Continued)

	Concentrations (ug/l)					
	ALOW-4A-01		ALOW-5R-01		ALOW-13-01	
Parameter	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Aluminum	84.80B	1,330.00	133.00B	1,720.00	88.90B	1,240.00
Antimony	70.90*	192.00	206.00*	291.00		121.00
Arsenic				7.60B		
Barium		54.60B	122.00B	179.00B	166.00B	206.00
Beryllium	1.30B	1.80B	1.50B	1.80B		1.20B
Cadmium	12.10	12.10	9.70	16.70	4.50B	8.70
alcium	120,000.00	244,000.00	114,000.00	284,000.00	94,400.00	164,000.00
Chromium	17.30*	17.30*			13.70*	14.50*
Cobalt						
Copper	14.40B	32.80	22.30B	33.40	19.20B	45.80
Iron	136.00	2740.00	12,200.00	26,000.00	60.50B	4,210.00
Lead		3.20B		18.20S		3.40B
Magnesium	68,000.00	127,000.00	92,000.00	159,000.00	38,200.00	69,800.00
Manganese	393.00	592.00	131.00	675.00	184.00	347.00
Mercury						
Nickel		31.60B				30.00B
Potassium	1,240.00B	1,500.00B	25,300.00	27,200.00	2,740.00B	3,230.00B
lenium						
Silver	17.10	10.00	12.10	14.30	8.00B	11.00
Sodium	18,100.00E	18,500.00	66,200.00E	69,800.00	8,830.00	7,530.00
Thallium						
Vanadium		17.10B		51.00		24.70B
Zinc		34.60	26.60	46.30		56.10
Cyanide	NA		NA		NA	

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TABLE 4
SUMMARY OF INORGANIC ANALYSES
(Continued)

	Concentrations (ug/l)				
	ALOW-9-01		ALOW-10-1		ALOW-F01
Parameter	Filtered	Unfiltered	Filtered	Unfiltered	Filtered
Aluminum	64.80B	222.00	126.00B	2,020.00	
Antimony	90.40*	99.30*		277.00*	
Arsenic	4.20B	3.40B			4.80B
Barium	74.70B	67.00B	47.60B	174.00B	
Beryllium	1.10B	1.00B	1.70B	2.50B	
Cadmium	5.60	12.10	5.60	12.60	
Calcium	95,000.00	101,000.00	141,000.00	466,000.00	93.40B
Chromium			20.50*		16.10
Cobalt				38.80B	
Copper	16.70B	17.90B	19.80B	56.50	8.00
Iron	9,470.00	9,660.00	297.00	4,960.00	
Lead		3.00		2.95BW	2.00B
Magnesium	52,500.00	58,000.00	45,700.00	156,000.00	
Manganese	200.00	218.00	344.00	1360.00	
Mercury					0.70
Nickel		26.90B			
Potassium	11,200.00	9,820.00	2,640.00B	2,760.00B	
Selenium					
Silver		7.00B	11.30	16.30	
Sodium	27,000.00E	22,300.00E	8,490.00E	8,430.00E	289.00BE
Thallium					
Vanadium			17.10B	16.20B	
Zinc	35.20	49.30	24.10	148.00	19.40B
Cyanide	NA		NA		NA

NOTES:
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- S - The reported value was determined by method of standard additions.
- W - Post-digestion spike for furnace AA analysis is out of control limits.
- NA - No analysis performed.
- - Where no value is reported, the constituent was not detected above the IDL.

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TABLE 4
SUMMARY OF INORGANIC ANALYSES
(Continued)

	Concentrations (ug/l)					
	ALOW-15-01		ALOW-12-01		ALOW-11-01	
Parameter	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Aluminum	332.00	11,100.00		60.60B		73.70B
Antimony	92.20*	234.00*		142.00*		76.20*
Arsenic		3.80B				
Barium		274.00	41.20B	42.20B		
Beryllium	1.20B	2.30B	1.90B		1.90B	
Cadmium	6.20	15.60		6.80	7.60	4.50B
Calcium	83,900.00	333,000.00	34,700.00	35,500.00	65,900.00	68,500.00
Chromium	31.90*	20.80*			15.80*	12.60*
Cobalt						
Copper	13.10B	109.00	17.40B	15.00B	20.00B	14.40B
Iron	771.00	18,700.00	249.00	371.00	25.70B	246.00
Lead	2.50B	9.30	3.00B	6.20		2.80B
Magnesium	42,300.00	152,000.00	30,300.00	30,500.00	33,300.00	36,200.00
Manganese	104.00	1,760.00	23.40	32.80	6.00B	11.10B
Mercury		1.20			1.20	
Nickel		40.90				
Potassium	1,820.00B	4,730.00B	1,690.00B	1,670.00B	898.00B	1,080.00B
Selenium						
Silver	6.00B	20.10		8.00B		6.00B
Sodium	5,710.00E	6,060.00E	9,520.00E	10,500.00E	3,500.00BE	4,090.00BE
Thallium						
Vanadium		41.90B				
Zinc	22.70	171.00	47.80	227.00	21.10	51.50
Cyanide	NA	28.30	NA		NA	

NOTES: * - Duplicate samples not within control limits.
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E - The reported value is estimated because of the presence of interferences.
S - The reported value was determined by method of standard additions.
W - Post-digestion spike for furnace AA analysis is out of control limits.
NA - No analysis performed.
- Where no value is reported, the constituent was not detected above the IDL.

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TECHNICAL MEMORANDUM
LANDFILL COVER EVALUATION AND TESTING
SUMMARY OF FINDINGS

ALGOMA LANDFILL REMEDIAL INVESTIGATION
ALGOMA, WISCONSIN

FEBRUARY 1989

USEPA DOCKET NO. V-W-87-C-036

PREPARED BY
RMT, INC.

Objectives:

The landfill cover evaluation and testing were performed to evaluate the physical characteristics of the cover material of the Landfill Disposal Area (LDA), North Disposal Area (NDA), and South Disposal Area (SDA). No samples were collected from the NDA and SDA. The NDA and SDA were found to have no cover material; therefore, fill/refuse is exposed at the ground surface.

Sections 4 and 7.8 of the Workplan provide additional descriptions of the site, the RI objectives, and the role that the landfill cover evaluation and testing play in the investigation.

Plan Implementation:

The landfill cover samples were collected on October 12, 1988 (Figure 1). A description of the fieldwork was summarized in the Fieldwork Summary Technical Memorandum submitted to the USEPA and WDNR on October 28, 1988. The samples were held by RMT from October 1988 until approval by USEPA of the testing program in December 1988. Results from the testing program were received on January 24, 1989, and are presented in this technical memorandum.

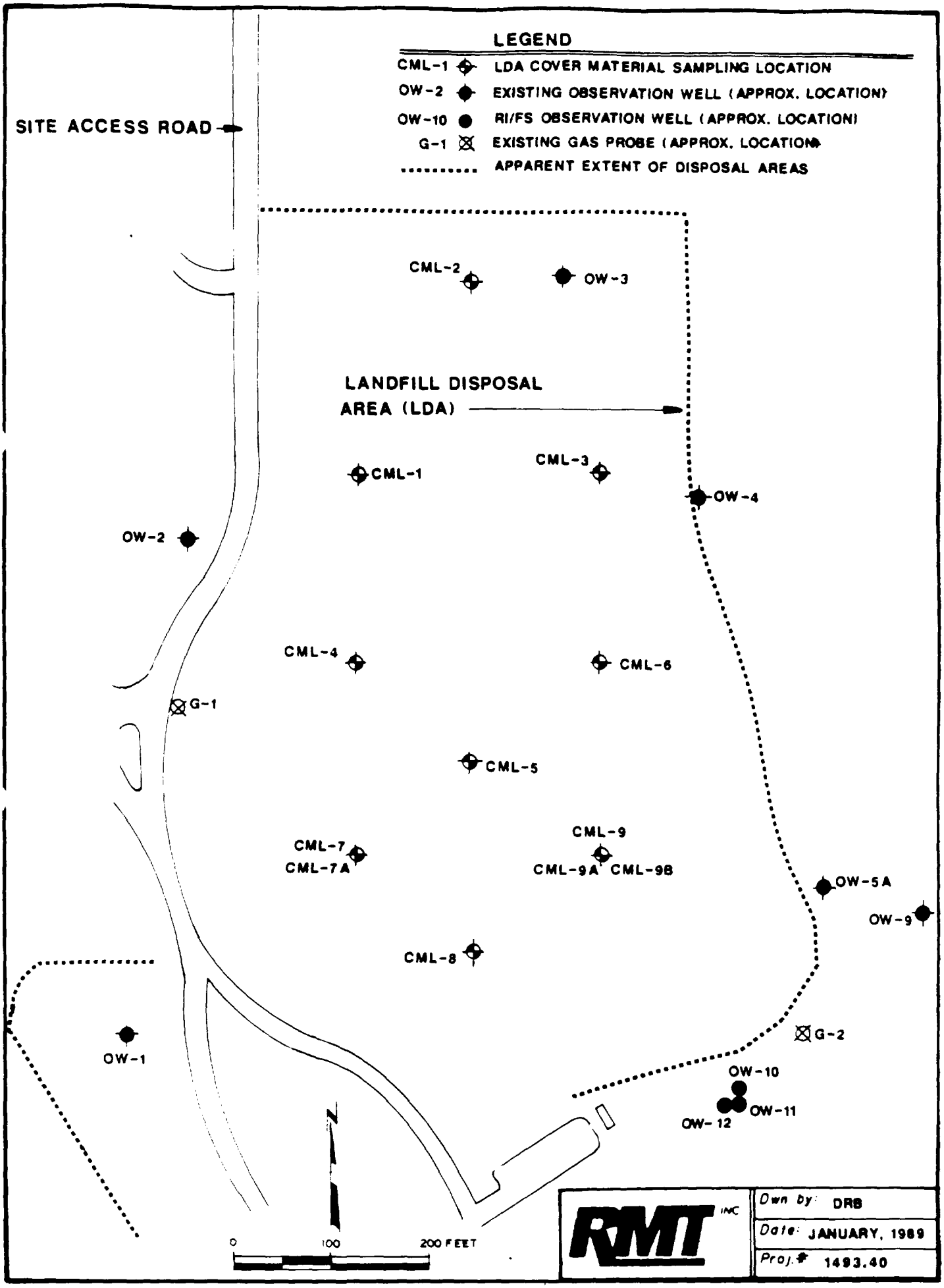
LEGEND
CML-1 LDA COVER MATERIAL SAMPLING LOCATION
OW-2 EXISTING OBSERVATION WELL (APPROX. LOCATION)
OW-10 RI/FS OBSERVATION WELL (APPROX. LOCATION)
G-1 EXISTING GAS PROBE (APPROX. LOCATION)
APPARENT EXTENT OF DISPOSAL AREAS
SITE ACCESS ROAD
LANDFILL DISPOSAL AREA (LDA)
CML-2
OW-3
CML-1
CML-3
OW-4
OW-2
CML-4
CML-6
G-1
CML-5
CML-7
CML-7A
CML-9
CML-9A
CML-9B
OW-5A
OW-9
CML-8
OW-1
G-2
OW-10
OW-11
OW-12
0
100
200 FEET
RMT INC
Dwn by: DRB
Date: JANUARY, 1989
Proj.# 1493.40

FIGURE 1

The Shelby tubes collected on the LDA (Table 1) were opened on January 4, 1989, at the RMT Soil Laboratory. At that time it became evident that, due to the large amount of gravel in the cover material as well as its dryness, most of the samples were disturbed and, therefore, unusable for the falling head permeability test. Out of the ten (10) Shelby tubes opened (ALCL-7 and ALCL-9A were not opened because of poor recovery - see Table 1), only four tubes had a section of undisturbed soil long enough to be analyzed for the permeability test. All of the other samples either showed signs of stress fracturing from pushing the Shelby tube or had deep grooves cut into them from gravel caught in front of the tube during sampling. Photographs were taken of the samples after they had been extruded from the tubes. These photographs are kept in RMT's technical files.

The four undisturbed sample sections were tested for permeability, grain size, and Atterberg limits. Samples from all other tubes were tested for only grain size and Atterberg limits (Table 2). One sample (ALCL-4) recovered three layers of material, an organic layer (topsoil), a reddish-brown clayey material (cover material), and a fine sand (final grade material). A sample of each of these layers was analyzed.

Landfill Cover Testing Results

The uppermost layer of the LDA cover material can be characterized as being formed of 0.5 to 1.0 feet of an uncompacted light to dark brown organic sandy silty clay (topsoil) with little gravel (see results for samples ALCL-2 and ALCL-4). Beneath the topsoil is 1.0 to 1.5 feet

TABLE 1

SUMMARY OF LANDFILL DISPOSAL AREA COVER SAMPLING

Sample #		Grid Location*		Sampling Interval (feet)	Sample Recovered (feet)
Reference	Field	North	East		
ALCL-1	CML-1	86+00	32+89	0.5 - 2.5	1.2
ALCL-2	CML-2	88+00	34+10	0.5 - 2.5	0.7
ALCL-3	CML-3	86+00	35+34	0.5 - 2.5	1.2
ALCL-4	CML-4	84+00	32+89	0.5 - 2.0	1.5
ALCL-5	CML-5	83+00	34+10	0.5 - 2.5	1.2
ALCL-6	CML-6	84+00	35+34	0.5 - 2.5	1.8
ALCL-7	CML-7	82+00	32+89	0.5 - 1.0	0.5
ALCL-7A	CML-7A	82+00	32+89	0.5 - 1.5	1.0
ALCL-8	CML-8	81+00	34+10	0.5 - 2.0	1.2
ALCL-9	CML-9	82+00	35+34	0.5 - 1.4	0.8
ALCL-9A	CML-9A	82+00	35+34	0.5 - 1.0	0.5
ALCL-9B	CML-9B	82+00	35+34	0.5 - 1.8	1.2

*Refer to Attachment C of the Technical Memorandum for the geophysical investigation submitted on October 21, 1988, for a site map showing the survey grid over the landfill.

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TABLE 2

ALGOMA LANDFILL COVER TESTING PROGRAM SUMMARY

Sample ID	Boring	Depth (feet)	Grain Size				Atterberg Limits			USCS Class	Falling Head Permeability cm/sec
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Limit (%)	Limit (%)	Index (%)		
ALCL-01	CML-1	0.5 - 2.5	7.3	31.0	32.9	28.8	27.1	15.0	12.1	CL	
ALCL-02	CML-2	0.5 - 2.5	9.4	37.4	31.4	21.7	23.6	15.1	8.5	CL	1.7×10^{-4}
ALCL-03	CML-3	0.5 - 2.5	24.1	30.1	26.0	19.8	26.2	16.5	9.7	SC	
ALCL-04	CML-4	0.5 - 1.0	7.4	42.4	32.3	17.9	27.0	20.1	6.9	CL-ML	
ALCL-05	CML-5	0.5 - 2.5	8.5	38.8	26.1	26.6	38.4	15.5	12.9	CL	
ALCL-06	CML-6	0.5 - 2.5	7.1	39.3	28.3	25.4	26.6	14.6	12.0	CL	3.0×10^{-6}
ALCL-07(a)	CML-7A	0.5 - 1.5	15.6	36.2	24.9	23.3	32.6	20.0	12.6	SC	5.6×10^{-5}
ALCL-08	CML-8	0.5 - 2.0	19.1	32.5	24.3	24.1	27.8	15.7	12.1	SC	7.9×10^{-8}
ALCL-09(b)	CML-9B	0.5 - 1.8	13.5	33.8	28.3	24.4	29.0	16.9	12.1	CL	
ALCL-10	CML-4	1.0 - 1.8	27.5	29.0	22.1	21.4	29.1	16.2	12.9	SC	
ALCL-11	CML-4	1.8 - 2.0	5.2	58.7	24.8	11.3	(d)	(d)	(d)	SP-SM	
Avg(c)			14.0	35.0	27.7	23.3	28.7	16.6	11.2	CL	6.9×10^{-6}

(a) Referred to in Field Work Summary Technical Memorandum as ALCL-7A.
(b) Referred to in Field Work Summary Technical Memorandum as ALCL-9B.
(c) Average of grain size does not include ALCL-11 since this is the material used for final grade beneath the cover. The average for permeability is a geometric mean.
(d) Sample not analyzed for Atterberg limits (identified in the field as a sand).

of compacted reddish-brown silty clay to clayey sand with a trace to some gravel. The cover material appears to lie on top of an uncompacted/loose light brown silty sand (sample ALCL-11) which appears to be the final grade material. A sample of the final grade material was only obtained in one boring (CML-4) although the Shelby tubes were usually pushed into this material. Because of its looseness and lack of cohesion, this material was usually not retained in the Shelby tube. This poorly graded silty sand is classified as SP-SM.

The compacted cover material was sampled at all locations, and eight of the samples were analyzed for grain size and Atterberg limits. This material contains large (2 to 3 inch-diameter) gravel and is classified as a clay (CL) to a clayey sand (SC).

The topsoil overlying the compacted cover was analyzed in two samples (ALCL-02 and ALCL-04). This material is classified as a clay (CL) to a silty clay (CL-ML). The material is very similar to the compacted material in nature except for the organic content and the color.

The four falling head permeability tests were performed on the least damaged (best) sections of the material collected using the Shelby tubes. Of these four tests, three were performed on the compacted cover material, and one test was run on a sample (ALCL-07) consisting of half cover and half topsoil. The permeability test results ranged from 1.7×10^{-4} cm/sec to 7.9×10^{-8} cm/sec with a geometric mean of 6.9×10^{-6} cm/sec. However, the higher permeability (10^{-4}) was measured on a CL-classified sample and the lower permeability (10^{-8}) on a SC-classified sample. This discrepancy can be associated with the poor condition of

the samples due to the large amount (an average of 14%) of coarse gravel in the material and the dryness of the cover at the time of sampling.

Conclusions and Recommendations

The landfill cover evaluation and testing program identified the NDA and SDA as lacking a cover over the waste. The LDA has a 1.0- to 1.5-foot-thick compacted clay cover and a 0.5- to 1.0-foot-thick layer of topsoil. Both materials contain coarse gravel and have an average 51% smaller grain size than the P200. The cover material ranges from a lean clay with sand (CL) to a clayey sand (SC). The cover material was tested four times for falling head permeability with a geometric mean value of 6.9×10^{-6} cm/sec, and a range between 1.7×10^{-4} and 7.9×10^{-8} cm/sec.

The objectives of this program were met; therefore, no further cover material sampling is recommended.

ATTACHMENT

RMT, INC.
F-286 (R1/84:SL-1)

SUMMARY OF SOILS LAB ANALYSES

QC CHECKED BY : ____ DATE : ____ SHEET 1 OF 2

QA CHECKED BY : APH DATE : 1-23-89

PROJECT: ALGOMA LF RI/FS
PROJECT #: 1993.23

W.O. #: 881221-149323
DATE: 1-16-89

REQUESTER: TH. VAN BIERSEL
TECHNICIAN: AMZ

PARAMETER \ SAMPLE #	ALCL-01	ALCL-02	ALCL-03	ALCL-04	ALCL-05	ALCL-06
Natural Moisture (%)						
Specific Gravity						
Grain Size (%)[1]	A 17.3 / 31.0 32.9 / 28.8	A 9.4 / 37.4 31.1 / 21.7	A 24.1 / 30.1 26.0 / 19.8	A 7.4 / 42.4 32.3 / 17.9	A 8.5 / 38.8 26.1 / 26.6	A 7.1 / 39.3 28.3 / 25.4
Atterberg Limits[2]	LL = 27.1 PI = 12.1 (CL)	LL = 23.6 PI = 8.5 (CL)	LL = 26.2 PI = 9.7 (SC)	LL = 27.0 PI = 6.9 (CL-ML)	LL = 28.9 PI = 12.9 (CL)	LL = 26.6 PI = 12.0 (CL)
Moisture/ Density (Std)[3]	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %
Moisture/ Density (Mod)[3]	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %
Density[4]	γ_D = Pcf @ @ % M	γ_D = 110.1 Pcf @ — @ 9.3 % M	γ_D = Pcf @ @ % M	γ_D = Pcf @ @ % M	γ_D = Pcf @ @ % M	γ_D = 118.9 Pcf @ — @ 8.4 % M
Permeability (cm/sec)[5]	___ | X 10^{-}	N | 1.7×10^{-4}	___ | X 10^{-}	___ | X 10^{-}	___ | X 10^{-}	N | 3.0×10^{-6}
Organic Content (%)						
Shrinkage Limit						
Unconfined Strength						

[1] GRAIN SIZE
- A - Gravel/Sand/Silt/Clay (Sieve and Hydrometer)
- B - Gravel/Sand/Silt-Clay (Sieve only)(Sieve and P200)
- C - Gravel-Sand/Silt/Clay (Hydrometer Only)(Hydrometer and P200)
- D - Gravel-Sand/Silt-Clay (P200 Only)

[2] ATTERBERG LIMITS
- LL = Liquid Limit
- PI = Plasticity Index

[3] MOISTURE/ DENSITY
- γ_{max} = Maximum Density
- Opt. M. = Optimum Moisture

[4] DENSITY
- γ_D = Dry Density (lb/ft^3)
- @ % Compaction
- @ % Moisture (M)

[5] PERMEABILITY
- N = Non-recompacted
- R = Recompacted

COMMENTS: ____

RMT, INC.
F-286 (R1/84:SL-1)

SUMMARY OF SOILS LAB ANALYSES

QC CHECKED BY : _____ DATE : _____ SHEET 2 OF 2

QA CHECKED BY : JOH DATE : 1-25-89

PROJECT: ALGOMA LF RI/FS
PROJECT #: 1493.23

W.O. #: 881221-149323
DATE: 1-16-89

REQUESTER: TH. VAN BIERSEL
TECHNICIAN: AMZ

PARAMETER \ SAMPLE #	ALCL-07	ALCL-08	ALCL-09	ALCL-10	ALCL-11	
Natural Moisture (%)						
Specific Gravity						
Grain Size (%)[1]	A | 15.6 / 36.2 24.9 / 23.3 ✓	A | 19.1 / 32.5 24.3 / 24.1 ✓	A | 13.5 / 33.8 28.3 / 24.4 ✓	A | 27.5 / 29.0 22.1 / 21.4 ✓	A | 5.2 / 58.7 24.8 / 11.3 ✓	_ | _ / _ _ _ /
Atterberg Limits[2]	LL = 32.6 (SC) PI = 12.6 ✓	LL = 27.8 (SC) PI = 12.1 ✓	LL = 29.0 (CL) PI = 12.1 ✓	LL = 29.1 (SC) PI = 12.9 ✓	LL = PI =	LL = PI =
Moisture/ Density (Std)[3]	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %
Moisture/ Density (Mod)[3]	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %	γ_{max} = Pcf Opt. M. = %
Density[4]	γ_D = 111.3 Pcf @ — @ 11.1 % M ✓	γ_D = 123.3 Pcf @ — @ 9.8 % M	γ_D = Pcf @ @ % M	γ_D = Pcf @ @ % M	γ_D = Pcf @ @ % M	γ_D = Pcf @ @ % M
Permeability (cm/sec)[5]	N | 5.6 X 10^{-5}	N | 7.9 X 10^{-8}	_ | X 10^{-}	_ | X 10^{-}	_ | X 10^{-}	_ | X 10^{-}
Organic Content (%)						
Shrinkage Limit						
Unconfined Strength						

[1] GRAIN SIZE
- A - Gravel/Sand/Silt/Clay (Sieve and Hydrometer)
- B - Gravel/Sand/Silt-Clay (Sieve only)(Sieve and P200)
- C - Gravel-Sand/Silt/Clay (Hydrometer Only)(Hydrometer and P200)
- D - Gravel-Sand/Silt-Clay (P200 Only)

[2] ATTERBERG LIMITS
- LL = Liquid Limit
- PI = Plasticity Index

[3] MOISTURE/ DENSITY
- γ_{max} = Maximum Density
- Opt. M. = Optimum Moisture

[4] DENSITY
- γ_D = Dry Density (lb/ft^3)
- @ % Compaction
- @ % Moisture (M)

[5] PERMEABILITY
- N = Non-recompacted
- R = Recompacted

COMMENTS:

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: JAH Date: 1-23-89

ATTERBERG LIMITS

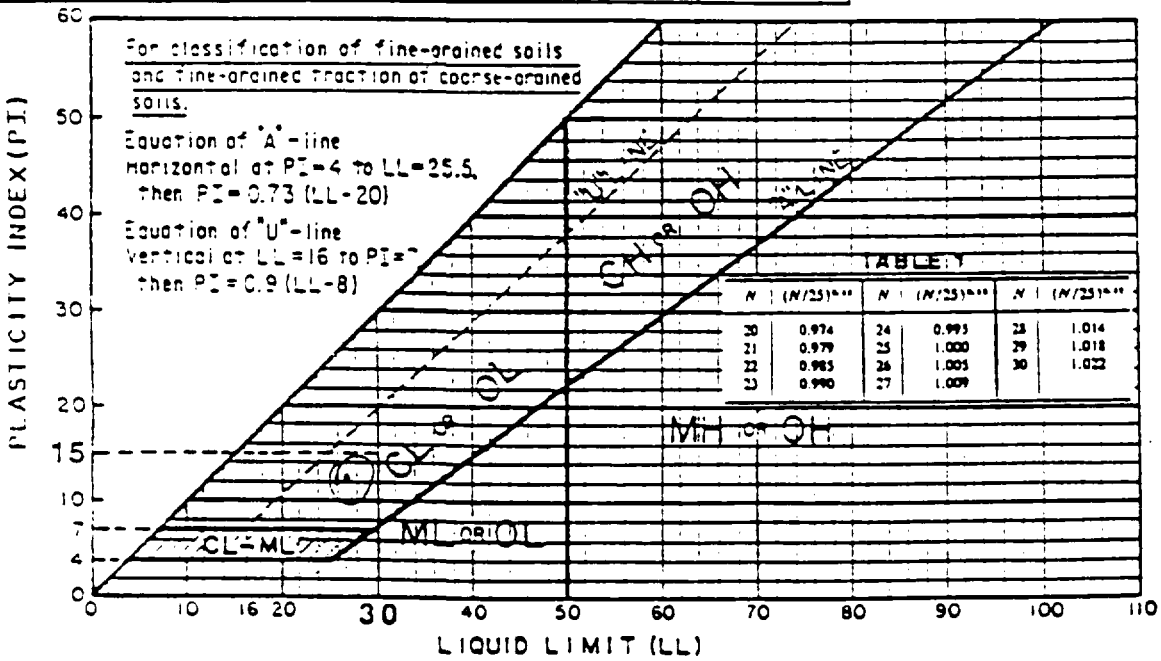
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1993.23 DATE 1-10-89

SAMPLE NO. ALCL-01 DEPTH 0.5-2.5' TESTED BY GMP

VISUAL DESCRIPTION REDDISH-BROWN, SILTY/CLAY SOME GRAVEL

PAN NO. 808

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G1	G2		G12		
NUMBER OF BLOWS	23	23		—	—	
CAN WEIGHT + WET SOIL (grms)	151.68	154.61		140.41		
CAN WEIGHT + DRY SOIL (grms)	144.05	146.36		137.22		
WEIGHT OF WATER (grms)	7.63 ✓	8.25 ✓		3.19 ✓		
WEIGHT OF CAN (grms)	116.25	116.05		115.95		
WEIGHT OF DRY SOIL (grms)	27.8 ✓	30.31 ✓		21.27 ✓		AVE. =
WATER CONTENT (PERCENT)	27.4 ✓	27.2 ✓	AVE. =	15.0 ✓		
CORRECTED VALUES	27.2 ✓	26.9 ✓	27.1 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	27.1 ✓	PLASTICITY INDEX	12.1 ✓
PLASTIC LIMIT (PERCENT)	15.0 ✓	CLASSIFICATION (SYMBOL)	CL ✓

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: [illegible] Date: 1-23-89

ATTERBERG LIMITS

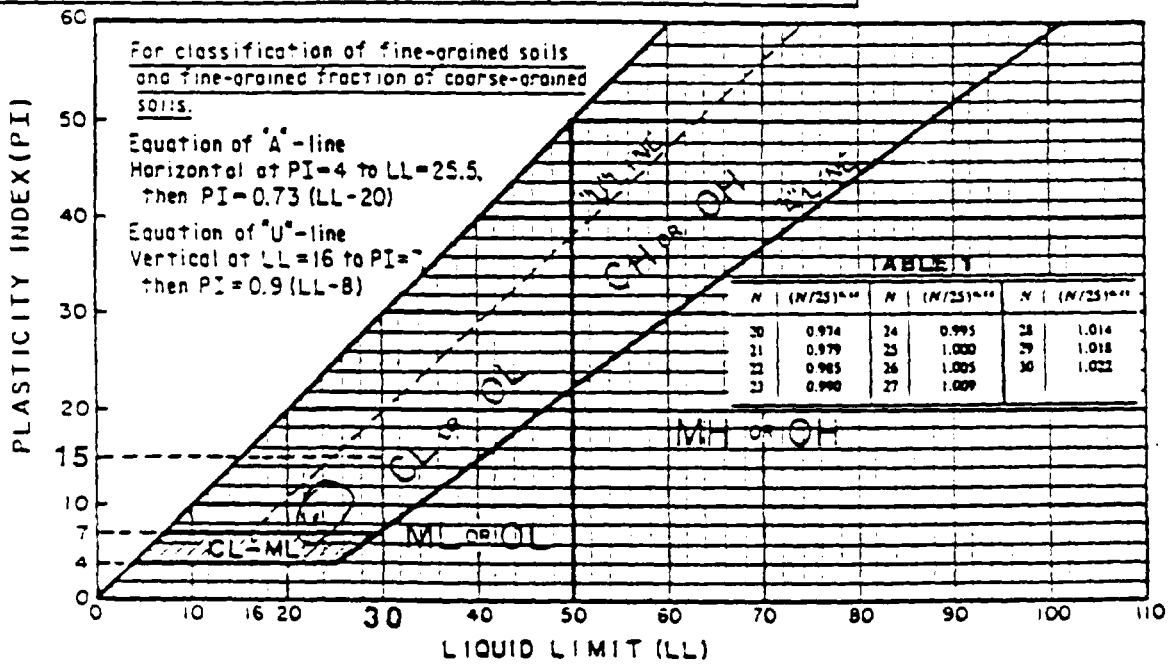
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.23 DATE ~~12-20-88~~ 1-10-88

SAMPLE NO. ALCL-02 DEPTH .5 - 2.5 TESTED BY ~~GMD~~

VISUAL DESCRIPTION LIGHT BROWN, SANDY, SILTY, CLAY, LITTLE GRAVEL

PAN NO. B1B

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G3	G4		G9		
NUMBER OF BLOWS	25	25		—	—	
AN WEIGHT + WET SOIL (grms)	150.19	155.55		139.56		
CAN WEIGHT + DRY SOIL (grms)	143.26	148.01		136.29		
WEIGHT OF WATER (grms)	6.93 ✓	7.54 ✓		3.27 ✓		
WEIGHT OF CAN (grms)	113.84	115.93		114.66		
WEIGHT OF DRY SOIL (grms)	29.42 ✓	32.08 ✓		21.63 ✓		AVE. =
WATER CONTENT (PERCENT)	23.6 ✓	23.5 ✓	AVE. =	15.1 ✓		
CORRECTED VALUES	23.6 ✓	23.5 ✓	23.6 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	23.6 ✓	PLASTICITY INDEX	8.5 ✓
PLASTIC LIMIT (PERCENT)	15.1 ✓	CLASSIFICATION (SYMBOL)	CL

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: [illegible] Date: 1-23-89

ATTERBERG LIMITS

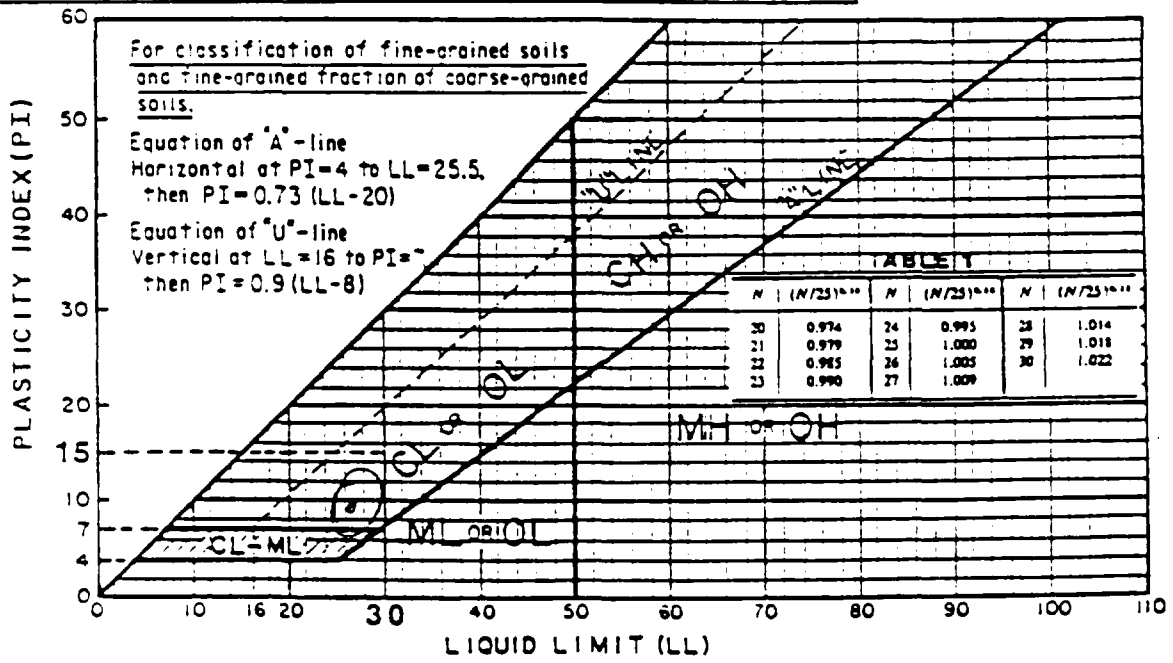
PROJECT NAME ALGOMA LF R I/FS PROJECT NO. 1493.23 DATE ~~12-20-88~~ 1-10-89

SAMPLE NO. ALCL-03 DEPTH .5-2.5 TESTED BY ~~SAP~~

VISUAL DESCRIPTION REDDISH-BROWN, SILTY CLAY, SOME GRAVEL

PAN NO. 82B

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G5	G6		G10		
NUMBER OF BLOWS	26	26		—	—	
CAN WEIGHT + WET SOIL (grms)	153.18	162.87		139.86		
CAN WEIGHT + DRY SOIL (grms)	145.00	145.26		136.15		
WEIGHT OF WATER (grms)	8.18 ✓	7.61 ✓		3.71 ✓		
WEIGHT OF CAN (grms)	113.72	116.98		113.62		
WEIGHT OF DRY SOIL (grms)	31.28 ✓	29.28 ✓		22.53 ✓		AVE. =
WATER CONTENT (PERCENT)	26.2 ✓	26.0 ✓	AVE. =	16.5 ✓		
CORRECTED VALUES	26.3 ✓	26.1 ✓	26.2 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	26.2 ✓	PLASTICITY INDEX	9.7 ✓
PLASTIC LIMIT (PERCENT)	16.5 ✓	CLASSIFICATION (SYMBOL)	CL (SC)

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMC Date: 1-16-89

QA/QC Checked By: JMK Date: 1-23-89

ATTERBERG LIMITS AIR DRY

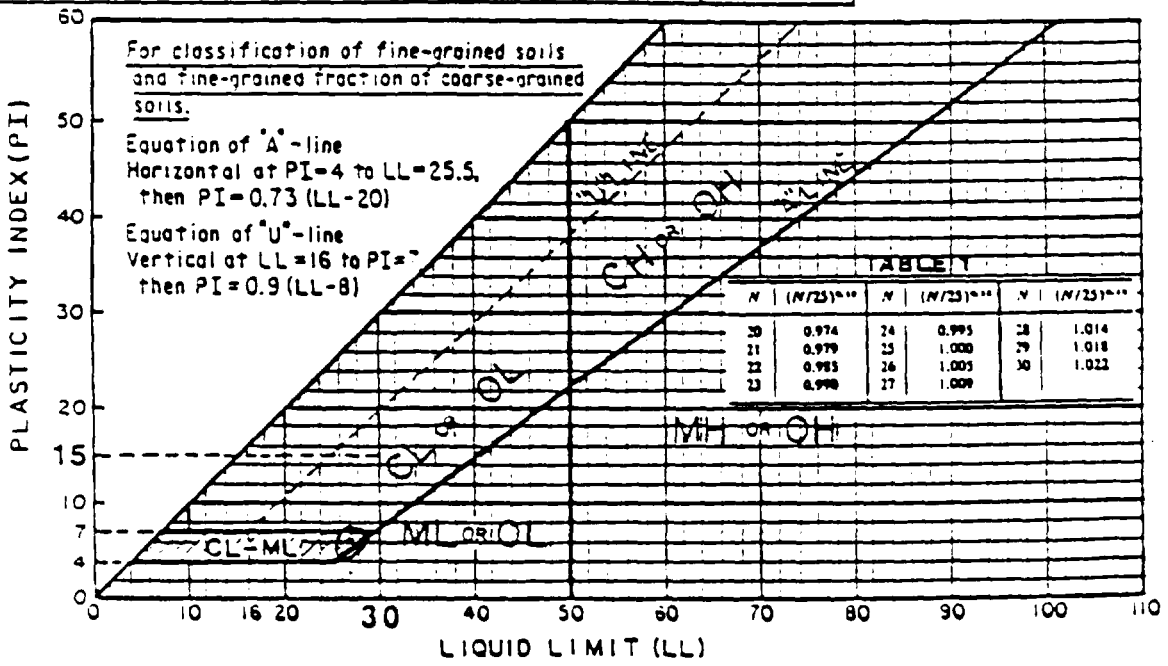
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.23 DATE ~~12-20-88~~ 1-10-89

SAMPLE NO. ALCL-04 DEPTH 1.5 - 2.0' TESTED BY GAP

VISUAL DESCRIPTION DARK BROWN, SANDY SILTY clay to clayey silt

PAN NO. 93R

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G7	G8		G13		
NUMBER OF BLOWS	24	26		—	—	
CAN WEIGHT + WET SOIL (grms)	153.61	147.48		141.03		
CAN WEIGHT + DRY SOIL (grms)	145.28	140.56		136.83		
WEIGHT OF WATER (grms)	8.23	6.92		4.2		
WEIGHT OF CAN (grms)	114.90	114.80		115.94		
WEIGHT OF DRY SOIL (grms)	30.38	25.76		20.89		AVE. =
WATER CONTENT (PERCENT)	27.1	26.9	AVE. =	20.1		
CORRECTED VALUES	27.0	27.0	27.0			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	27.0	PLASTICITY INDEX	6.9
PLASTIC LIMIT (PERCENT)	20.1	CLASSIFICATION (SYMBOL)	CL-ML

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: JOA Date: 1-23-89

ATTERBERG LIMITS

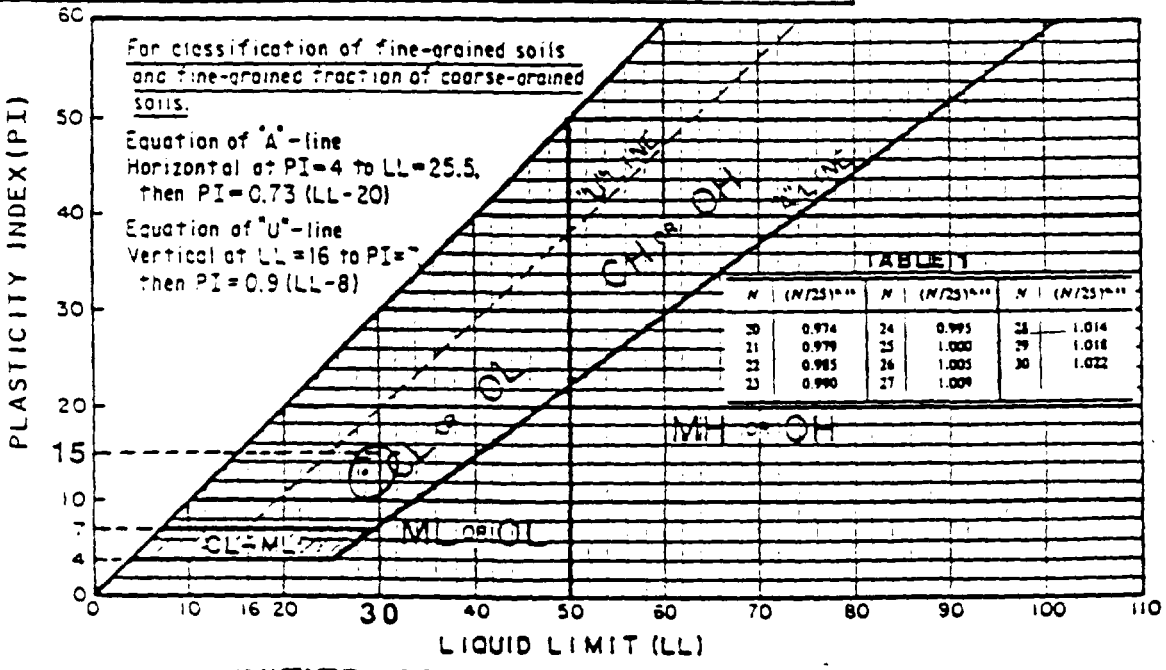
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.23 DATE 12-20-88

SAMPLE NO. ALCL-05 DEPTH .5-2.5' TESTED BY GAP

VISUAL DESCRIPTION REDDISH-BROWN, SILTY CLAY ~~LARGE~~ TRACE GRAVEL

PAN NO. 813

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G14	G16		G1		
NUMBER OF BLOWS	29	27		—	—	
CAN WEIGHT + WET SOIL (grms)	148.44	149.05		142.51		
CAN WEIGHT + DRY SOIL (grms)	141.45	141.31		138.99		
WEIGHT OF WATER (grms)	6.99 ✓	7.74 ✓		3.52 ✓		
WEIGHT OF CAN (grms)	116.31	113.87		116.25		
WEIGHT OF DRY SOIL (grms)	25.14 ✓	27.44 ✓		22.74 ✓		AVE. =
WATER CONTENT (PERCENT)	27.8 ✓	28.2 ✓	AVE. =	15.5 ✓		
CORRECTED VALUES	28.2 ✓	28.5 ✓	28.4 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	28.4 ✓	PLASTICITY INDEX	12.9 ✓
PLASTIC LIMIT (PERCENT)	15.5 ✓	CLASSIFICATION (SYMBOL)	CL

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AM7 Date: 1-16-89

QA/QC Checked By: JOH Date: 1-23-89

ATTERBERG LIMITS

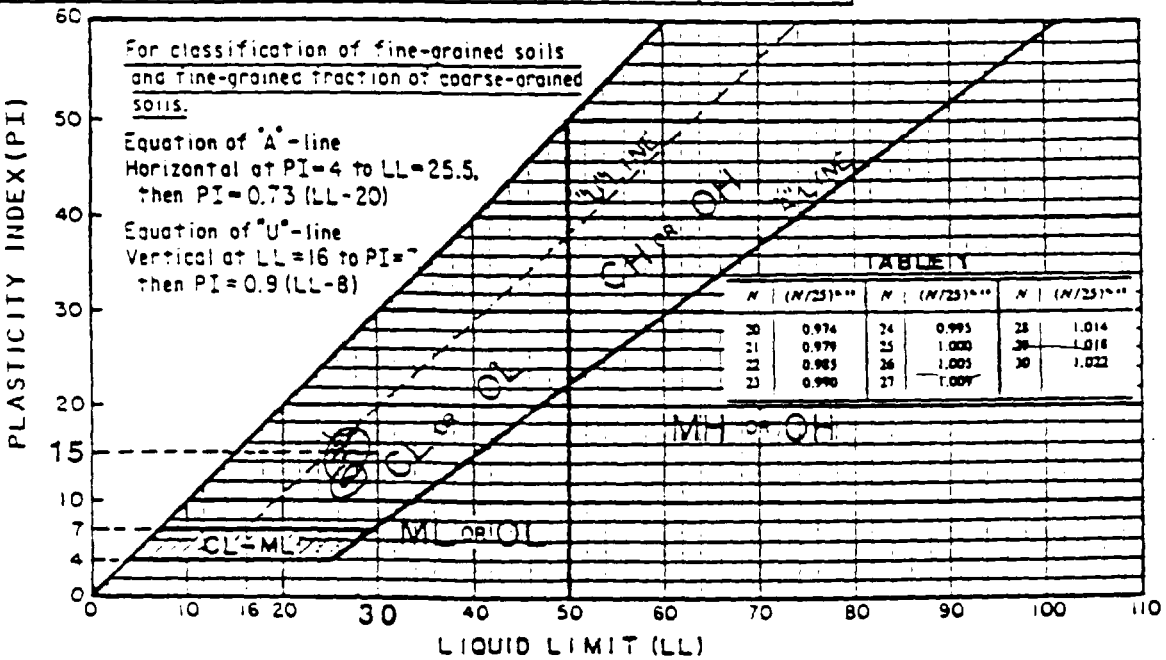
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.23 DATE 12-20-88

SAMPLE NO. ALCL-06 DEPTH 1.5-2.5 TESTED BY GAP

VISUAL DESCRIPTION REDDISH-BROWN, SILTY CLAY, LITTLE GRAVEL

PAN NO. 858

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G16	G17		G2		
NUMBER OF BLOWS	29	26		—	—	
CAN WEIGHT + WET SOIL (grms)	153.72	153.69		146.51		
CAN WEIGHT + DRY SOIL (grms)	145.98	145.57		142.63		
WEIGHT OF WATER (grms)	7.74 ✓	8.02 ✓		3.88 ✓		
WEIGHT OF CAN (grms)	115.91	115.76		116.04		
WEIGHT OF DRY SOIL (grms)	30.07 ✓	29.81 ✓		26.59 ✓		AVE. =
WATER CONTENT (PERCENT)	25.7 ✓	26.9 ✓	AVE. =	14.6 ✓		
CORRECTED VALUES	26.2 ✓	27.0 ✓	26.6 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	26.6 ✓	PLASTICITY INDEX	12.0
PLASTIC LIMIT (PERCENT)	14.6 ✓	CLASSIFICATION (SYMBOL)	CL

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: [illegible] Date: 1-23-89

ATTERBERG LIMITS

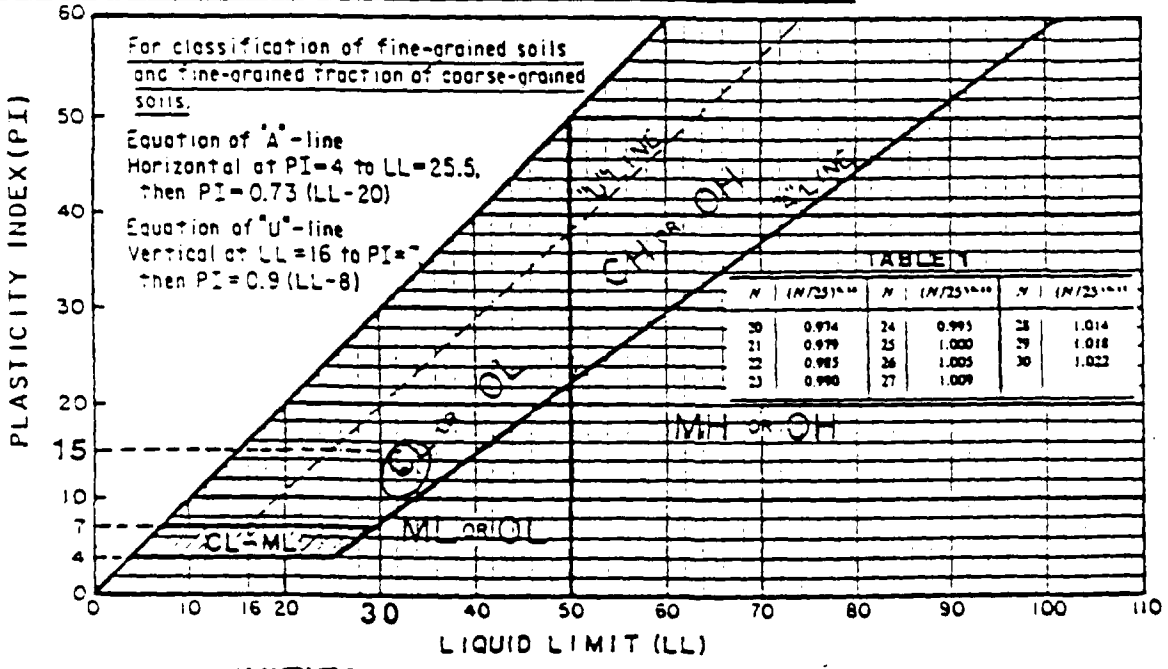
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.23 DATE 1-13-89

SAMPLE NO. ALCL-07 DEPTH .5-1.5' TESTED BY GMP

VISUAL DESCRIPTION REDDISH-BROWN, SILTY CLAYEY Sand, LITTLE GRAVEL

PAN NO. 86B

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G1	G2		G3		
NUMBER OF BLOWS	26	27		—	—	
AN WEIGHT + WET SOIL (grms)	150.55	149.68		146.12		
AN WEIGHT + DRY SOIL (grms)	142.21	141.42		141.10		
WEIGHT OF WATER (grms)	8.34	8.26		5.02		
WEIGHT OF CAN (grms)	116.25	116.04		115.94		
WEIGHT OF DRY SOIL (grms)	25.96	25.38		25.16		AVE. -
WATER CONTENT (PERCENT)	32.1	32.5	AVE. -	20.0		
CORRECTED VALUES	32.3	32.8	32.6			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	32.6	PLASTICITY INDEX	12.6
PLASTIC LIMIT (PERCENT)	20.0	CLASSIFICATION (SYMBOL)	CL (SC)

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: JGH Date: 1-23-89

ATTERBERG LIMITS

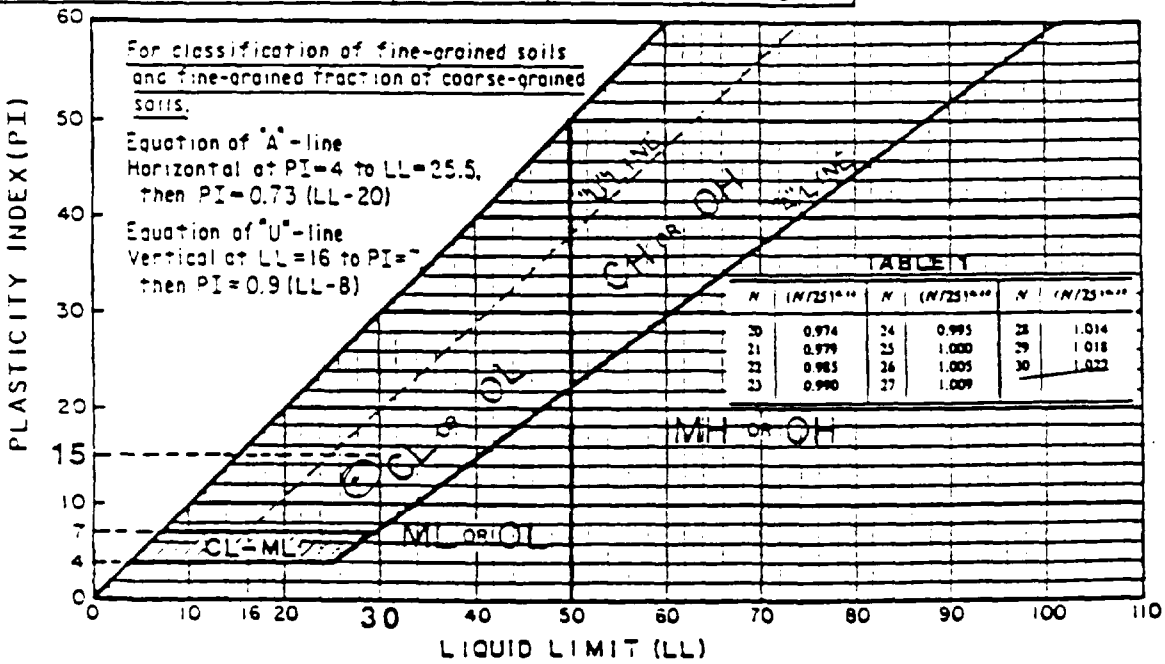
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.23 DATE 1-13-89

SAMPLE NO. ALCL-08 DEPTH 5-20' TESTED BY GAP

VISUAL DESCRIPTION Reddish brown silty clay, little fine sand

PAN NO. 87B

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	63	67		614		
NUMBER OF BLOWS	30	28		—	—	
CAN WEIGHT + WET SOIL (grms)	146.65	156.21		145.05		
CAN WEIGHT + DRY SOIL (grms)	139.51	147.49		141.14		
WEIGHT OF WATER (grms)	7.14 ✓	8.72 ✓		3.91 ✓		
WEIGHT OF CAN (grms)	113.84	114.89		116.31		
WEIGHT OF DRY SOIL (grms)	25.67 ✓	32.6 ✓		24.83 ✓		AVE. =
WATER CONTENT (PERCENT)	27.8 ✓	26.7 ✓	AVE. =	15.7 ✓		
CORRECTED VALUES	28.4 ✓	27.1 ✓	27.8 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	27.8 ✓	PLASTICITY INDEX	12.1 ✓
PLASTIC LIMIT (PERCENT)	15.7 ✓	CLASSIFICATION (SYMBOL)	CL (SC)

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: JAH Date: 1-23-89

ATTERBERG LIMITS

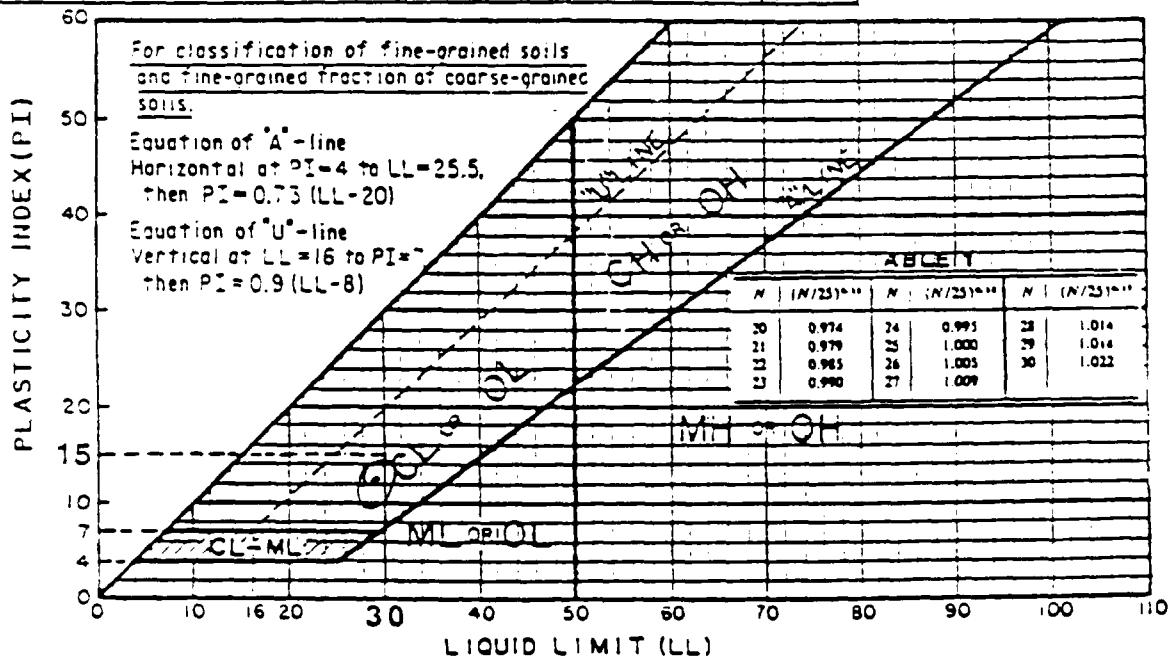
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.23 DATE 1-13-89

SAMPLE NO. ALCL-09B DEPTH 0.5-1.8' TESTED BY GAP

VISUAL DESCRIPTION REDDISH-BROWN, SILTY CLAY, LITTLE GRAVEL

PAN NO. 983

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G5	G6		G16		
NUMBER OF BLOWS	26	26		—	—	
AN WEIGHT + WET SOIL (grms)	146.23	155.37		142.55		
CAN WEIGHT + DRY SOIL (grms)	138.93	146.57		138.70		
WEIGHT OF WATER (grms)	7.3 ✓	8.8 ✓		3.85 ✓		
WEIGHT OF CAN (grms)	113.72	115.96		115.89		
WEIGHT OF DRY SOIL (grms)	25.21 ✓	30.61 ✓		22.81 ✓		AVE. =
WATER CONTENT (PERCENT)	29.0 ✓	28.7 ✓	AVE. =	16.9 ✓		
CORRECTED VALUES	29.1 ✓	28.9 ✓	29.0 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	29.0 ✓	PLASTICITY INDEX	12.1 ✓
PLASTIC LIMIT (PERCENT)	16.9 ✓	CLASSIFICATION (SYMBOL)	CL

RMT, INC.
ATTERBERG LIMITS
(ASTM D4318)
F-238 (R10-86)

Calculations Checked By: AMZ Date: 1-16-89

QA/QC Checked By: [illegible] Date: 1-23-89

ATTERBERG LIMITS

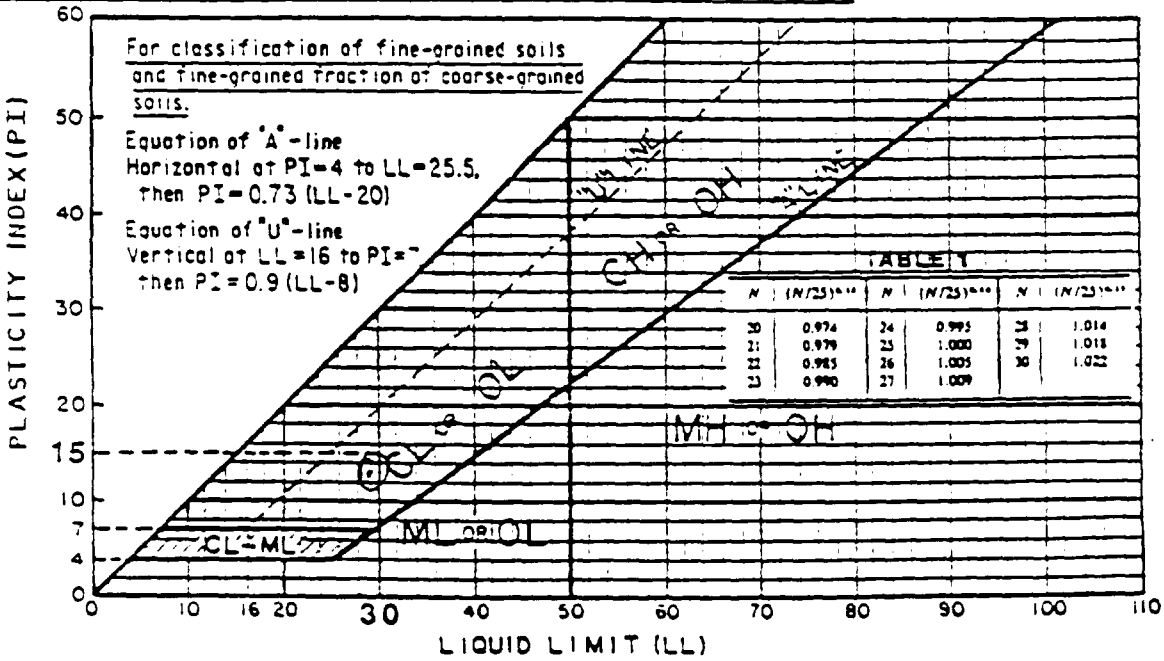
PROJECT NAME ALGOMA LF RI/FS PROJECT NO. 1493.25 DATE 1-13-88

SAMPLE NO. AL CL-10 DEPTH 1.0-1.5' TESTED BY GAP

VISUAL DESCRIPTION REDDISH-BROWN, SILTY CLAY, some FINE GRAVEL

PAN NO. 90B

	LIQUID LIMIT			PLASTIC LIMIT		
CAN NUMBER	G8	G9		G12		
NUMBER OF BLOWS	24	24		—	—	
CAN WEIGHT + WET SOIL (grms)	153.19	150.09		141.08		
CAN WEIGHT + DRY SOIL (grms)	144.56	142.02		137.57		
WEIGHT OF WATER (grms)	8.64 ✓	8.07 ✓		3.51 ✓		
WEIGHT OF CAN (grms)	114.81	114.64		115.95		
WEIGHT OF DRY SOIL (grms)	29.74 ✓	27.38 ✓		21.62 ✓		AVE. =
WATER CONTENT (PERCENT)	29.1 ✓	29.5 ✓	AVE. =	16.2 ✓		
CORRECTED VALUES	28.9 ✓	29.3 ✓	29.1 ✓			



UNIFIED SOIL CLASSIFICATION SYSTEM
PLASTICITY CHART

TESTING SUMMARY			
LIQUID LIMIT (PERCENT)	29.1 ✓	PLASTICITY INDEX	12.9 ✓
PLASTIC LIMIT (PERCENT)	16.2 ✓	CLASSIFICATION (SYMBOL)	CL

IC Ave 1-25-07

JDH 1-25-07

AMI, Inc.

Falling Head Permeability Test

Test Location: LF 8/2/05

Job #: 1[illegible]

Remarks: 48.5%-GCL, 0.5-0.5"

Tested By: JT-Dan-BP

Tank: H2W

Filter: ALUMN

Cell #: 10

Visual Description:

INPUT VALUES

	Initial	Final
Sample Dia. (cm)	10.05	10.04
Sample Ht. (cm)	2.37	2.72
Tare & Wet (g)	1[illegible]1.1	975.4
Tare & Dry (g)	1[illegible]4.7	493.5
Tare (g)	111.7	77.0
Sample Wt. (g)	469.4	490.4

Permeant: De-[illegible]

Permeant Specific Gravity: 1.00

Sample Specific Gravity: 2.7[illegible] Est.

Confining Pressure (psi): [illegible]

Burette Diameter (in): 0.375

Burette Zero (cm): 100.0

CALCULATED VALUES

MOISTURE (%)	9.3	20.1
WET DENS. (pcf)	120.4	129.2
DRY DENS. (pcf)	110.1	107.6
SATURATION (%)	47.5	95.8

MAXIMUM GRADIENT:	16.5
AVERAGE GRADIENT:	12.1
MAX. EFFECT. STRESS (psi):	6.3
MIN. EFFECT. STRESS (psi):	4.8
AVE. EFFECT. STRESS (psi):	5.5

Date YY	MM	DD	Time HH	MM	Temp °	Press.(psi) BOT	TOP	Readings (cm) CHAN	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0.1
07	1	6	10	0	0	95	93	15.70	2.80	97.20			
07	1	6	10	1	23	93	95	15.70	17.20	82.20	0.0	7.1E-04	
07	1	6	10	2	23	95	93	15.70	26.90	72.10	0.0	7.0E-04	
07	1	7	8	44	0	95	95	8.00	3.25	97.70			
07	1	7	8	45	19	95	95	8.00	12.35	88.60	0.0	1.8E-04	1
07	1	7	8	46	19	93	95	8.00	19.35	81.60	0.0	1.7E-04	1
07	1	7	8	47	19	95	95	8.00	25.05	75.90	0.0	1.7E-04	1
07	1	10	7	33	0	95	95	8.00	2.20	98.40			
07	1	10	7	34	19	95	95	8.00	11.40	89.20	0.0	1.8E-04	1
07	1	10	7	35	19	93	95	8.00	18.70	81.90	0.0	1.8E-04	1
07	1	10	7	36	19	95	95	8.00	24.30	76.30	0.0	1.7E-04	1
07	1	11	8	42	0	95	95	8.60	2.20	99.40			
07	1	11	8	44	21	95	95	8.60	11.30	90.30	0.0	1.5E-04	1
07	1	11	8	45	21	95	95	8.60	18.40	83.20	0.0	1.7E-04	1
07	1	11	8	46	21	95	93	8.60	24.20	77.40	0.0	1.7E-04	1

Average Kv for those rows with a 1 in the Ave. column 1.7E-04 cm/sec
6.9E-05 in/sec

Termination determined by stable Kv and low flow differential

A 0 zero in this column starts a series of measurements

20 for 405-09

RMT, Inc.
Falling Head Permeability Test

Job: [illegible]
Job #: 1[illegible]
Sample: [illegible]
Visual Description:

Date: 13-Jan-09
Tech: RKM
File: ALCMAT
Cell #: 4P

INPUT VALUES

	INIT.	FINAL
Sample Dia. (cm)	2.06	2.04
Sample Ht. (in)	2.17	2.36
Tare & Wet (g)	308.4	620.5
Tare & Dry (g)	291.3	550.3
Tare (g)	115.9	77.0
Sample Wt. (g)	515.2	543.3

Permeant: DEIONIZED TAP WT.
Permeant Specific Gravity: 1.00
Sample Specific Gravity: 2.70 EST.
Confining Pressure (psi): 100.0
Burette Diameter (in): 0.375
Burette Zero (cm): 100.0

CALCULATED VALUES

	INIT.	FINAL
MOISTURE (%)	8.4	14.0
WET DENS. (pcf)	128.9	138.5
DRY DENS. (pcf)	118.9	120.6
SATURATION (%)	84.4	100.9

MAXIMUM GRADIENT: 16.2
AVERAGE GRADIENT: 10.4
MAX. EFFECT. STRESS (psi): 6.2
MIN. EFFECT. STRESS (psi): 4.9
AVE. EFFECT. STRESS (psi): 5.5

Date YY	MM	DD	Time HR	MN	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave 0..
09	1	6	10	23	0	95	95	12.40	2.70	98.60			
09	1	6	10	30	27	95	95	12.20	6.00	94.70	-11.4	1.7E-06	
09	1	6	10	37	27	95	95	12.30	9.20	91.50	0.0	1.3E-06	
09	1	6	10	48	27	95	95	12.30	12.20	88.60	1.7	1.3E-06	
09	1	6	10	54	27	95	95	12.50	18.30	81.90	0.1	1.2E-06	
09	1	9	9	0	0	95	95	11.50	1.60	98.10			
	1	9	9	30	19	95	95	11.50	4.10	95.30	0.0	4.3E-06	
09	1	9	9	34	19	95	95	11.50	7.00	92.70	0.1	3.7E-06	
09	1	9	9	50	19	95	95	11.50	11.40	88.50	2.7	3.7E-06	
09	1	9	10	00	19	95	95	11.50	14.50	85.30	-1.6	3.2E-06	
09	1	9	10	54	19	95	95	11.60	18.50	81.40	1.3	3.2E-06	
09	1	10	8	55	0	95	95	12.10	1.70	98.60			
09	1	10	9	1	20	95	95	12.00	6.00	94.20	-1.1	3.2E-06	
09	1	10	10	4	21	95	95	11.90	14.90	85.30	0.0	3.1E-06	
09	1	10	13	21	22	95	93	11.80	31.00	69.30	0.0	2.7E-06	

Average Kv for those rows with a 1 in the Ave. column 3.0E-06 cm/s
1.2E-06 in/s

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

WA 10A 1-23-89

GMT, Inc.
Falling Head Permeability Test

Job: ALCOA LF #1 Fly
Job #: 1113.23
Sample: CLAY, 0.5-1.5'
Date: 1-23-89
Tech: RNW
File: ALCOA2
Cell #: 2F

Visual Description

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.85	2.84
Sample Ht. (in)	2.38	2.33
Tare & Wet (g)	197.6	505.4
Tare & Dry (g)	187.4	331.5
Tare (g)	116.2	77.1
Sample Wt. (g)	304.1	330.7

Permeant: DEMINERALIZED WATER
Permeant Specific Gravity: 1.00
Sample Specific Gravity: 2.70 Assumed
Confining Pressure (psi): 110.0
Burette Diameter (in): 0.371
Burette Zero (cm): 100.0

CALCULATED VALUES

MOISTURE (%)	11.1	16.3
WET DENS. (pcf)	120.1	136.4
DRY DENS. (pcf)	115.3	117.3
SATURATION (%)	65.1	100.6

MAXIMUM GRADIENT: 16.2
AVERAGE GRADIENT: 12.5
MAX. EFFECT. STRESS (psi): 6.2
MIN. EFFECT. STRESS (psi): 4.8
AVE. EFFECT. STRESS (psi): 5.5

Date YY	MM	DD	Time HH	MM	Temp C	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	A.
89	1	6	10	12	0	95	95	12.20	2.30	97.50			
89	1	6	10	13	18	95	95	12.20	7.50	92.30	0.0	9.9E-05	
89	1	6	10	14	20	95	95	12.20	12.00	87.80	0.0	9.6E-05	
89	1	6	10	15	20	95	95	12.20	15.90	83.90	0.0	9.3E-05	
89	1	6	10	16	20	95	95	12.20	19.30	80.50	0.0	9.1E-05	
89	1	6	10	17	20	95	95	12.20	22.30	77.50	0.0	8.9E-05	
89	1	9	8	54	0	95	95	11.20	2.10	98.20			
89	1	9	8	55	19	95	95	11.20	5.30	95.00	0.0	5.9E-05	
89	1	9	8	56	19	95	95	11.20	8.00	92.30	0.0	5.8E-05	
89	1	9	8	57	19	95	95	11.20	10.70	89.60	0.0	5.7E-05	
89	1	9	8	58	19	95	95	11.20	13.30	87.00	0.0	5.6E-05	
89	1	9	8	59	19	95	95	11.20	15.80	84.70	0.0	5.5E-05	
89	1	10	8	20	0	95	95	12.30	2.50	98.00			
89	1	10	8	22	19	95	95	12.30	8.40	92.10	0.0	5.7E-05	
89	1	10	8	24	19	95	95	12.30	13.60	86.90	0.0	5.7E-05	
89	1	10	8	26	19	95	95	12.30	18.00	82.50	0.0	5.5E-05	
89	1	10	8	28	19	95	95	12.30	21.80	78.70	0.0	5.4E-05	
89	1	11	8	48	0	95	95	13.20	2.30	98.00			
89	1	11	8	50	21	95	95	13.20	8.40	91.90	0.0	5.9E-05	
89	1	11	8	52	21	95	95	13.20	13.60	86.70	0.0	5.7E-05	
89	1	11	8	54	21	95	95	13.20	18.00	82.30	0.0	5.5E-05	
89	1	11	8	56	21	95	95	13.20	21.80	78.50	0.0	5.4E-05	

Average Kv for those rows with a 1 in the Ave. column 5.5E-05 cm/sec
2.2E-05 in/sec

Termination determined by stable Kv and low flow differential
A zero in this column starts a series of measurements

...T, Inc.
Falling Head Permeability Test

QA for 1-23-24

Date: 10-3-89
Tech: MJW
File: FLOW44
Cell #: 3

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.87	2.90
Sample Ht. (in)	5.45	5.43
Tare & wet (g)	1276.6	1307.5
Tare & dry (g)	1057.6	978.0
Tare (g)	116.1	78.1
Sample Wt. (g)	1061.4	1081.0

Permeant: DEAIRED TAP WT.
Permeant Specific Gravity: 1.00
Sample Specific Gravity: 2.71 EST.
Confining Pressure (psi): 100.0
Burette Diameter (in): 0.375
Burette Zero (cm): 100.0

CALCULATED VALUES

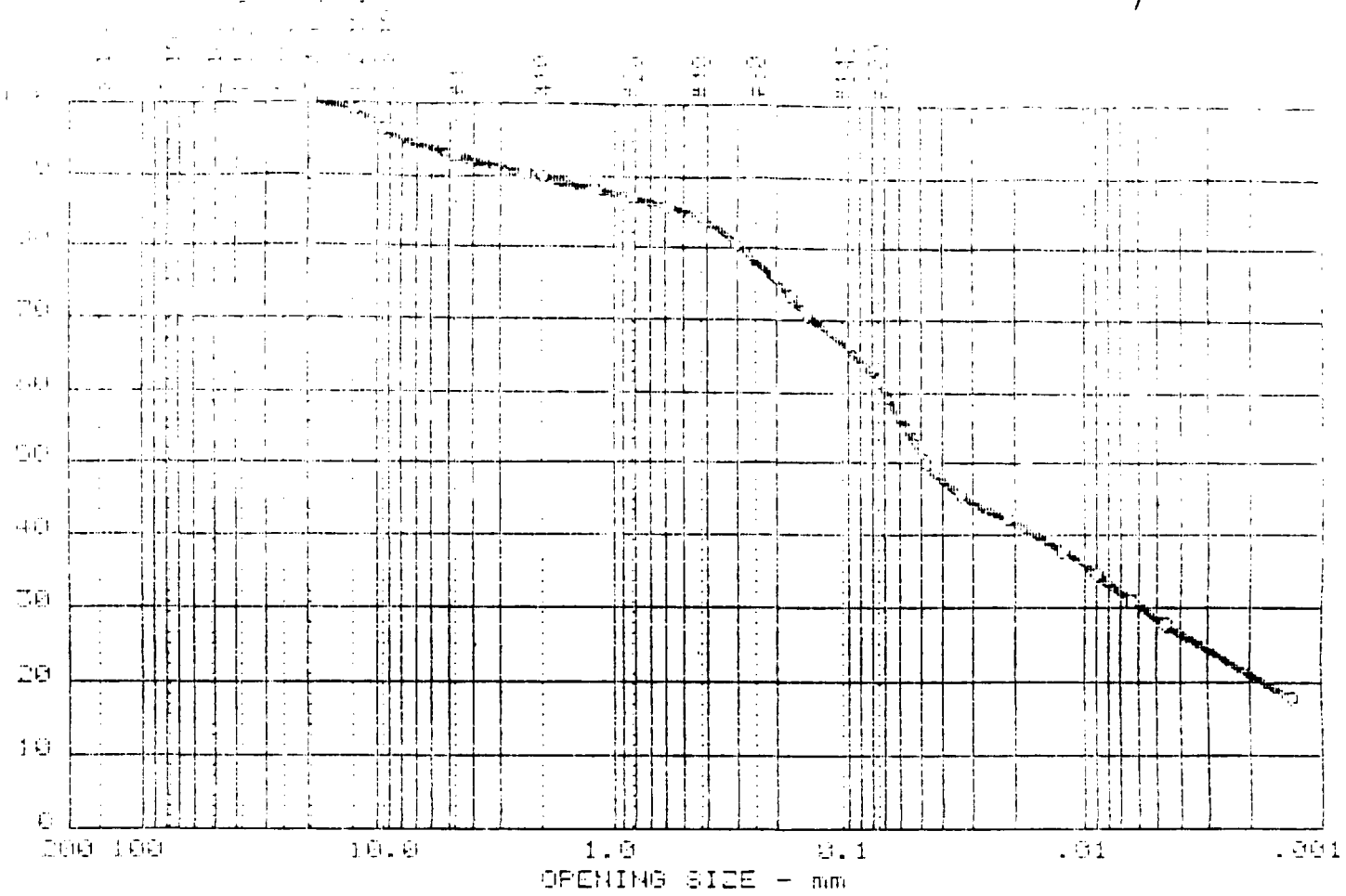
MOISTURE (%)	9.8	16.2
WET DENS. (pcf)	135.3	138.1
DRY DENS. (pcf)	123.3	118.8
SATURATION (%)	71.9	104.7

MAXIMUM GRADIENT: 15.1
AVERAGE GRADIENT: 13.5
MAX. EFFECT. STRESS (psi): 6.4
MIN. EFFECT. STRESS (psi): 4.8
AVE. EFFECT. STRESS (psi): 5.5

Date YY	MM	DD	Time HH	MM	Temp C	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	kv cm/sec	Ave. 0 1
89	1	5	9	53	0	95	95	5.00	4.70	99.40			
89	1	6	11	15	0	95	95	4.10	2.20	99.20			
89	1	8	15	3	21	95	95	4.50	3.95	95.90	10.1	2.2E-07	
89	1	9	7	37	18	95	95	9.70	20.60	73.70	3.2	1.2E-07	
89	1	9	9	1	0	95	95	10.10	3.20	97.90			
89	1	10	10	52	22	95	95	10.10	12.20	89.50	7.4	1.0E-07	
89	1	11	7	15	20	95	95	10.30	16.20	83.50	1.3	8.6E-08	
	1	12	7	20	21	95	95	10.40	20.90	81.20	7.7	8.4E-08	
	1	13	7	11	21	95	95	10.30	25.00	77.20	1.1	8.0E-08	
9	1	17	13	37	23	95	95	11.80	25.85	76.40	7.0	7.7E-08	
89	1	14	10	30	20	95	95	11.80	28.85	73.70	6.3	8.2E-08	
89	1	15	6	44	0	95	95	13.60	2.30	98.00			
89	1	16	13	12	22	95	95	13.80	6.50	96.80	0.1	9.6E-08	
89	1	17	7	13	21	95	95	13.10	7.90	92.70	3.5	7.7E-08	1
89	1	17	14	5	23	95	95	13.40	9.60	91.10	4.6	8.2E-08	1
89	1	18	7	25	22	95	95	13.20	13.35	87.50	1.4	7.9E-08	1

Average kv for those rows with a 1 in the Ave. column 7.9E-08 cm/s
7.1E-10 in/s

Termination determined by stable kv and low flow differential
A 0 zero in this column starts a series of measurements



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	7.2	31.8	32.9	28.0

Classification		LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u
USCS	AASHTO							

MATERIAL DESCRIPTION

TYPE OF TEST

ASTM D 422-63(72)
Hydrometer analysis
Mechanical analysis

Project No.: 1453.23
Project: ALGOMA LF RI/FS
○ Location: ALCL-01

Date: 12-30-88

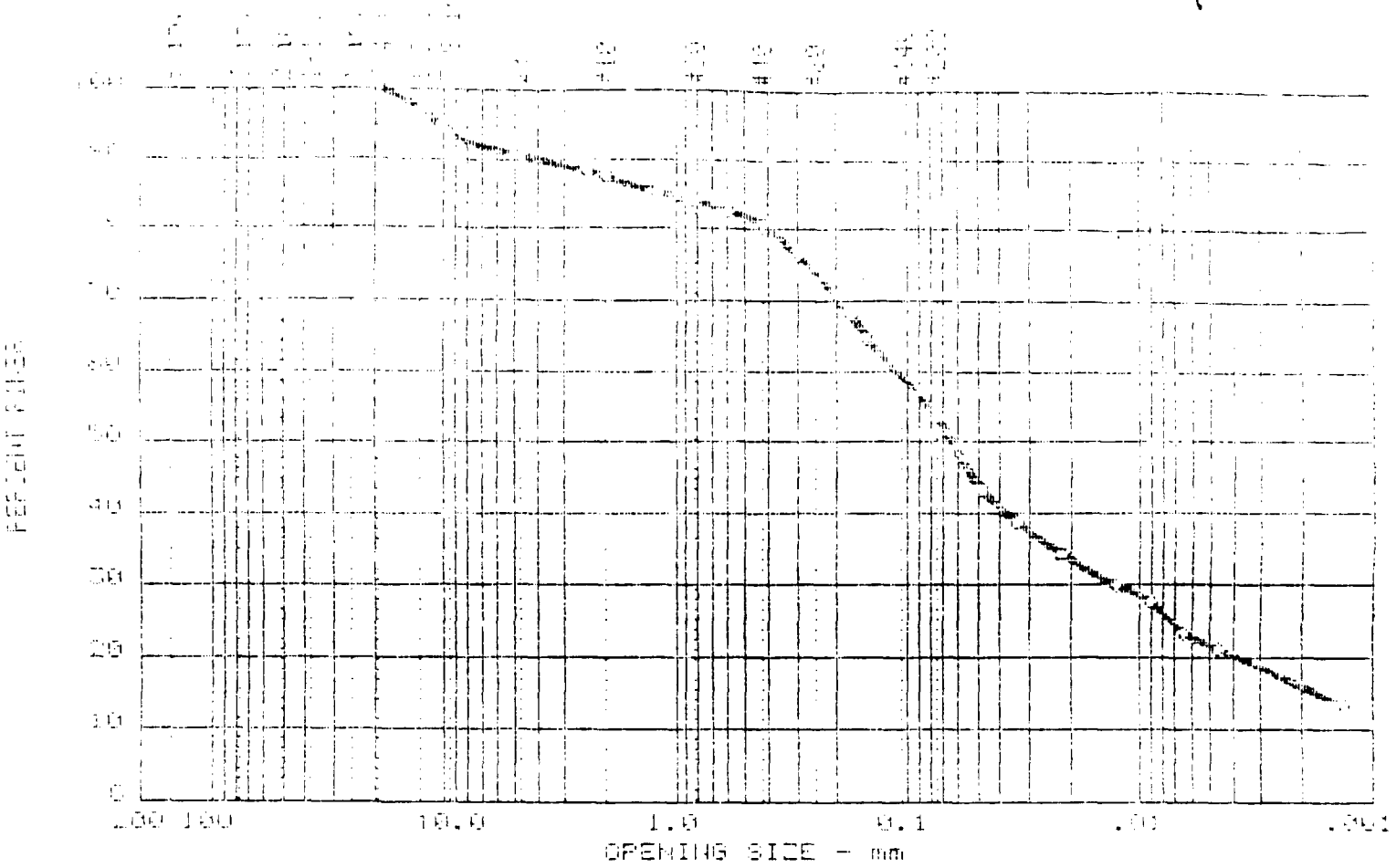
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____

GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	8.4	60.4	31.4	11.7

Classification		LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u
USCS	AASHTO							

MATERIAL DESCRIPTION	TYPE OF TEST
	ASTM D 422-63(72) Hydrometer analysis Mechanical analysis

Project No.: 1493.22
Project: ALBANY LF RI/FS
◇ Location: ALCL-02

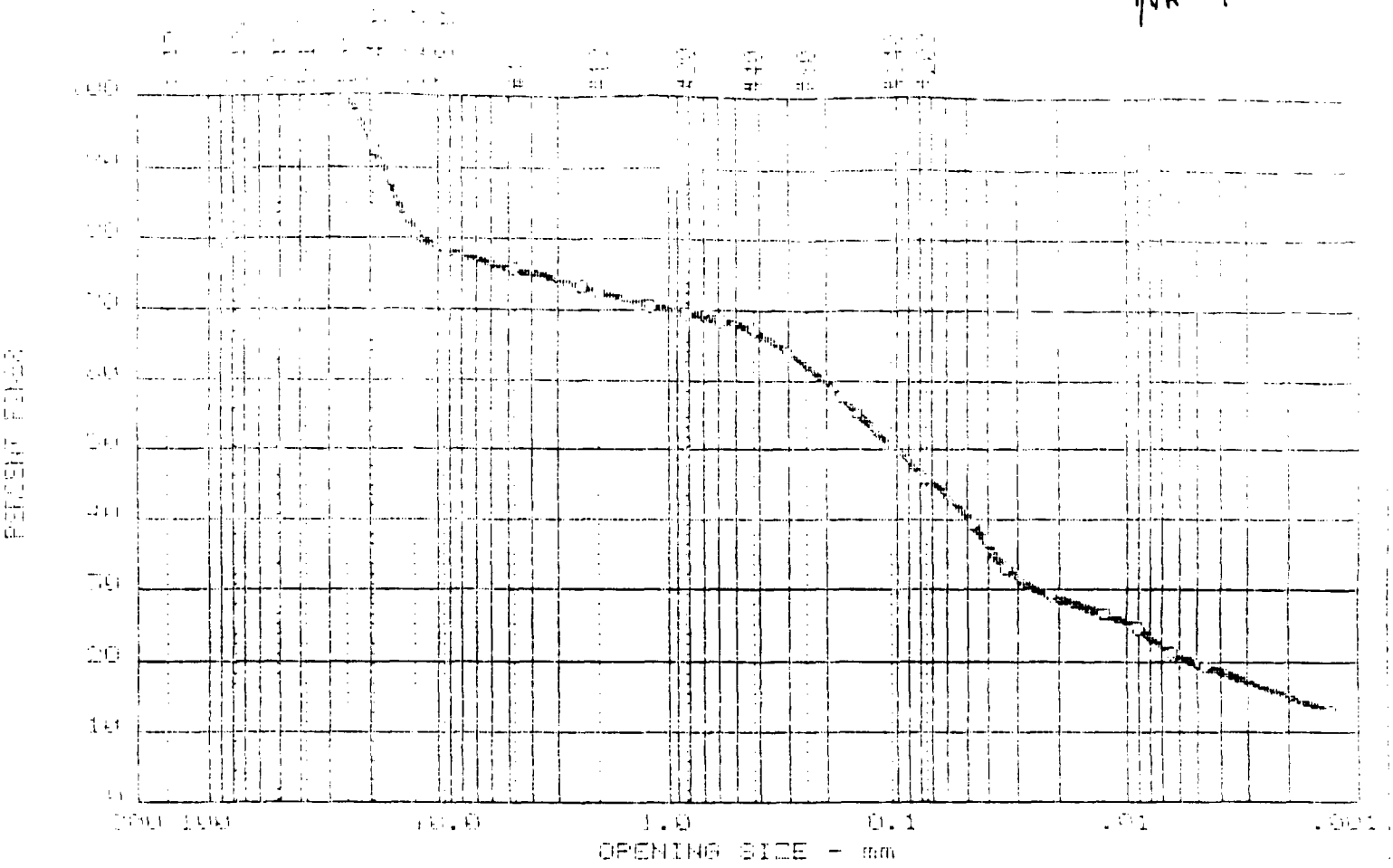
Date: 12-20-89

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	24.1	30.1	25.9	19.9

Classification		LL	PI	D_{60}	D_{50}	D_{10}	C_c	C_u
USCS	AASHTO							

MATERIAL DESCRIPTION

TYPE OF TEST

ASTM D 422-63 (72)
Hydrometer analysis
Mechanical analysis

Project No.: 1493.03
Project: ALGOMA LF RI/FS
Location: ALDL-03

Date: 12-10-88

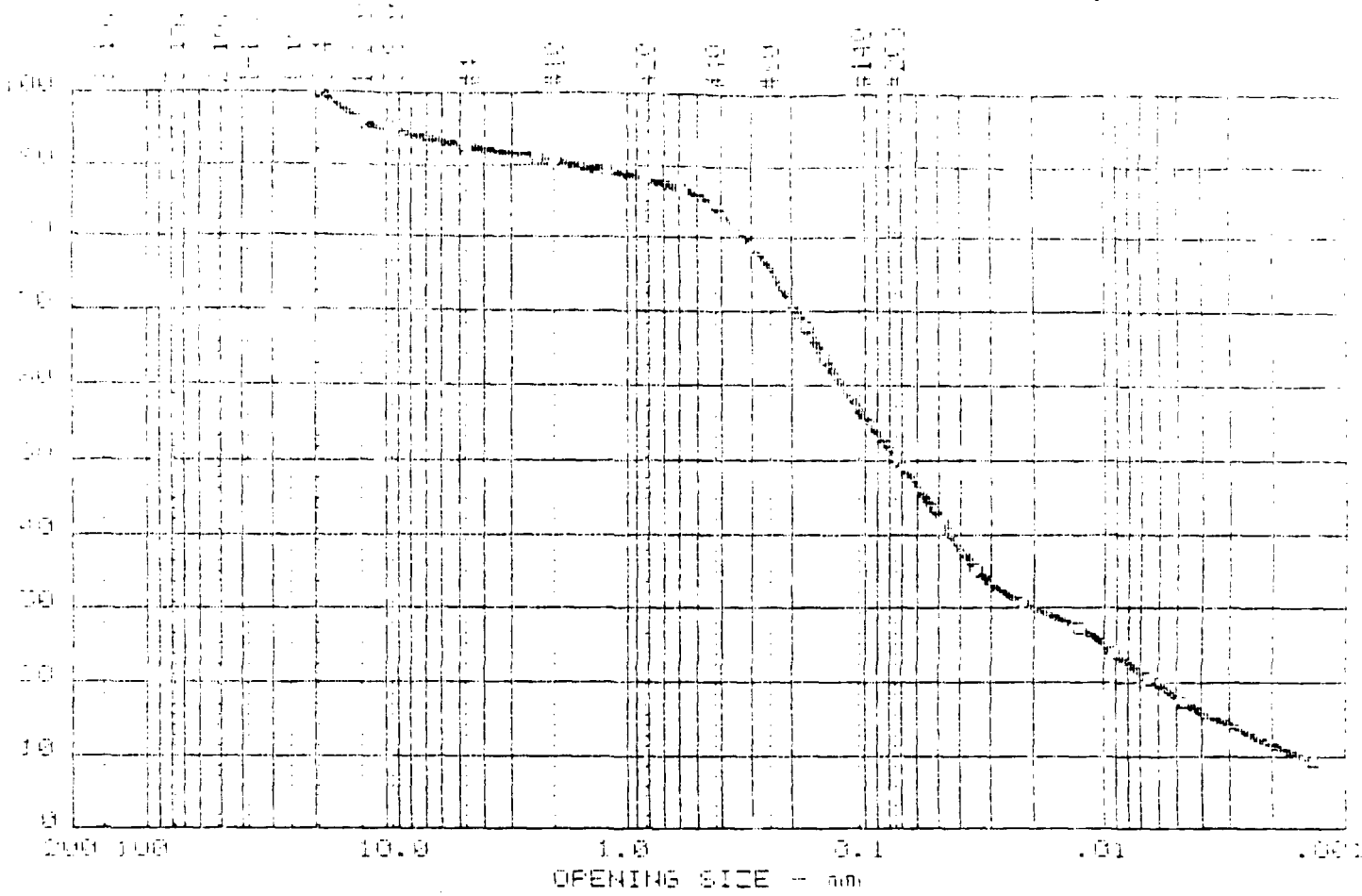
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____

GR JPK 1-23-97



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.4	42.4	32.2	17.5

Classification USCS	Classification AASHTO	LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u
				0.13	0.020	0.0015	2.04	53.2

MATERIAL DESCRIPTION	TYPE OF TEST
	ASTM D -422-63(72) Hydrometer analysis Mechanical analysis

Project No.: 1493.23
Project: ALGOMA LF RI/FS
Q Location: ALCL-04,

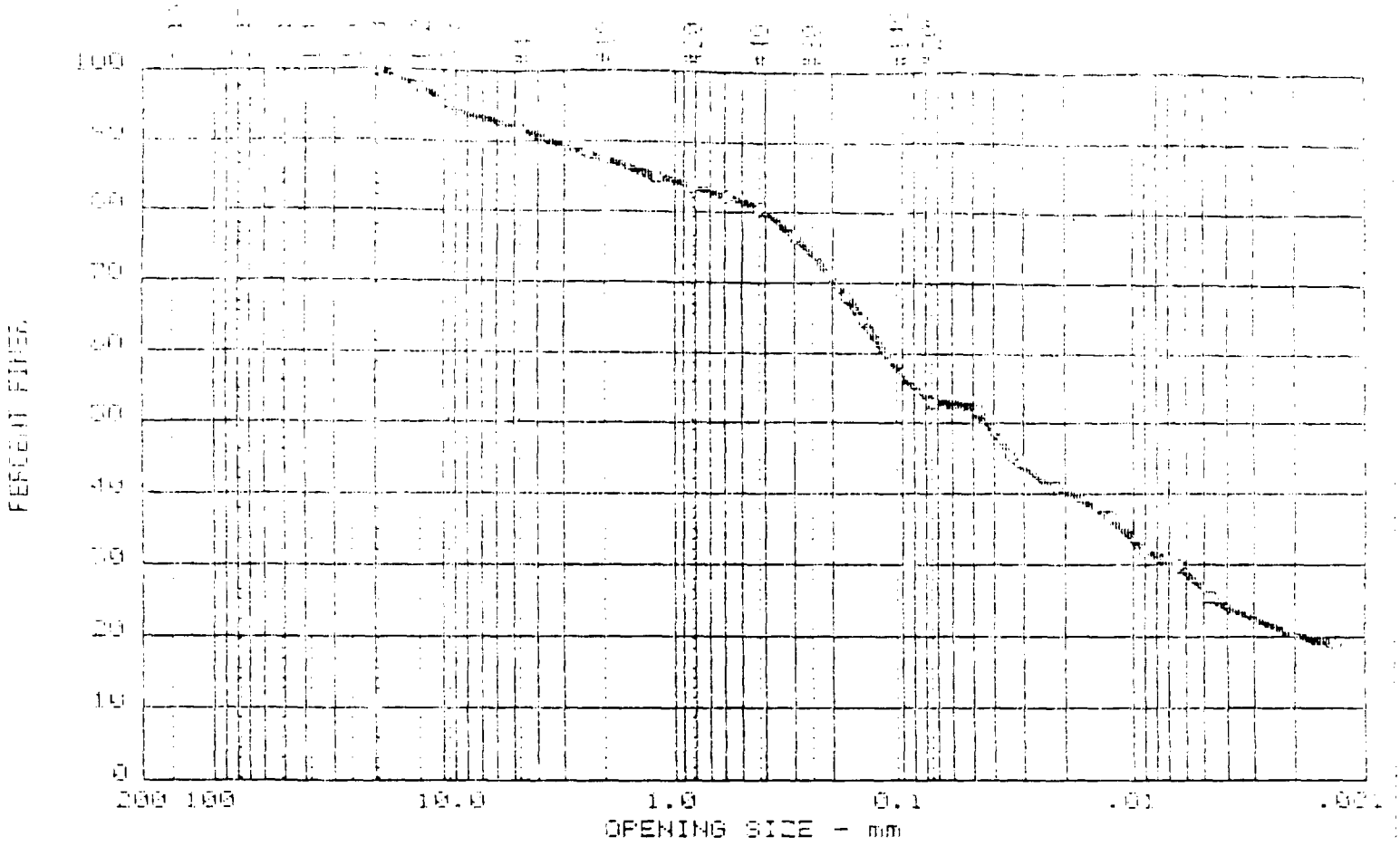
Date: 12-30-96

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____



	%+3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	8.5	38.8	26.1	26.6

Classification		LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u
USCS	AASHTO							

MATERIAL DESCRIPTION

TYPE OF TEST

ASTM D 422-63 (72)
Hydrometer analysis
Mechanical analysis

Project No.: 1493.23
Project: HLOOMA LF RI/FS
○ Location: HLCL-05

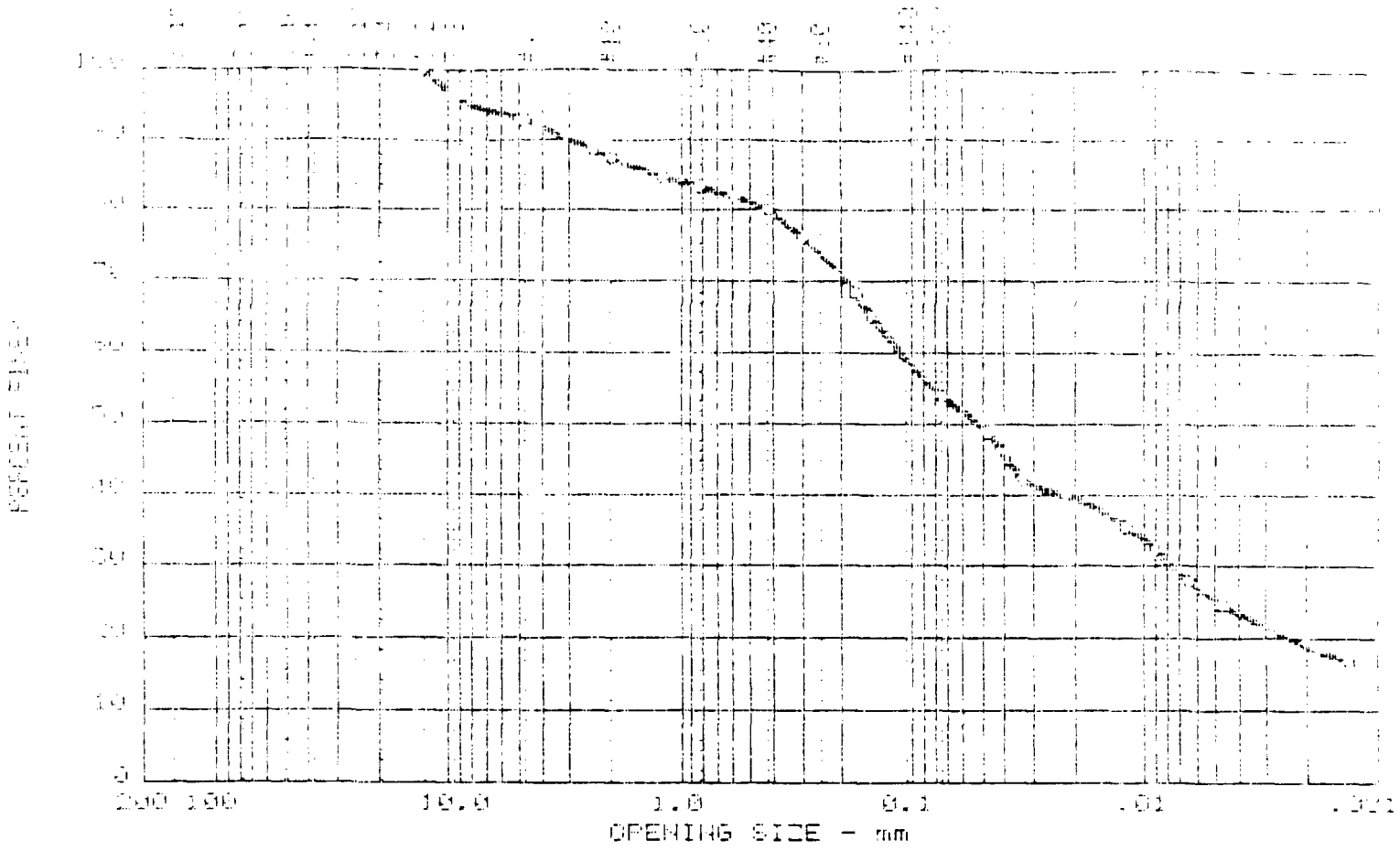
Date: 12-20-93

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____



	% GRAVEL	% SAND	% SILT	% CLAY
	0.0	71.1	28.9	25.2	20.4

Classification USCS	Classification AASHTO	LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u

MATERIAL DESCRIPTION

TYPE OF TEST

ASTM D 422-63 (72)
Hydrometer analysis
Mechanical analysis

Project No.: 1993.22
Project: ALGOMA LF #1 PS
Boring Location: ALCL-MW5

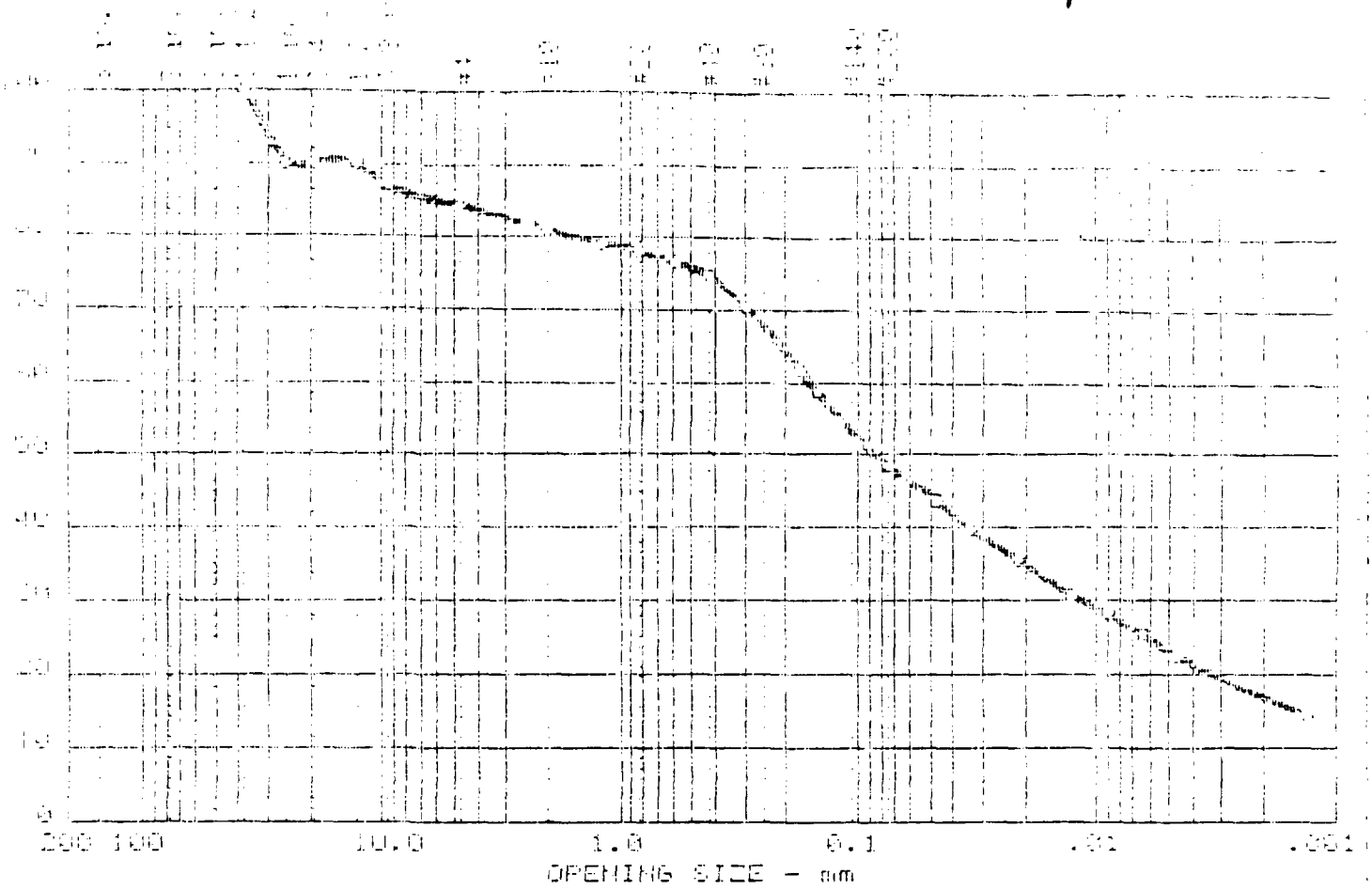
Date: 12-30-89

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

AMT Inc.

Fig. No. ____



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.4	36.2	24.4	29.0

Classification		LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u
USCS	AASHTO							

MATERIAL DESCRIPTION

TYPE OF TEST

ASTM D 422-63 (72)
Hydrometer analysis
Mechanical analysis

Project No.: 1493.23
Project: ALGUNA CF RIVER
Q Location: ALCL-07

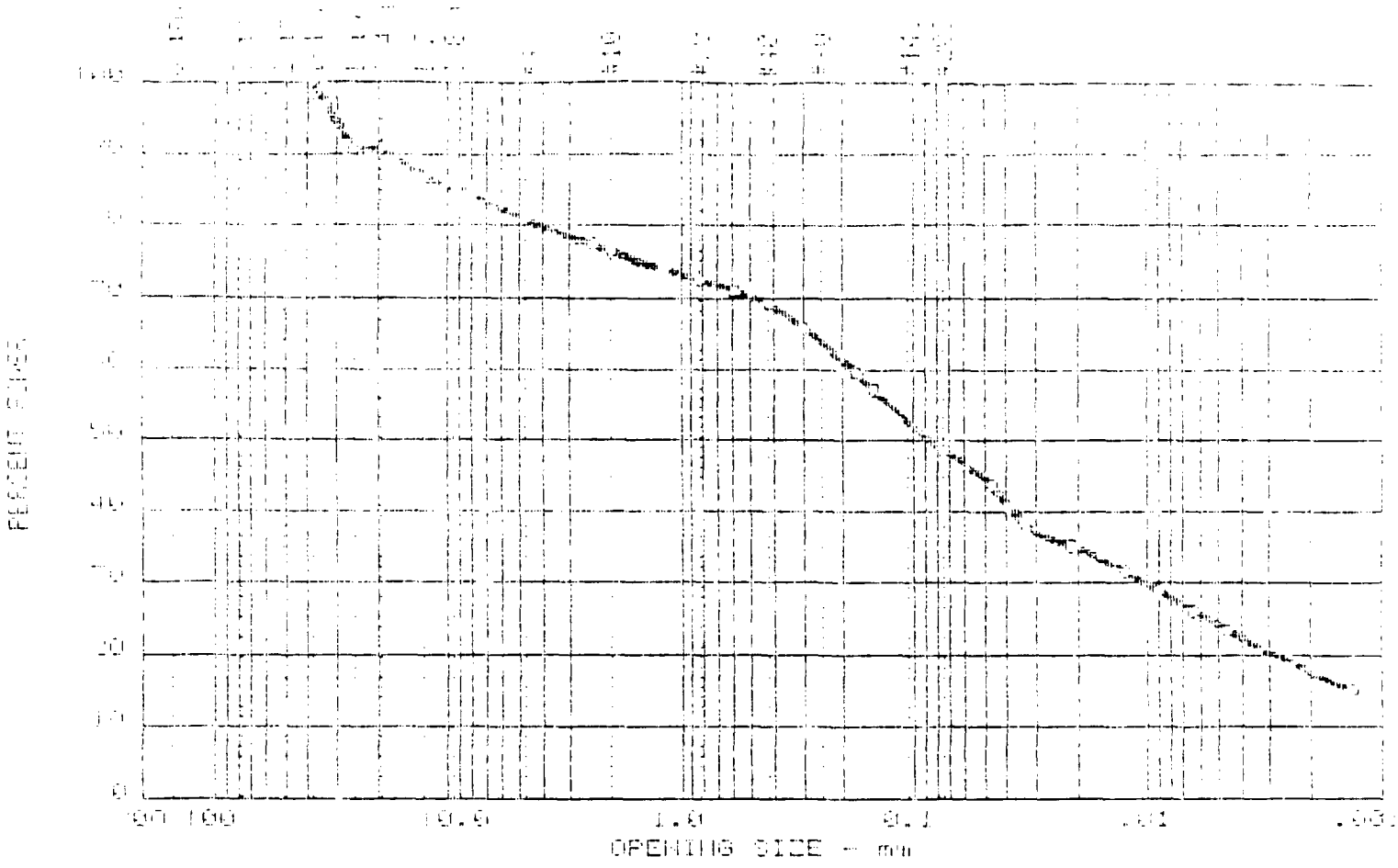
Date: 12-30-88

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____



% GRAVEL	% SAND	% SILT	% CLAY
0.0	32.9	24.7	24.1

Classification USCS	Classification AASHTO	LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u

MATERIAL DESCRIPTION

TYPE OF TEST

ASTM D 422-63(72)
Hydrometer analysis
Mechanical analysis

Project No.: 1497.23
Project: HUDSON LF RI/FS
Location: HLDL-00

Date: 12-30-88

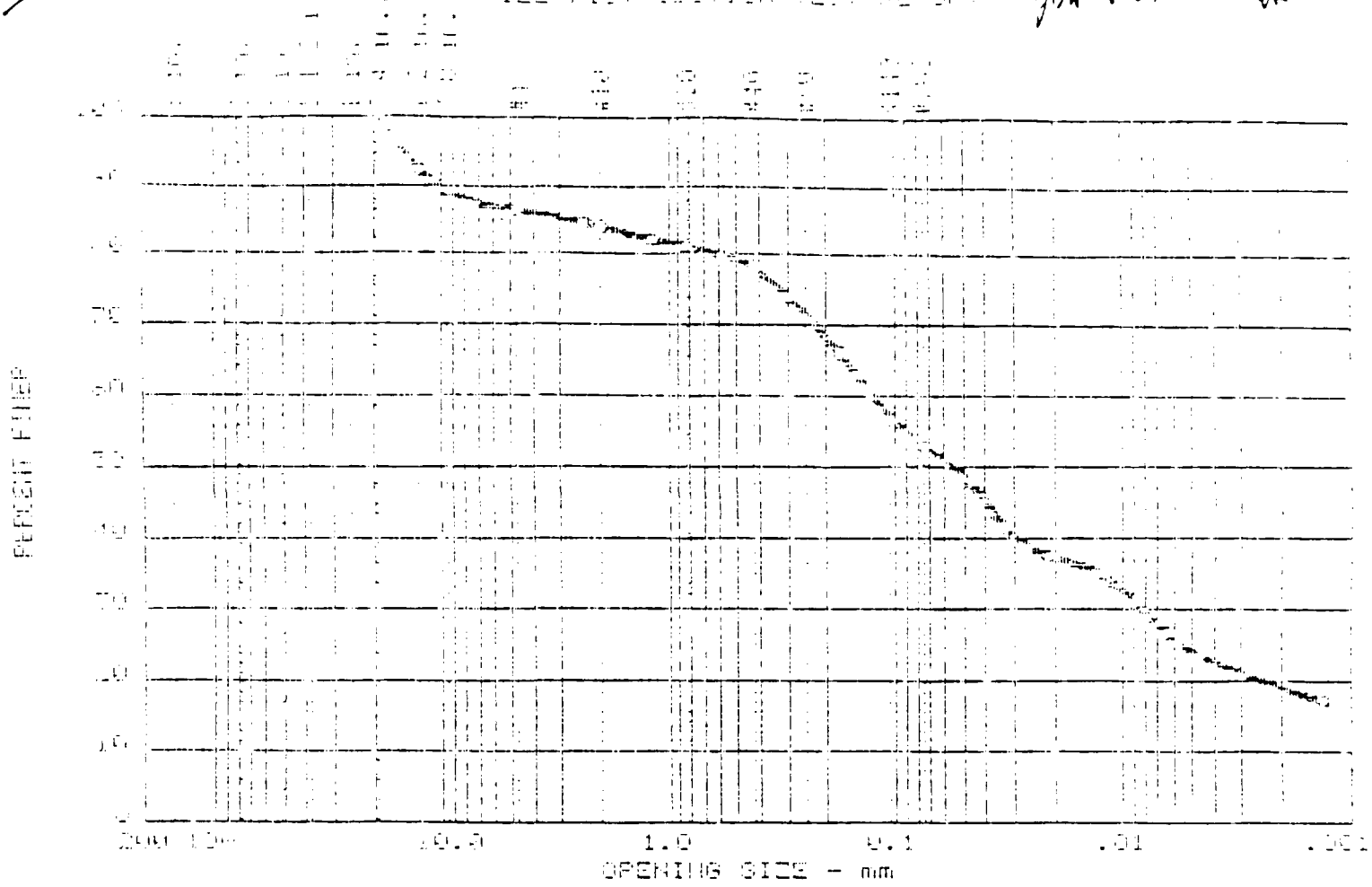
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____

JOH 1-23-24 JA



% GRAVEL	% SAND	% SILT	% CLAY
0.0	37.8	28.7	24.4

USCS	AASHTO	LL	PI	D_{50}	D_{30}	D_{10}	C_c	C_u

MATERIAL DESCRIPTION

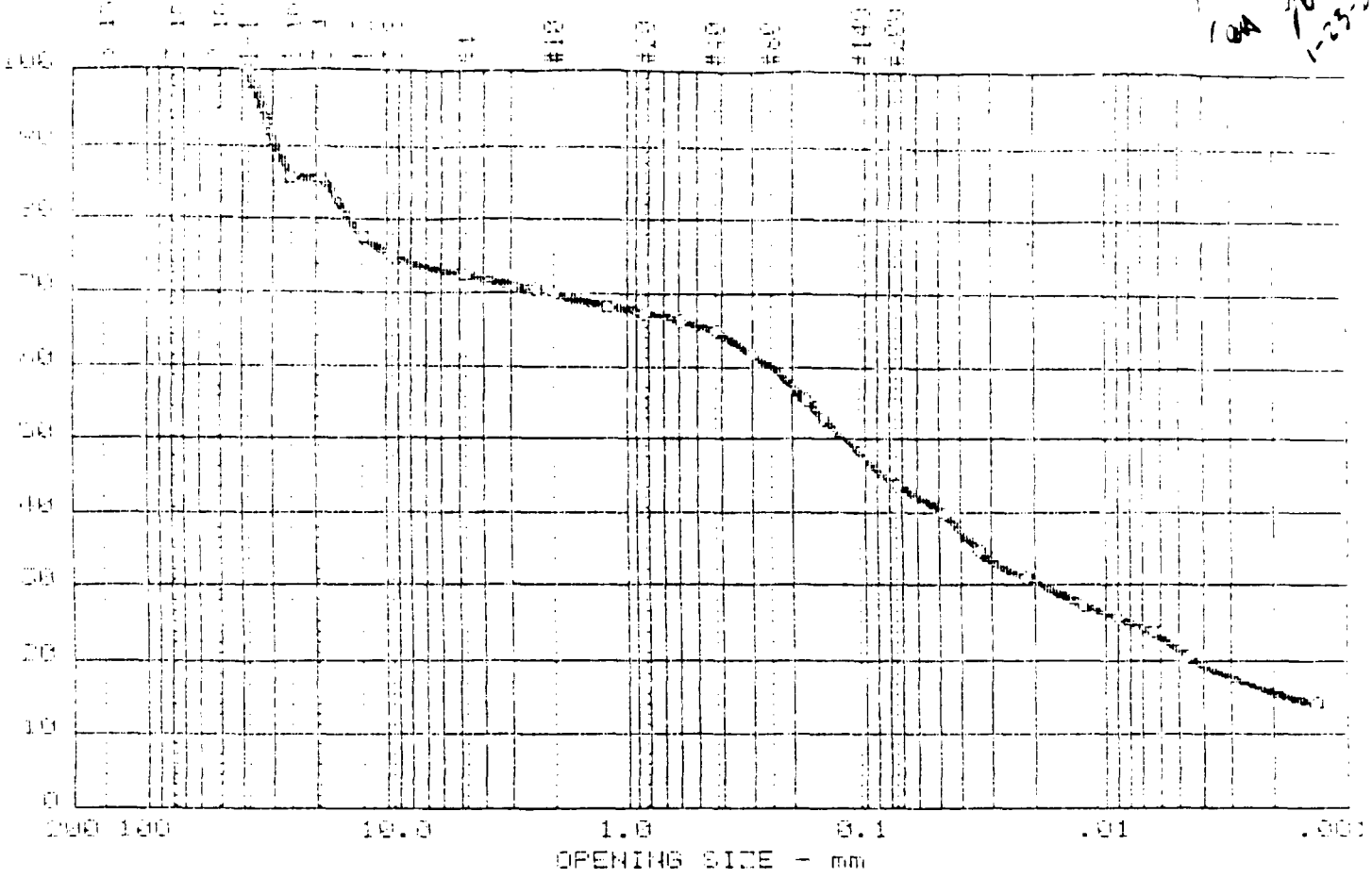
TYPE OF TEST

ASTM D 7928-21
Hydrometer analysis
Mechanical analysis

Project No.: 1470.23

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	27.5	29.0	22.1	21.4

Classification		LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u
USCS	AASHTO							

MATERIAL DESCRIPTION	TYPE OF TEST
	ASTM D 422-63(72) Hydrometer analysis Mechanical analysis

Project No.: 1493.23
Project: HUDSON LF RI/FS
◊ Location: HLCL-10

Date: 12-30-88

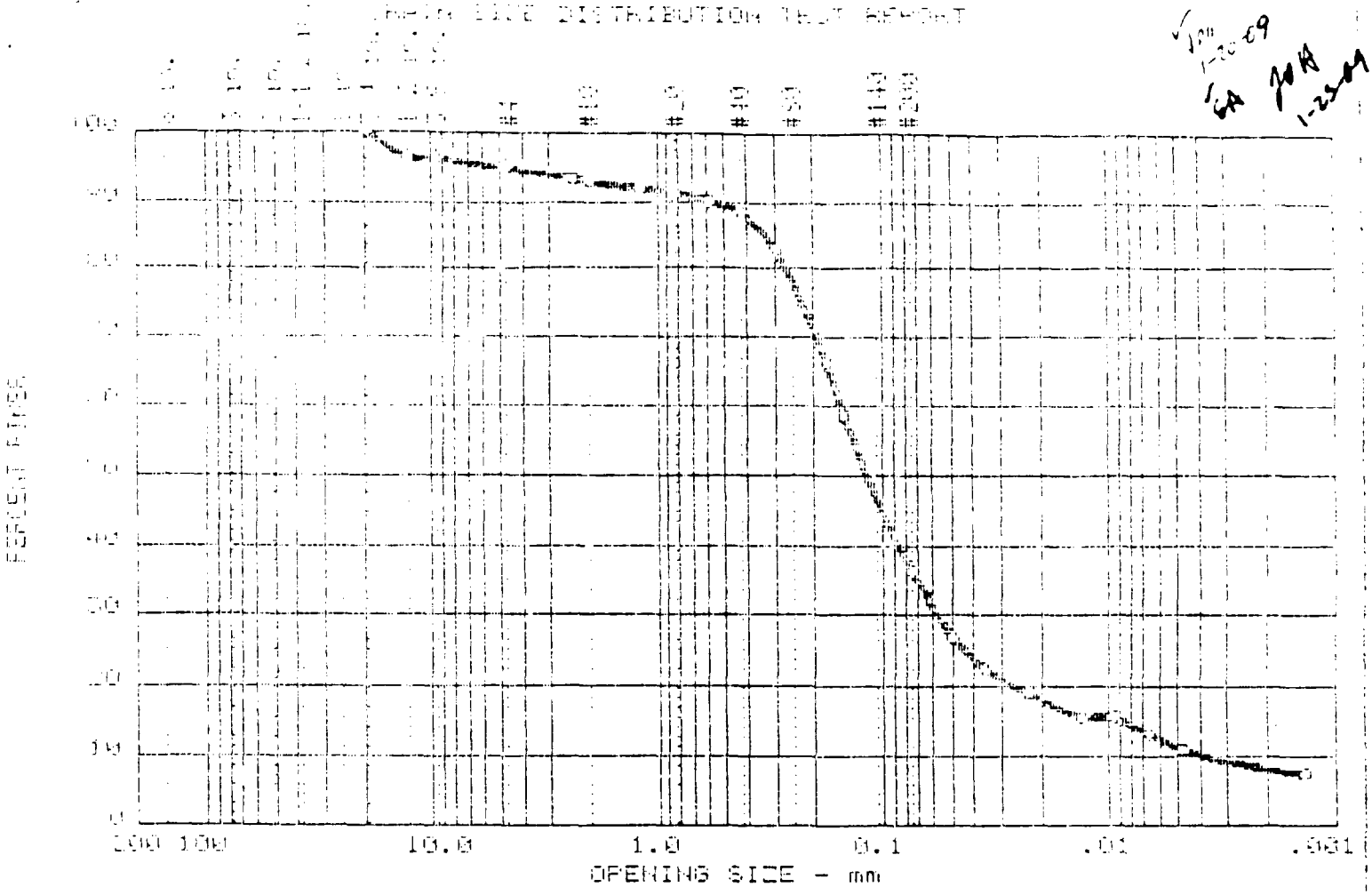
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

BMT Inc.

Fig. No. ____

GRAIN SIZE DISTRIBUTION TEST REPORT



	%+3"	% GRAVEL	% SAND	% SILT	% CLAY
⊠	0.0	3.2	58.7	24.3	13.7

	Classification		LL	PI	D_{60}	D_{30}	D_{10}	C_c	C_u
	USCS	AASHTO							
⊠					0.15	0.057	0.00038	5.82	39.4

MATERIAL DESCRIPTION

TYPE OF TEST

ASTM D -22-s3(72)
Hydrometer analysis
Mechanical analysis

Project No.: 1493.03
Project: ALGOMA LF RI/FS
⊠ Location: ALGL-11

Date: 12-30-88

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT Inc.

Fig. No. ____

TECHNICAL MEMORANDUM
LANDFILL COVER EVALUATION AND TESTING
FIELD WORK SUMMARY

ALGOMA LANDFILL REMEDIAL INVESTIGATION
ALGOMA, WISCONSIN

OCTOBER, 1988

USEPA DOCKET NO. V-W-87-C-036

PREPARED BY
RMT, INC.

Objectives:

The landfill cover evaluation and testing were performed to evaluate the physical characteristics of the cover material of the Landfill Disposal Area (LDA), North Disposal Area (NDA), and South Disposal Area (SDA). No samples were collected from the NDA and SDA. The NDA and SDA were found to have no cover material; therefore, fill/refuse is exposed at the ground surface.

Sections 4 and 7.8 of the Workplan provide additional descriptions of the site, the RI objectives, and the role that the landfill cover evaluation and testing play in the investigation.

Plan Implementation:

The landfill cover samples were collected on October 12, 1988. A 0.5-foot-deep hole was dug with a shovel, saving the turf to be placed again on the hole. The cover material of the Landfill Disposal Area was then sampled using a CME-750 drilling rig and pushing standard 3-inch thin-walled "Shelby" tubes (ASTM Method D 1587-83) below the root zone (0.5 feet) of the vegetation on the material at nine locations (Table

1). The field notes recorded during this part of the RI are included in Attachment A. At locations ALCL-7 and ALCL-9, more than one Shelby tube was collected (two and three respectively - see Table 1) due to poor recovery and damage to tubes by rocks in the ground.

The borehole from which each sample was taken was screened with a photoionization detector (HNU systems Model PI-101 with an 11.7 ev probe) for the presence of VOCs and with an explosivity meter (Neotronics ExoTox™ Gas Monitor Model 40-0FH) for the presence of explosive gas (methane). The measurements did not exceed background levels. The samples were sealed and are stored in RMT's Soils Laboratory awaiting analysis pending USEPA approval of the Quality Assurance Project Plan.

The boreholes were filled with bentonite granules or powder. Approximately one quart of city water was added to promote swelling. The cut-out piece of turf was placed back on the hole.

TABLE 1

SUMMARY OF LANDFILL DISPOSAL AREA COVER SAMPLING

Sample #		Grid Location*		Sampling Interval (feet)	Sample Recovered (feet)
Reference	Field	North	East		
ALCL-1	CML-1	86+00	32+89	0.5 - 2.5	1.2
ALCL-2	CML-2	88+00	34+10	0.5 - 2.5	0.7
ALCL-3	CML-3	86+00	35+34	0.5 - 2.5	1.2
ALCL-4	CML-4	84+00	32+89	0.5 - 2.0	1.5
ALCL-5	CML-5	83+00	34+10	0.5 - 2.5	1.2
ALCL-6	CML-6	84+00	35+34	0.5 - 2.5	1.8
ALCL-7	CML-7	82+00	32+89	0.5 - 1.0	0.5
ALCL-7A	CML-7A	82+00	32+89	0.5 - 1.5	1.0
ALCL-8	CML-8	81+00	34+10	0.5 - 2.0	1.2
ALCL-9	CML-9	82+00	35+34	0.5 - 1.4	0.8
ALCL-9A	CML-9A	82+00	35+34	0.5 - 1.0	0.5
ALCL-9B	CML-9B	82+00	35+34	0.5 - 1.8	1.2

*Refer to Attachment C of the Technical Memorandum for the geophysical investigation submitted on October 21, 1988, for a site map showing the survey grid over the landfill.

1493.40 101:RTA:algo1019T

ATTACHMENT A

FIELD NOTES

153

10-12-88

Clear, sunny, cold (35th)

RMT Personnel TPV

0645 Shaw duller where we can dispose of rock water

0700 all GW-Tech, Nobody home

0705 Dr. Silk

0732 mobilize to CML-8, HNU calibrated

0745 Push CML-8

6" below ground surface

Oxygen 21.4 %

Toxicity 0-2 ppm (zero on our unit)

Explosivity 1 % of LEL

HNU ND ppm (ND. not detected)

in / out hole

14" recovery

Tox is measurement of H_2S!

put bentonite + water + cement

Hole at Top

Gave Doug the GPS coordinates (H&E)

154

0845 Push CML-7

6" below ground surface

Oxy 21.4 %

Tox 1 ppm in/out hole

Ex 1 % of LEL

HNU ND

6" recovery 0.5 to 1.0

~~Push CML-7~~ hit a rock

0815 going to push CML-7A

Oxy 21.4 %

Tox 1 ppm

Ex 1 % of LEL

HNU ND

12" recovery

0.5 - 1.5'

Ambient air

Oxy 21.4 %

Tox 0-2 ppm

Ex 0-1 % of LEL

HNU ND

0825 on CHL-4

Oxy 21.4 %
Tox 1 ppm
Ex 1 %
HNV ND
} in/over hole

18" recovery
Pushed 24" hard for 12 then
easy for 12
recovery: 0.5 - 2.0' deep

0840 on CHL-1

Oxy 21.3 %
Tox 1 ppm
Ex 1 % of LEL
HNV ND
} in/over hole

pushed: 0.5 - 2.5'
Recovery: 1.2'

0850 on CHL-2

0855 sampling CHL-2

Oxy -
Tox -
Ex -
HNV -
} in/over hole

10% Recorded 0855-0900

8" recovery
pushed 0.5 - 2.5'
0.5 - 1.25 hard material (recovery)
1.25 - 2.5 soft no recovery
cinder rock

0910 on CHL-3

Oxy 21.3 %
Tox 1 ppm
Ex 2
HNV ND
} in/over hole

recovery 1.5'
pushed 0.5 - 2.5'

0920 on CHL-6

Oxy 21.3 HNV ND
Tox 1
Ex 2
} in/over hole

labelled B#10

Recovered 21" (1.75')
Pushed 0.5 - 2.5'
Not decked (only one)

0935 at CML - 5
Oxy 21.4
Tox 1
Ex 1
HNV ND
} in/over hole
recovery 14"
pushed 0.5 - 2.5 feet
14"

0950 at CML - 9
Oxy 21.3 %
Tox 1 ppm
Ex 1 % of LEL
HNV ND
} in/over hole
pushed in rock - 0.5 - 1.4'
9" recovered

1000 at CML - 9A
Oxy 21.4 %
Tox 0 ppm
Ex 1 % of LEL
HNV ND
recovery 6"
pushed 0.5 - 1.0'
& CML - 9B about one foot away.

1010 Bench got framed.

1035 Back at CML-9B
Oxy 21.4 %
Tox 1 ppm
Ex 1-2 % LEL
HNV ND
recovery 14"
pushed 0.5 - 1.8'

LOG OF TEST BORING

RMT

BORING NO.:	1
SHEET	1 of 1
PROJECT: Algoma Landfill	PROJECT NO.: 1493.23
LOCATION: Algoma	SURFACE ELEVATION:
DRILLED BY: E. T. I	DATE STARTED: 10-11-88 / DATE COMPLETED: 10-11-88
CREW CHIEF: D. Cruise	LOGGED BY: DC / CHECKED BY: TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3"ST	1.5			0.5	Brn silty sand clay some gravel
					2.5	Sample # ALCL-1

NOTES	WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube	FIRST OCCURENCE:			
	DATE/TIME			
BOREHOLE DIAMETER: 3"	DEPTH TO WATER			
DRILL RIG: CME-76	DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

RMT

LOG OF TEST BORING

BORING NO.: 2
SHEET 1 of 1
PROJECT: Alcoma Land Fill
PROJECT NO.: 1493.23
LOCATION: Alcoma
SURFACE ELEVATION:
DRILLED BY: E T I
DATE STARTED: 10-11-88
DATE COMPLETED: 10-12-88
CREW CHIEF: D Cruise
LOGGED BY: DC
CHECKED BY: TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3"ST	0.75'			0.5	Brn silty clay
					2.0	Change 1.25 - 2.5
						Sample # ALCL-2

NOTES

DRILLING METHODS: Shelby Tube

BOREHOLE DIAMETER: 3"

DRILL RIG: CME-750

WATER LEVEL OBSERVATIONS

FIRST OCCURENCE:

DATE/TIME			
DEPTH TO WATER			
DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

LOG OF TEST BORING

RMT

BORING NO.:	3
SHEET	1 of 1
PROJECT: Alcoma Landfill	PROJECT NO.: 14923
LOCATION: Alcoma	SURFACE ELEVATION:
DRILLED BY: E.T.I	DATE STARTED: 10-12-88 DATE COMPLETED: 10-12-88
CREW CHIEF: D. Carrie	LOGGED BY: DC CHECKED BY: TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3"ST	1.15			0 2.5	Brn silty sandy clay some gravel
						Sample # ALCL-3

NOTES	WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube	FIRST OCCURENCE:			
	DATE/TIME			
BOREHOLE DIAMETER: 3"	DEPTH TO WATER			
DRILL RIG: CME-750	DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

LOG OF TEST BORING

RMT

PROJECT: Alcoa Landfill		BORING NO.: 4	
LOCATION: Alcoa		SHEET 1 of 1	
DRILLED BY: E.T.I.	DATE STARTED: 10-11-88	PROJECT NO.: 14923	DATE COMPLETED: 10-11-88
CREW CHIEF: DC	LOGGED BY: DC	SURFACE ELEVATION:	CHECKED BY: TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3ST				0	Brn Silty Sandy clay some gravel
					2.5	
						Sample # ALCL-4

NOTES		WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube		FIRST OCCURENCE:			
		DATE/TIME			
BOREHOLE DIAMETER: 3"		DEPTH TO WATER			
DRILL RIG: CME-750		DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

LOG OF TEST BORING

RMT

BORING NO.: 5
SHEET 1 of 1
PROJECT: Alcoma Landfill
PROJECT NO.: 1493.23
LOCATION: Alcoma
SURFACE ELEVATION:
DRILLED BY: ETI
DATE STARTED: 10-12-88
DATE COMPLETED: 10-12-88
CREW CHIEF: D Crux
LOGGED BY: DC
CHECKED BY: TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3"ST		1.2		0.5 2.5	Brn Silty Clay some sand with small gravel
						Sample # ALCL-5

NOTES

DRILLING METHODS: Shelby Tube

BOREHOLE DIAMETER: 3"

DRILL RIG: CME - 75

WATER LEVEL OBSERVATIONS

FIRST OCCURENCE:

DATE/TIME			
DEPTH TO WATER			
DEPTH TO CAVE IN			

10-25-88

F-203A (R 09-87)

6 TH

LOG OF TEST BORING

RMT

BORING NO.: 2

SHEET 1 of 1

PROJECT: ALGOMA Landfill

PROJECT NO.:

LOCATION: ALGOMA

SURFACE ELEVATION: 1493.23

DRILLED BY: GTI

DATE STARTED: 10-12-88

DATE COMPLETED: 10-12-88

CREW CHIEF: D Crick

LOGGED BY: DC

CHECKED BY: TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3"ST		1.65		0 2.5	Brn silty sand clay small gravel

Sample # ALCL-6

NOTES

DRILLING METHODS: Shelby Tube

BOREHOLE DIAMETER: 3"

DRILL RIG: CME-750

WATER LEVEL OBSERVATIONS

FIRST OCCURENCE:

DATE/TIME			
DEPTH TO WATER			
DEPTH TO CAVE IN			

F-203A (R 09-87)

10-2500

LOG OF TEST BORING

RMT

BORING NO.:	7
SHEET	1 of 1
PROJECT:	Al Gomo Landfill
PROJECT NO.:	1493.23
LOCATION:	Algoma
SURFACE ELEVATION:	
DRILLED BY:	ETI
DATE STARTED:	10-11-88
DATE COMPLETED:	10-11-88
CREW CHIEF:	D Cruise
LOGGED BY:	D Cruise
CHECKED BY:	TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3"ST			0.5-AB	0.5	~~Dk Brn Silty Sand w/ Org Matter~~ Brn Silty Sand w/ Org Matter some gravel
						EOB 10
						Sample # ALCL-7

NOTES	WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube	FIRST OCCURENCE:			
	DATE/TIME			
BOREHOLE DIAMETER: 3"	DEPTH TO WATER			
DRILL RIG: CME-75U	DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

LOG OF TEST BORING

RMT

BORING NO.:	7A
SHEET	1 of 1
PROJECT:	Alabama Landfill
PROJECT NO.:	1493.23
LOCATION:	Alabama
SURFACE ELEVATION:	
DRILLED BY:	E.T.I.
DATE STARTED:	10-11-88
DATE COMPLETED:	10-11-88
CREW CHIEF:	D. Arnise
LOGGED BY:	D.C
CHECKED BY:	TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1		1.0		1054	1.5	Brn silty top soil Brn silty sandy clay & sand/ gravel
						Sample # ALCL-7A

NOTES		WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube		FIRST OCCURENCE:			
		DATE/TIME			
BOREHOLE DIAMETER: 3"		DEPTH TO WATER			
DRILL RIG: CME-750		DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

LOG OF TEST BORING

RMT

BORING NO.:	8
SHEET	of
PROJECT:	Niagara Landfill
PROJECT NO.:	1493.23
LOCATION:	Niagara
SURFACE ELEVATION:	
DRILLED BY:	ETI
DATE STARTED:	10.11.88
DATE COMPLETED:	10.11.88
CREW CHIEF:	DC
LOGGED BY:	DC
CHECKED BY:	TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3"ST				.5	DK BRN. SILTY TOP SOIL
					2.0	BRN SANDY SILT SOME BRN GRAVEL
						EOB 2.0
						Sample # ACL-8

NOTES	WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby tubes	FIRST OCCURENCE:			
	DATE/TIME			
BOREHOLE DIAMETER: 3"	DEPTH TO WATER			
DRILL RIG: CME-750	DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

LOG OF TEST BORING

RMT

BORING NO.:	9
SHEET	1 of 1
PROJECT:	Algoma Land Fill
PROJECT NO.:	1493.23
LOCATION:	Algoma
SURFACE ELEVATION:	
DRILLED BY:	ET
DATE STARTED:	10-28-88
DATE COMPLETED:	10-28-88
CREW CHIEF:	DC
LOGGED BY:	DC
CHECKED BY:	TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
1	3" ST		75		0	Brn silty sandy clay small gravel
						Sample # ALCL-9

NOTES		WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube		FIRST OCCURENCE:			
		DATE/TIME			
BOREHOLE DIAMETER: 3"		DEPTH TO WATER			
DRILL RIG: CME-750		DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

LOG OF TEST BORING

RMT, Inc.

BORING NO.:	9A
SHEET	1 of 1
PROJECT:	Alcoma Landfill
PROJECT NO.:	1493.23
LOCATION:	Alcoma
SURFACE ELEVATION:	
DRILLED BY:	GTI
DATE STARTED:	10-12-88
DATE COMPLETED:	10-12-88
CREW CHIEF:	DC
LOGGED BY:	DC
CHECKED BY:	JPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	RECOVERY %	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
					.5 1.0	See BH9
						Sample # ALCL-9A

NOTES	WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube	FIRST OCCURENCE:			
	DATE/TIME			
BOREHOLE DIAMETER: 3"	DEPTH TO WATER			
DRILL RIG: CME-750	DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

RMT

LOG OF TEST BORING

BORING NO.:	9B
SHEET	1 of 1
PROJECT: Algoma Landfill	PROJECT NO.: 1493.23
LOCATION: Algoma	SURFACE ELEVATION:
DRILLED BY: GTI	DATE STARTED: 10-12-88 DATE COMPLETED: 10-12-88
CREW CHIEF: DC	LOGGED BY: DC CHECKED BY: TPV

SAMPLING NOTES NO.	TYPE	RECOVERY BLOWS	%	ELEV. (ft.)	DEPTH (ft.)	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
					15 13	See Bldg
						Sample # ALCL-9B

NOTES	WATER LEVEL OBSERVATIONS			
DRILLING METHODS: Shelby Tube	FIRST OCCURENCE:			
	DATE/TIME			
BOREHOLE DIAMETER: 3"	DEPTH TO WATER			
DRILL RIG: CME-750	DEPTH TO CAVE IN			

F-203A (R 09-87)

10-25-88

RS-3310-1D

10/1/84

COPY

SEPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION
01 STATE: WI | 02 SITE NUMBER: WID980610380

II. SITE NAME AND LOCATION

01 SITE NAME: Algoma Landfill
02 STREET, ROUTE NO. OR SPECIFIC LOCATION IDENTIFIER: W. Hwy 54 ; T25N, R25E Sec. 32
03 CITY: Algoma
04 STATE: WI | 05 ZIP CODE: 54201 | 06 COUNTY: Kewaunee | 07 COUNTY CODE: 061 | 08 CONG. DIST: 08
09 COORDINATES: LATITUDE 44°35'47" | LONGITUDE 87°29'28"
10 TYPE OF OWNERSHIP: ☐ A PRIVATE ☐ B FEDERAL ☐ C STATE ☐ D COUNTY ☒ E MUNICIPAL ☐ F OTHER ☐ G UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 8 14 84 (MO. DAY YEAR)
02 SITE STATUS: ☐ ACTIVE ☐ INACTIVE
03 YEARS OF OPERATION: 1969 (BEGINNING YEAR) | 1983 (ENDING YEAR) ☐ UNKNOWN
04 AGENCY PERFORMING INSPECTION (Check all that apply):
☐ A EPA ☒ B EPA CONTRACTOR (Ecology & Environment) ☐ C MUNICIPAL ☐ D MUNICIPAL CONTRACTOR
☐ E STATE ☐ F STATE CONTRACTOR (Specify) ☐ G OTHER (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO
Anne C. Sause	Team Leader / Biologist	Ecology & Environment	(312) 663-9415
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO
Kurt Sims	Earth Scientist	Ecology & Environment	(312) 663-9415
Bruce Sypniewski	Geologist	Ecology & Environment	(312) 663-9415
Terry Hegeman	Hazardous Waste Specialist	LMD / Wisc. Dept. of Natural Resources	(414) 497-4061
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Mr. Norbert Dier	Director of Streets	City Garage 1520 Jefferson, Algoma	(414) 487-2391
Mr. Gene Hojan	Professional Engineer	Brey, Stueve & Braun, Inc. 709 Washington St. Manitowoc, WI 54220-4884	( ) 684-5583
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY: ☒ PERMISSION ☐ WARRANT
18 TIME OF INSPECTION: 7:00 am
19 WEATHER CONDITIONS: Warm, Sunny, light breeze

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Terry Hegeman	Lake Mich. Dist. Wisc. Dept. of Natural Resources	(414) 497-4061
04 PERSON RESPONSIBLE FOR SUBMITTING INSPECTION FORM	05 AGENCY	06 ORGANIZATION
Anne C Sause	FIT / USEPA	Ecology & Environment

07 TELEPHONE NO: 312/663-9415
08 DATE: 10 9 84 (MO. DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I IDENTIFICATION
01 STATE | 02 SITE NUMBER
WI | WID980610350

II WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)
X A SOLID
B POWDER, FINES
C SLUDGE
D OTHER
E SLURRY
X F LIQUID
G GAS

02 WASTE QUANTITY AT SITE
(Measures of waste quantities must be independent)
TONS
CUBIC YARDS ~135,000*
NO OF DRUMS

03 WASTE CHARACTERISTICS (Check all that apply)
A TOXIC
B CORROSIVE
C RADIOACTIVE
D PERSISTENT
X E SOLUBLE
F INFECTIOUS
G FLAMMABLE
H IGNITABLE
X I HIGHLY VOLATILE
J EXPLOSIVE
K REACTIVE
L INCOMPATIBLE
M NOT APPLICABLE

III WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 QUANTITY AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	~135,000	cu yds	*See Note Below
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

*Note: This amount represents total volume of waste disposed in fill over its 14 year existence. No records exist for individual waste quantities disposed.

Industrial wastes disposed include:
(1) Wood Products - paper, boxes, scrap wood.
(2) Kalo Dust - a mixture of lime and cement. (Allegedly this waste contained asbestos, but Mr. Dion denied this)
(3) Varnish & Thinner - Unknown constituents and characteristics.
(4) Glue Wastes - U Urea blend (Urea formaldehyde hydr), and melamine.

Mr. Dion stated that liquid wastes were burned elsewhere; but file indicates some liquids brought to site.

V FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	N/A		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Interview with site representatives during site inspection, 8-14-84.

File information from Wisc. Dept. of Natural Resources, Madison, and Green Bay Offices.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
WI | WID980616360

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION | 02 [ ] OBSERVED (DATE 8-15-84) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~18 / 1 mile | 04 NARRATIVE DESCRIPTION
F.I.T. sampled four monitoring wells on-site. Analyses show the groundwater downgradient to be degraded. Arsenic (15 ppb), Cadmium (2.4 ppb), copper (7.3 ppb), 1,1,2,2-tetrachloroethane (2.7 ppb), Trichloroethene (6.2 ppb), benzene (3.9 ppb), and xylenes (15 ppb) were all found.

01 [ ] B. SURFACE WATER CONTAMINATION | 02 [ ] OBSERVED (DATE) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED | 04 NARRATIVE DESCRIPTION
Not applicable.

01 [ ] C. CONTAMINATION OF AIR | 02 [ ] OBSERVED (DATE) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED | 04 NARRATIVE DESCRIPTION
Not applicable.

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS | 02 [ ] OBSERVED (DATE) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED | 04 NARRATIVE DESCRIPTION
Not applicable

01 [ ] E. DIRECT CONTACT | 02 [ ] OBSERVED (DATE) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED | 04 NARRATIVE DESCRIPTION
Not applicable; wastes are covered appropriately.

01 [X] F. CONTAMINATION OF SOIL | 02 [ ] OBSERVED (DATE) | [X] POTENTIAL | [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: ~35 acres. (Acres) | 04 NARRATIVE DESCRIPTION
Wastes were dumped in an "area fill" operation. No liner was established prior to dumping. Soils are sand/gravel with lenses of clay or hardpan. Groundwater is known to be degraded.

01 [X] G. DRINKING WATER CONTAMINATION | 02 [ ] OBSERVED (DATE) | [X] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~18 / 1 mile | 04 NARRATIVE DESCRIPTION
Site is near City of Algoma which provides municipal water to most of the residents. There are homes within 1 mile which have private wells. Since the soils are very permeable and the groundwater is known to be affected, there is a slight potential for residential water

01 [ ] H. WORKER EXPOSURE/INJURY | 02 [ ] OBSERVED (DATE) | [ ] POTENTIAL | [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED | 04 NARRATIVE DESCRIPTION
None reported.

01 [X] I. POPULATION EXPOSURE/INJURY | 02 [ ] OBSERVED (DATE) | [X] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~180 / 1 mile | 04 NARRATIVE DESCRIPTION
residential
There is a slight potential for nearby wells to be affected by the degraded groundwater from the landfill. If this occurs, there is a potential for the population to be exposed to contaminants leaking into the groundwater.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: UT | 02 SITE NUMBER: UTD980[illegible]

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE ____) ☐ POTENTIAL ☐ ALLEGED

None observed, or reported.

01 ☐ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE ____) ☐ POTENTIAL ☐ ALLEGED

None observed, or reported.

01 ☐ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE ____) ☐ POTENTIAL ☐ ALLEGED

None reported

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES
02 ☒ OBSERVED (DATE 8-15-84) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED ~1 mi / 1 mile
04 NARRATIVE DESCRIPTION
The groundwater has been affected. (See 'A. Groundwater Contamination') Thus, unstable containment of the wastes led to [illegible]

01 ☐ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE ____) ☐ POTENTIAL ☐ ALLEGED

None reported.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE ____) ☐ POTENTIAL ☐ ALLEGED

Not applicable; site is in rural area.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE ____) ☐ POTENTIAL ☐ ALLEGED

Not applicable

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: ~180 / 1 mile

IV. COMMENTS

Site reportedly was in an old quarry. Site owner/operator denies this. But he stated that he did quarry next to the filling area. Currently, a large sand & gravel quarry operates near the old landfill.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis reports.)

Interview with site representatives and personnel. observations made during site inspection, 8-14-84.

SEPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION
01 STATE: WI | 02 SITE NUMBER: WID980641038

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Enter all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☒ G. STATE (Specify)	00179	1982	1984	Wis. Solid Waste License
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE / DISPOSAL (Enter all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	135,000	cu. yds.
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Enter all that apply)
- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify): None

05 OTHER
- ☐ A. BUILDINGS ON SITE: N/A

06 AREA OF SITE: 7.5 acres

07 COMMENTS
Site began in 1969 and was licensed by WDNR in January, 1970. The site accepted mostly municipal refuse from the City of Algoma, and the town of Ahnapee. It also took some quantity of industrial wastes. The exact quantity of each type of waste is unknown. But, total amount, based on estimated volume of landfill, is approximately 135,000 cubic yards.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (One entry only)
☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.
Site is in an area of highly permiable soils, with discontinuous layers of silt, hardpan, and/or clay. The site was unlined. Wastes were apparently dumped in bulk. Groundwater is known to be affected.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ☐ YES ☒ NO

02 COMMENTS
Wastes are covered with 2 ft. clay cap and 6 in. of topsoil. Site has gate, and natural barriers excluding general population.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Interview with site representatives during site inspection, 8-14-84
File documents from Wisc. Dept. of Natural Resources, Madison.

EPA FORM 2070-13 (7-81)

SEPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: WI | 02 SITE NUMBER: WID980605362

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check all that apply)

	SURFACE	WELL
COMMUNITY	A ☐	B ☒
NON-COMMUNITY	C ☐	D ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A ☐	B ☐	C ☐
D ☐	E ☐	F ☐

03 DISTANCE TO SITE
A ~3 miles (mi)
B ~1½ miles (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)
☐ A ONLY SOURCE FOR DRINKING ☒ B DRINKING (Other sources available) ☐ C COMMERCIAL, INDUSTRIAL, IRRIGATION ☐ D NOT CURRENTLY USABLE
COMMERCIAL, INDUSTRIAL IRRIGATION (Other sources available)

02 POPULATION SERVED BY GROUNDWATER ~18,000 people

03 DISTANCE TO NEAREST DRINKING WATER WELL ~½ mile (mi)

04 DEPTH TO AQUIFER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
~100 ft (ft)	East	~500 ft (ft)	500,000 gpd (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including depth, diameter, and aquifer they draw from)
City of Algoma has 4 municipal wells: 2 are 1300 ft. deep (drilled in 1965) and are set into sandstone; 2 are 800 ft. deep. There are many residential wells in the rural area surrounding the city. Nearby wells are >100 ft deep, but other wells are thought to be shallower

10 RECHARGE AREA
☒ YES ☐ NO
COMMENTS: The soils are permeable near the surface. Sand & gravel quarry nearby.

11 DISCHARGE AREA
☐ YES ☒ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)
☒ A RECREATIONAL (Designated) DRINKING WATER SOURCE ☐ B IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C COMMERCIAL, INDUSTRIAL ☐ D NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME	AFFECTED	DISTANCE TO SITE
Kaehny Lake	☐	~¾ mile (mi)
Lake Michigan	☐	~2.5 miles (mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A 175 (NO. OF PERSONS)	B 782 (NO. OF PERSONS)	C 5373 (NO. OF PERSONS)

02 DISTANCE TO NEAREST POPULATION
1200 ft (mi)

03 NUMBER OF SITES AND AREAS WITHIN TWO (2) MILES OF SITE
205

04 DISTANCE TO NEAREST OFF-SITE BUILDING
1200 ft (mi)

05 POPULATION WITHIN ONE (1) MILE OF SITE (Include a description of each type of population and its proximity to the site, such as whether it is rural, residential, agricultural, commercial, industrial, etc.)
Site is in a sparsely populated rural area southwest of Algoma, WI.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
STATE: WI | NUMBER: WID980610382

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE

☐ A 10^{-6} – 10^{-8} cm/sec ☐ B 10^{-4} – 10^{-6} cm/sec ☒ C 10^{-4} – 10^{-3} cm/sec ☐ D GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK

☐ A VERY LOW ☐ B RELATIVELY LOW ☒ C RELATIVELY HIGH ☐ D VERY HIGH

03 DEPTH TO AQUIFER	04 NET PRECIPITATION	05 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	06 FLOOD POTENTIAL
~120 ft. (in)	~1 in. (in)	~5%	North	SITE IS IN 10 YR FLOODPLAIN

07 DISTANCE TO WETLANDS (5 ACRE MIN)

ESTUARINE	OTHER
A N/A (mi)	B ~3/4 mile (mi)

08 NEAREST OF ISOLATED POPULATION: N/A

09 DISTANCE TO CRITICAL HABITAT (OF ENDANGERED SPECIES)

_____ (mi)

ENDANGERED SPECIES: UNKNOWN

10 SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

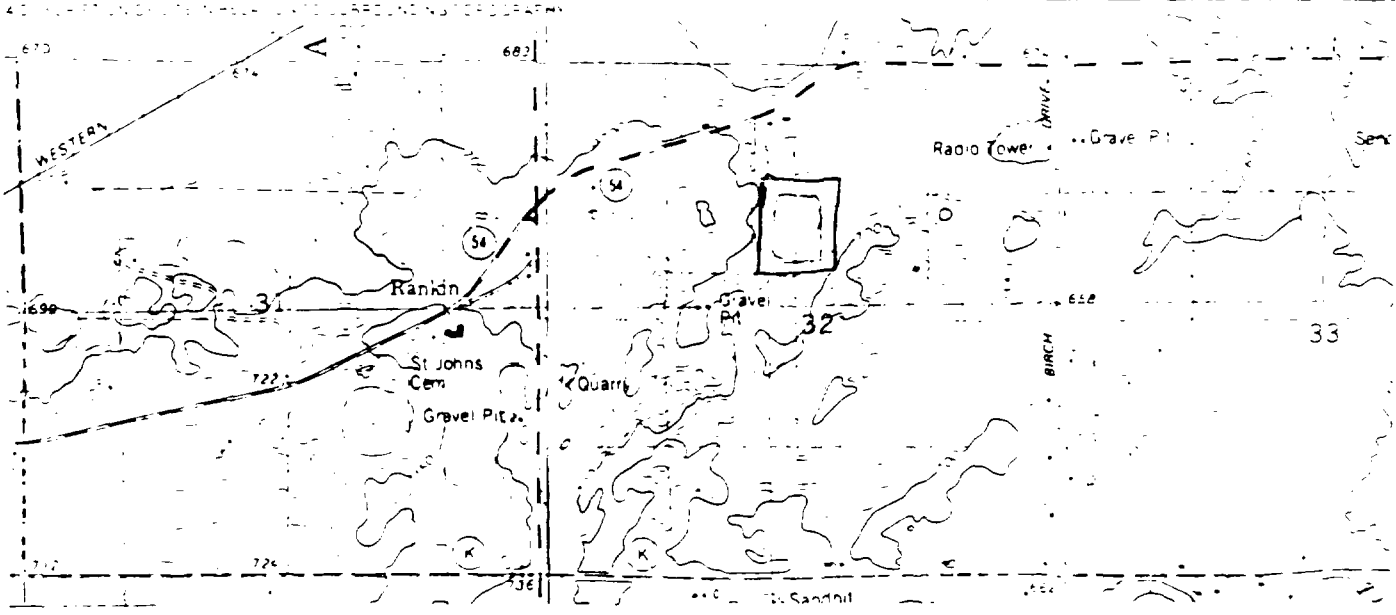
N/A

11 POPULATION WITHIN 1 MILE OF SITE

12 DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS; FORESTS; WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A ~1/2 mile (mi)	B ~1/2 (mi)	C _____ (mi)	D ~1/2 mile (mi)

13 DESCRIBE THE NATURE OF THE WASTE AND POTENTIAL HAZARDOUS SUBSTANCES



VII. SOURCES OF INFORMATION

File documents from Wisc. Dept. of Natural Resources, Madison Office.
USGS Topographic Map, ~~Algoma~~ and Casco Quadrangles, 7.5 minute series.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
WI	WID980614578

II. SAMPLES TAKEN By FIT

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	5	Organics to C.L.P. South Rickard Inorganics to Versar	Attached
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
None	

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☐ AERIAL N/A

02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Files of Ecology & Environment, Chicago; WDNR, Green Bay

V. OTHER FIELD DATA COLLECTED (Give brief narrative description)

Water level measurements and well depths of sampled wells are as follows:

CW-2: Depth to water = 3.6 ft ; Depth of well = 30.0 ft

CW-4: Depth to water = 5.3 ft ; Depth of well = 26.7 ft.

CW-6: Depth to water = 21.5 ft ; Depth of well = 36.7 ft.

OW-9: Depth to water = 25.9 ft ; Depth of well = 67.9 ft.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel observations made by FIT during inspection, 9-14-84

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
WI	WID980610336

II CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
City of Algoma	N/A

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
416 Fremont St.	N/A

05 CITY	06 STATE	07 ZIP CODE
Algoma	WI	54201

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER
None	

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER
Unknown if any	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER
Dunman Realty	N/A

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
927 Lake St.	N/A

05 CITY	06 STATE	07 ZIP CODE
Algoma	WI	54201

01 NAME	02 D+B NUMBER
Krohn	N/A

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
Unknown	N/A

05 CITY	06 STATE	07 ZIP CODE
Algoma	WI	54201

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Interview with site representatives during site inspection 8-14-84.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: WI | 02 SITE NUMBER: WID980610360

II. CURRENT OPERATOR

01 NAME: None	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): (Site is inactive)	04 SIC CODE:
05 CITY:	06 STATE: 07 ZIP CODE:
08 YEARS OF OPERATION:	09 NAME OF OWNER:

OPERATOR'S PARENT COMPANY

10 NAME: N/A	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE: 16 ZIP CODE:

III. PREVIOUS OPERATOR(S)

01 NAME: City of Algoma	02 D+B NUMBER: N/A
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 416 Fremont St.	04 SIC CODE: N/A
05 CITY: Algoma	06 STATE: WI 07 ZIP CODE: 54201
08 YEARS OF OPERATION: 69-83	09 NAME OF OWNER DURING THIS PERIOD: City of Algoma

PREVIOUS OPERATORS' PARENT COMPANIES

10 NAME: N/A	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE: 16 ZIP CODE:

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE: 07 ZIP CODE:
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE: 16 ZIP CODE:

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE: 07 ZIP CODE:
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE: 16 ZIP CODE:

IV. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Interview with site representatives during site inspection, 8-14-84

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
WI	WID980610380

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
None	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Calumet Co., Inc.	Unknown	Plumer Woodworks	Unknown
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
340 N Water St.	Unknown	1107 Perry St.	Unknown
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
Algoma / WI / 54201		Algoma / WI / 54201	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Algoma Industrial	Unknown	* Sic below	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
Unknown	Unknown		
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
Algoma / WI / 54201			

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
City of Algoma	None	Calumet Co., Inc.	unknown
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
City Garage, 1520 Jefferson	None	340 N. Water St.	Unknown
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
Algoma / WI / 54201		Algoma / WI / 54201	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Plumer Woodworks	Unknown	* See below	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1107 Perry St.	Unknown		
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
Algoma / WI / 54201			

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

* Other off-site generators contributed wastes to the landfill: One other business, U.S. Plywood; and local residents. Site was open for public use 4 days per week. These additional generators transported their own wastes.

Sources of Information:

(1) Interview with site representatives during inspection, 8-14-84.

(2) File documents from Wisconsin Dept. of Natural Resources, Madison office.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: WI | 02 SITE NUMBER: WID980610360

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED | 02 DATE | 03 AGENCY
04 DESCRIPTION
Not Applicable (N/A)

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ D. SPILLED WASTE REMOVED | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ E. CONTAMINATED SOIL REMOVED | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ F. WASTE REPACKAGED | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ G. WASTE DISPOSED ELSEWHERE | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ H. ON-SITE BURIAL | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ I. IN-SITU CHEMICAL TREATMENT | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ J. IN-SITU BIOLOGICAL TREATMENT | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ K. IN-SITU PHYSICAL TREATMENT | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ L. ENCAPSULATION | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ M. EMERGENCY WASTE TREATMENT | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ N. CUTOFF WALLS | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ P. CUTOFF TRENCHES/SUMP | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

01 ☐ Q. SUBSURFACE CUTOFF WALL | 02 DATE | 03 AGENCY
04 DESCRIPTION
N/A

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
WI WID980610380

II. PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
Not Applicable (N/A)

01 ☐ S. CAPPING/COVERING
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ T. BUILDING DAMAGE REPAIRED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ V. BOTTOM SEALED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ W. GAS CONTROL
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ X. FIRE CONTROL
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Y. LEACHATE TREATMENT
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Z. AREA EVACUATED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 2. POPULATION RELOCATED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 3. OTHER POTENTIAL ACTIVITIES
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis reports)

Interview with site representatives during inspection, 8-14-84.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE | 02 SITE NUMBER

WI | WID980610380

II ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY ENFORCEMENT ACTION

III SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Interview with site representatives during inspection, 8-14-94.

EPA FORM 2070-13 (7-81)

Report on the Investigation of the
Public Water Supply System
at
Algoma, Wisconsin

The following report describes an investigation of the public water supply system at Algoma, Wisconsin, in northeastern Kewaunee County. This investigation was performed on October 5, 1983, by Department personnel as part of a series of routine investigations of public water systems throughout the state.

General Description and History of the Water System

The municipal water system consists of 3 active wells, 1 standby well, 2 elevated storage reservoirs, one ground storage reservoir with repumping facilities and approximately 21.4 miles of distribution mains. The municipal water supply is treated by aeration at one well and by sequestering with polyphosphates, softening, and chlorination at all 3 supply wells. The facilities are operated by the Algoma Utility Commission under the supervision of Roland LeCleux, Certified Waterworks Operator. The water system serves a population of 3856, according to the 1980 census.

Well #1 - The first City well was constructed in 1912 to replace a dug well, which had replaced Lake Michigan as the supply source. The well is drilled to a total depth of 1334 feet with a 6 inch casing to the 160 foot depth. A submersible pump supplies water to a tray aerator adjacent to the pumphouse. From the aerator the water flows to a buried pre-softening basin.

Well #2 - The second well was added to the system in 1939. This well consists of a 20 inch outer casing to 36 feet and a 12 inch inner casing to 158 feet with an open drill hole to 1305 feet. A Peerless vertical turbine pump supplies water to the tray aerator described above. This well is maintained for standby purposes only, because the water pumped is somewhat turbid.

Well #3 - This well was drilled in 1960 to a total depth of 504 feet. The well consists of a 20 inch outer casing to 58 feet and a 16 inch inner casing to 151" with the remainder an open drill hole. A Layne vertical turbine pump discharges through a softener unit and then into the distribution system. A gas engine is provided to drive the pump in case of a power outage.

Well #4 - Well #4 was drilled on 1969, however because this well failed to produce an adequate supply of good quality water it was abandoned and never added to the system.

Well #5 - The City's newest well was drilled in 1974. This well consists of a 16 inch outer casing to 57 feet, a 12 inch inner casing to 150 feet with an open drill hole to a total depth of 472 feet. A Byron-Jackson vertical turbine pump discharges through a softener unit into the distribution system. A gas engine is also provided at this station.

Treatment - As mentioned previously, the water from Wells #1 and #2 passes through a tray aerator which was provided to remove odors. The aerator discharge flows to a buried 66,000 gallon pre-softening reservoir. From this reservoir the water is pumped through a pair of Zeolite softeners. Water from Wells #3 and #5 is pumped through the softeners by the well pumps. Permutit softeners are provided for Well #1, #2 and #3 while a Graver softener is provided at Well #5. These softeners operate automatically, with the backwash wastes discharged to the City's sanitary sewer system. Approximately 25% of the raw water bypasses the softeners at each supply station.

Chemical Addition - A polyphosphate (Treatment 932) and chlorine are added to the water at each supply station. The former is added to keep the soluble iron from settling out and causing "red water" problems. The chlorine is added as a disinfectant. The polyphosphate solution is fed into the water supply prior to the softeners by diaphragm pumps manufactured by Precision Controls. Gaseous Chlorine is added after the softners by V-notch type feeders manufactured by Advance. The chemical feed installations are essentially the same at each supply station.

Storage - The water from Wells #1 and #2 is discharged into a groundwater storage reservoir following softening. This poured concrete structure is entirely underground with a capacity of 300,000 gallons. From this reservoir the water is pumped into the distribution system either by one of two electric driven pumps or a gas engine driven pump.

Two elevated storage reservoirs have been provided. The older water tower, constructed in 1923, has a capacity of 100,000 gallons. The newer water tower, completed in 1981, provided a additional 300,000 gallons. Both towers appeared to be in good physical condition.

Distribution System - The distribution system consists of 112,943 feet of cast iron mains ranging in size from 4 to 10 inches. Approximately 13% of the distribution system consists of mains less than 6 inches in diameter. Generally, such mains do not provide adequate fire flows. Mr. LeClaux has reported that the Utility Commission is working to replace these mains as street are repaired and also to provide additional system looping. A current system map is available.

Discussion

The physical facilities described above were generally in very good condition, indicating good operation and maintenance. Generally, the structures and equipment comply with the applicable Administrative Codes. Two minor deficiencies were pointed out: the vent screen on the pre-softening reservoir needs replacement and some of the concrete on the tray aerator building needs patching.

Niagra Dolomite aquifer. Wells #1 and #2 penetrate this aquifer as well as the Richmond Shale, The Galena-Platteville Dolomite and into the St. Peter Sandstone.

The quality of the finished water is fairly good. Routine sampling has revealed that the water supply is in compliance with all health related standards. The raw water is very hard, has a high iron content and some hydrogen sulfide. The treatment and chemical addition described earlier help to control problems associated with these water quality parameters.

The Larglier Index reveals that the finished water has slightly corrosive characteristics. Samples of the finished water at Wells #1 and #5 were collected during this survey to re-evaluate the corrosive nature of the water. The analytical results and their interpretation will be transmitted when the analysis is completed.

The City has an active program for detecting and eliminating cross-connections to the municipal water supply. This program consists of plumbing inspections at the time the water meter is pulled for service for residential customers. Industrial customers are inspected on the basis of health hazards associated with their water use activities.

The Algoma Waterworks is required to submit 4 samples per month from the distribution system for bacteriological analysis. Generally, the waterworks is excellent in their sample submission, though mailing problems have occurred, resulting in slightly less than 100% compliance. All samples submitted for the past 5 years have been bacteriologically safe. The monthly operating reports are regularly submitted in a timely manner.

Conclusions and Recommendations

Based upon this investigation and a review of available records, it is concluded that the Algoma public water supply system is excellently operated and maintained. The municipal water system is capable of supplying an adequate quantity of good quality water to City residents and establishments. Water utility personnel deserve commendation for their efforts in the upkeep of the system. The following recommendations are made to improve the overall water system:

1. The vent screen on the pre-softening basin shall be replaced.

2. The concrete on the tray aerator structure shall be resealed or repaired.

3. The City should continue their efforts to upgrade the distribution system by replacing 4 inch mains and providing additional "looping".

LANDFILL INSPECTION AND SURVEILLANCE FORM

Sec 32, T25N, R25E

City Algoma — Name of Entity

TN Ahnapee — Location

Kewaunee — County

00179 — License Number

10:45 — Time

10/26/83 — Date

Terry Hegeman — Inspector's Signature

Copy sent to entity (?) Yes X
or
Handed No ____

Noted by District

	Site Evaluation	Yes	No	N
1.	Is gate in accordance with NR 180.13?			
2.	Is attendant in accordance with NR 180.13?			
3.	Are insects and rodents under control?			
4.	Is windblown material handled properly?			
5.	Is the active area confined?			
6.	Are all weather roads provided?			
7.	Does C & C appear adequate?			
8.	Is surface water effectively diverted around site?			
9.	Is on-site drainage acceptable?			
10.	Was leachate absent or under control?			
11.	Were unauthorized wastes absent?			
12.	Was open burning in accordance with NR 180.13?			
13.	Are adequate firebreaks in existence?			
14.	Is the site operating in conformance with plans and approvals?			
15.	Were any of the monitoring wells made inoperative?			

COMMENTS:

Site has been covered, graded, topsoiled & seeded
work looks excellent although its doubtful that the
seed will germinate this year

RECOMMENDATIONS:

* NA means not applicable
* C & C means cover and compaction

LANDFILL INSPECTION AND SURVEILLANCE FORM

Name of Entity _____ Location _____

County _____ License Number _____

Time _____ Date _____ Inspector's Signature _____

Copy sent to entity (?) Yes____
or
Handed No ____ JAN 0 6 1995 Noted by District

Site Evaluation	Yes	No
1. Is gate in accordance with NR 180.13?		
2. Is attendant in accordance with NR 180.13?		
3. Are insects and rodents under control?		
4. Is windblown material handled properly?		
5. Is the active area confined?		
6. Are all weather roads provided?		
7. Does C & C appear adequate?		
8. Is surface water effectively diverted around site?		
9. Is on-site drainage acceptable?		
10. Was leachate absent or under control?		
11. Were unauthorized wastes absent?		
12. Was open burning in accordance with NR 180.13?		
13. Are adequate firebreaks in existence?		
14. Is the site operating in conformance with plans and approvals?		
15. Were any of the monitoring wells made inoperative?		

COMMENTS:

RECOMMENDATIONS:

* NA means not applicable
* C & C means cover and compaction

LANDFILL INSPECTION AND SURVEILLANCE FORM

City Algoma
Name of Entity

Tri Almagee
Location

Kewaunee
County

0179
License Number

9:05 a.m.
Time

5/23/03
Date

Tim Hagerman
Inspector's Signature

Copy sent to entity (?) Yes X
or
Mailed No ____

Notify District

RECEIVED 1993

Site Evaluation		Yes	No
1.	Is gate in accordance with NR 180.13?	X	
2.	Is attendant in accordance with NR 180.13?	X	
3.	Are insects and rodents under control?	X	
4.	Is windblown material handled properly?	X	
5.	Is the active area confined?	X	
6.	Are all weather roads provided?	X	
7.	Does C & C appear adequate?	X	
8.	Is surface water effectively diverted around site?	X	
9.	Is on-site drainage acceptable?	X	
10.	Was leachate absent or under control?		X
11.	Were unauthorized wastes absent?		X
12.	Was open burning in accordance with NR 180.13?	X	
13.	Are adequate firebreaks in existence?		
14.	Is the site operating in conformance with plans and approvals?		
15.	Were any of the monitoring wells found inoperative?		X

COMMENTS:
- Several small leachate seeps along east side of site.
- Seeps in SW corner have been capped with clay & do not flow.
- Large area of site (95%) is at final grade & has been capped with clay. No topsoil has been applied over it yet.

RECOMMENDATIONS:

* NA means not applicable
* C & C means cover and compaction

City Wisconsin
Name of Entity

Tri Airport
Location

Kewaunee
County

0179
License Number

1:30
Time

4/20/83
Date

Tony Wegner
Inspector's Signature

Copy sent to entity (?) Yes X
or
Handed No ____

Note by District

1983

Site Evaluation	Yes	No
1. Is gate in accordance with NR 180.13?	X	
2. Is attendant in accordance with NR 180.13?	X	
3. Are insects and rodents under control?	X	
4. Is windblown material handled properly?	X	
5. Is the active area confined?	X	
6. Are all weather roads provided?	X	
7. Does C & C appear adequate?	X	
8. Is surface water effectively diverted around site?	X	
9. Is on-site drainage acceptable?	X	
10. Was leachate absent or under control?		X
11. Were unauthorized wastes absent?	X	
12. Was open burning in accordance with NR 180.13?	X	
13. Are adequate firebreaks in existence?		
14. Is the site operating in conformance with plans and approvals?		
15. Were any of the monitoring wells made inoperative?		X

COMMENTS:
Large number of leachate seeps in SW corner and along Wedge of site
Slopes on south edge of fill are are too steep. Maximum allowed are 3:1

RECOMMENDATIONS:

* NA means not applicable
* C & C means cover and compaction

LANDFILL INSPECTION AND SURVEILLANCE FORM

City Algoma — Name of Entity
Wilshnagee Sec. 32 — Location
Kewaunee — County
00179 — License Number
1:35 — Time
9/22/81 — Date
Terry Hoeman — Inspector's Signature

Copy (Sent) or Handed to entity (?) Yes X No ____

Noted by District

Site Evaluation	Yes	No
1. Is gate in accordance with NR 180.13?	X	
2. Is attencant in accordance with NR 180.13?	X	
3. Are insects and rodents under control?	X	
4. Is windblown material handled properly?	X	
5. Is the active area confined?	X	
6. Are all weather roads provided?	X	
7. Does C & C appear adequate?	X	
8. Is surface water effectively diverted around site?	X	
9. Is on-site drainage acceptable?		X
10. Was leachate absent or under control?	X	
11. Were unauthorized wastes absent?	X	
12. Was open burning in accordance with NR 180.13?	X	
13. Are adequate firebreaks in existence?		
14. Is the site operating in conformance with plans and approvals?		
15. Were any of the monitoring wells made inoperative?		X

COMMENTS:
poor drainage off of filled areas results in ponding of runoff. this will filter into garbage & produce leachate

RECOMMENDATIONS:
improve drainage. pick up paper

* NA means not applicable
* C & C means cover and compaction

LANDFILL INSPECTION AND SURVEILLANCE FORM

SITE NAME Algoma Landfill
SITE ID 09CE0380
REFERENCE 20

City Algoma DNR — TN Algoma
Name of Entity — Location

Kewaunee — 00179
County — License Number

11:45 — 8/31/81 — Terry Hegeman
Time — Date — Inspector's Signature

Copy (Sent) or Handed to entity (?) Yes X No ____

Noted by District

Site Evaluation	Yes	No
1. Is gate in accordance with NR 180.13?	X	
2. Is attendant in accordance with NR 180.13?	X	
3. Are insects and rodents under control?	X	
4. Is windblown material handled properly?		X
5. Is the active area confined?	X	
6. Are all weather roads provided?	X	
7. Does C & C appear adequate?	X	
8. Is surface water effectively diverted around site?	X	
9. Is on-site drainage acceptable?		X
10. Was leachate absent or under control?	X	
11. Were unauthorized wastes absent?	X	
12. Was open burning in accordance with NR 180.13?	X	
13. Are adequate firebreaks in existence?		
14. Is the site operating in conformance with plans and approvals?		
15. Were any of the monitoring wells made inoperative?		

COMMENTS:
water ponded on top of fill/area in middle of site may be above grade - keep close eye on it so it doesn't get out of hand
Covering could be improved

RECOMMENDATIONS:

* NA means not applicable
* C & C means cover and compaction