4L78C

July 13, 1990

EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations
1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

WELL REPLACEMENT AND DEVELOPMENT REPORT

Landfill Site, Witmer Road

Town of Niagara

for

SKW ALLOYS

INTRODUCTION:

The purpose of this report is to describe the well procedures and findings on the newly installed replacement well at the SKW Alloy facility. Monitoring well #5R had been obliterated during excavation and/or filling procedures around the site. Replacement of old well #5R was requested by Dick Snyder of SNYDER ENGINEERING.

FINDINGS:

The soil sequence described at this new location was very similar to the old profile at MW #5R. Soil fill to a depth of 8.0 feet was placed on clayey to coarse silty lake sediment to 12.0 feet. A 4.5 foot thick water sorted and deposited sand layer was encountered to a depth of 16.5 feet to the contact boundary of the glacial till. The new well screen was positioned across this 4.5 foot saturated sand horizon immediately above the glacial till. This sand section appeared thicker at this location than at the original MW #5R.

DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments

WELL DEVELOPMENT:

The newly installed monitoring well #5R replacement was developed on May 15, 1990. A 1 1/2 inch stainless steel bailer was used for well development and steam cleaned prior to inserting into the well.

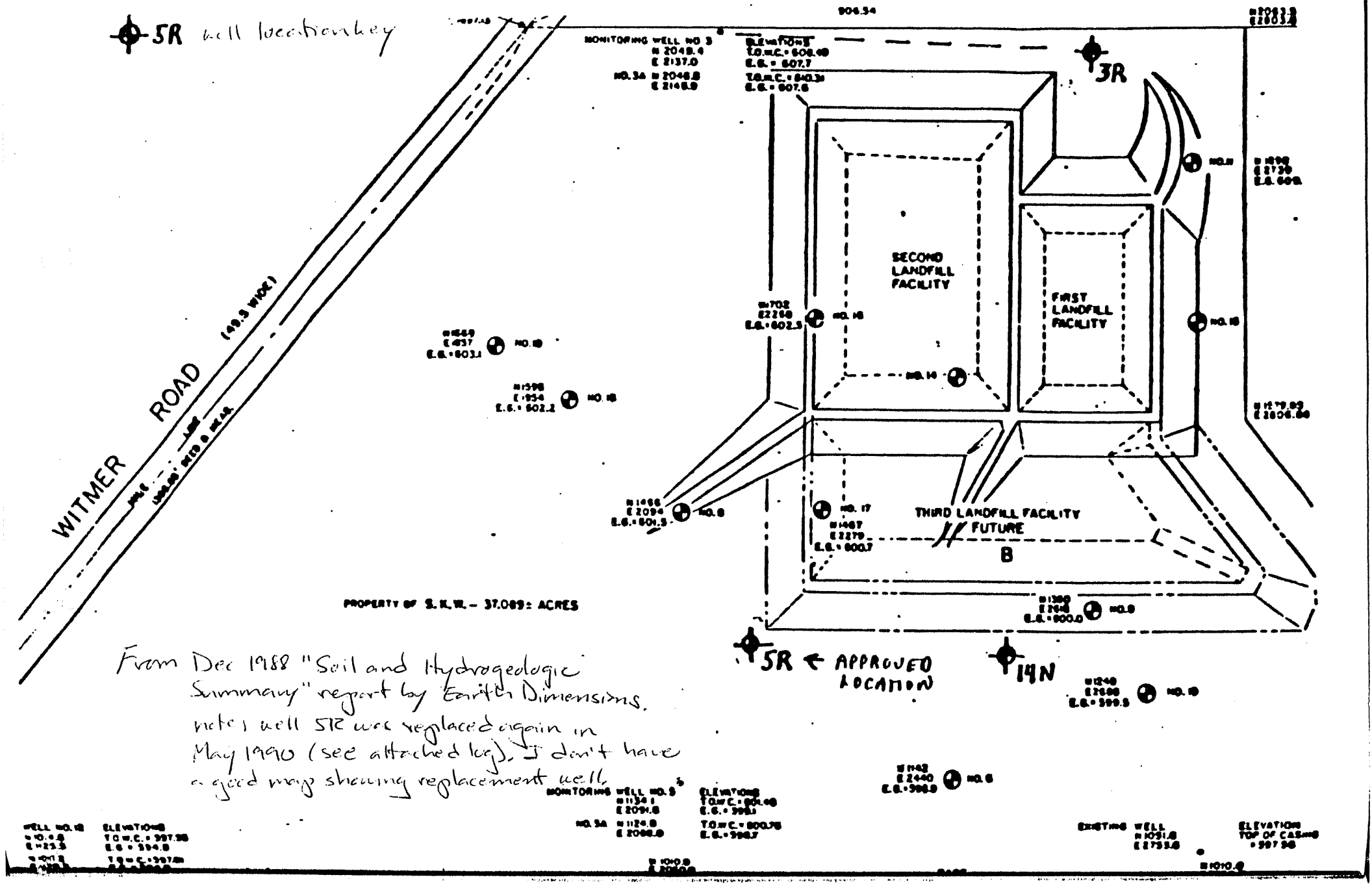
The static water level was recorded at 7.6 feet below ground surface. The volume of water in the well was calculated to be 1.6 gal/well volume. Three well volumes were then removed. The water extracted during development had a fairly high silt content with a distinct reddish brown color. Recharge to the well was slow due to the very fine size sandy soil and high silt content. Further development would be required to obtain silt-free water. No apparent odor or unusual signs of contamination were noticed. All water removed during development was disposed of by re-introducing it to the top of the landfill.

Prepared by,

Dale M. Gramza
Geologist

DMG/eal
4L78c

FIGURE 5 APPROXIMATE LOCATION OF RECENTLY INSTALLED WELLS



From Dec 1988 "Soil and Hydrogeologic Summary" report by Earth Dimensions. note: well 5R was replaced again in May 1990 (see attached log). I don't have a good map showing replacement well.

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

4L78 HOLE NO. 1 SURF. ELEV. _____

PROJECT Piezometer Installation
Airco Alloys - Niagara Falls
LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 12/15/78 COMPLETED 12/15/78

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	Well	WATER TABLE & REMARKS
							Moist whitish gray slag, variable size, loose	Bentonite Concrete	Industrial waste fill to 1.3 feet over clayey stone free lake sediment to 7.5 feet over dense loamy glacial till containing stone fragments to end of boring.
							1.3	1.0	
	1								
	2	13	10	16	27	26	Moist distinctly mottled reddish brown SILTY-CLAY with gray vertical desiccation cracks, extremely firm (stiff), plastic, sticky	Clay Cuttings	
							---------clear transition to--- 3.5	34	
5	3	16	20	24	29	44	Moist reddish brown SILTY-CLAY with ½ to 1½ inch extremely moist SILT lenses, non-silt lenses contains thinly laminated clays, sticky, plastic	Bentonite & Concrete	SILT lenses spaced about ½ foot apart.
							-------clear transition to----- 7.5	80	
	4	8	20	25	12	45	Moist reddish brown gravelly loam (SANDY-SILT) with 15 to 20% hard gray subrounded dolomitic gravel, very firm, nonplastic, nonsticky	Gravel	Well notes: 2 in. inside diameter PVC well with bottom 2 ft. slotted every ¼-½" installed with 3 ft. stickup above ground.
10									
	5	100/1"					11.1		
							Refusal encountered at 11.1 feet.		Water table 8 feet below surface at completion.
									Well installed to 11.1 feet below surface.
15									

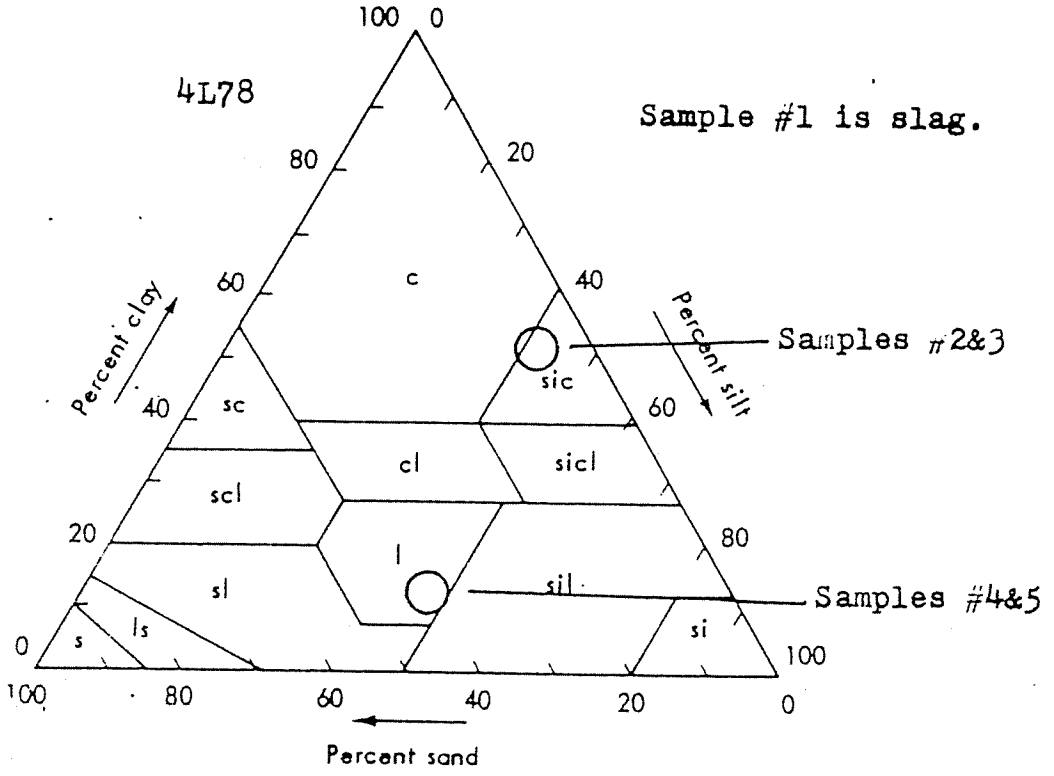
dew

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Owens & Smith SHEET 1 OF 1

24

HOLE #1:



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

4L78 HOLE NO. 2 SURF. ELEV. _____

PROJECT Piezometer Installation
Airco Alloys - Niagara Falls
LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 12/27/78 COMPLETED 12/27/78

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0-6 / 6-12 / 12-18 / 18-24	N	DESCRIPTION & CLASSIFICATION	Well	WATER TABLE & REMARKS
	1			Moist brownish gray and gray powdery slag fill		Fill material and disturbed soil to 4.5 feet over clayey lake sediments to 7.5 feet over water sorted stratified sediment to 12.1 feet over dense loamy glacial till to refusal.
				2.5		
	2	22 / 20 / 21	41	Moist brownish gray to gray disturbed silty clay loam (CLAYEY-SILT) with 2-3% fine dolomitic gravel fragments,		
	3	11 / 17 / 20	37	very firm, slightly plastic 4.5		
5				Moist highly mottled brownish gray SILTY-CLAY with fine size desiccation cracks, very firm, (stiff), plastic		
				7.5		
				Moist to extremely moist reddish, brown heavy silt loam (SAND-SILT-CLAY) with 5 to 15% fine subangular gravel, and gray densely packed SILT lenses, firm to friable, slightly plastic		
10	4	6 / 7 / 17	24			
		8 / 8 / 20	28			
	5	17	30			Sample #5 contains limestone rock fragments.
				------clear transition to------ 12.1		
				Extremely moist reddish gray heavy silt loam (CLAYEY-SILT) with 5 to 10% gravel, soft		
				14.5		
15				Refusal encountered at 14.5 feet		

Well notes: 2 in. inside diameter PVC well with bottom 2 ft. slotted every ¼-½" installed with 3 ft. stickup above ground.

Water table 7.5 ft. below surface at completion.

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

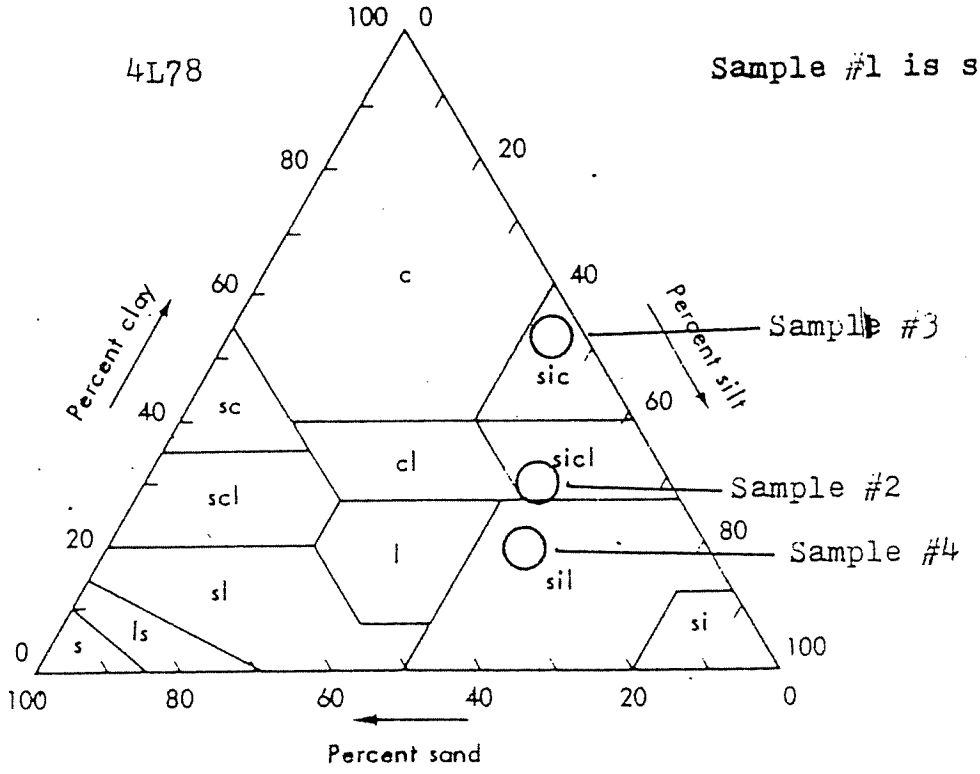
LOGGED BY Owens SHEET 1 OF 1

25

HOLE #2:

4L78

Sample #1 is slag.



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm) and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

4L78 HOLE NO. 3 SURF. ELEV. _____

PROJECT Piezometer Installation
Airco Alloys - Niagara Falls
LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 12/28/78 COMPLETED 12/28/78

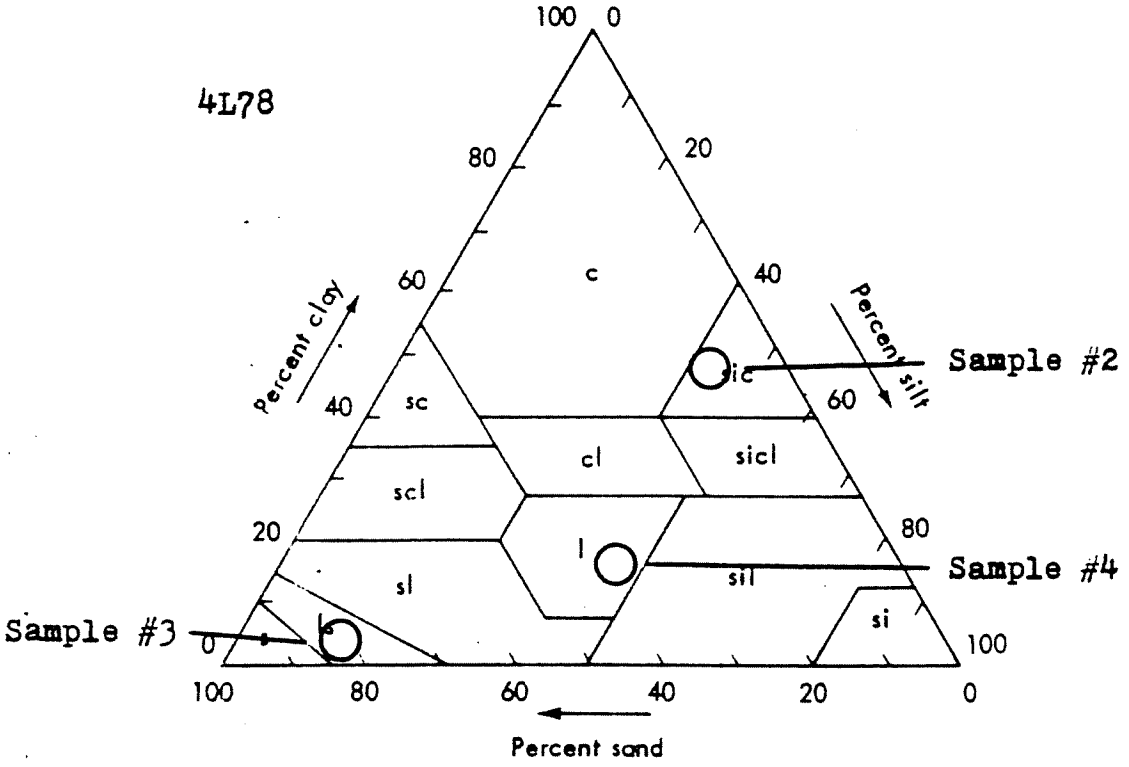
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	Well	WATER TABLE & REMARKS
	1	8	2				Moist brown mixed silty clay soil and slaggy fill material, loose but firm in place.	2 ft. slotted 1½ in. carbon steel pipe with bottom	Fill material to six feet over disturbed silty lake sediments to 8 ft. over very fine sands to 13 ft. over glacial till (hardpan) to refusal.
5		21	44	22		66	6.0	Bentonite & Concrete	Saturation of fill noted five feet below surface.
	2	16	10	23		33	Moist highly mottled grayish brown SILTY-CLAY with 2% fine gravel, firm, plastic 8.0		Noticeable auger resistance to 12 feet.
	3	35	45	56		101			Water 1 foot below surface at completion.
10							Extremely moist becoming wet faintly mottled reddish brown to brown very fine loamy sand (SAND), well sorted, nonplastic, very firm in place. 13.0	11.2	Well notes: 2 in. inside diameter carbon steel well with bottom 2 ft. slotted with 1 foot stickup above surface.
	4	62	85	100/2"			Extremely moist brown gravelly loam, (SAND-SILT-CLAY) with 15-20% subangular dolomitic gravel & occasional cobble/boulders, nonplastic, very firm in place, brittle. 15.2	Gravel	
15							Refusal encountered at 15.2 feet.		

dew

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Owens & Lenhardt SHEET 1 OF 1

HOLE #3:



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

4L78 HOLE NO. 4 SURF. ELEV. _____

PROJECT Piezometer Installation
~~Airco Alloys~~ - Niagara Falls
LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 12/29/78 COMPLETED 12/29/78

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER (0"/6" / 6"/12" / 12"/18" / 18"/24" / N)	DESCRIPTION & CLASSIFICATION	Well	WATER TABLE & REMARKS
		36 55 61 116	Moist light gray powdery fill with 25% fine slag fragments, very firm in place, nonplastic		Slaggy fill to 6 feet over silty lake sediments to 10 feet over gravelly glacial till to refusal.
	1				
			-------clear transition to------- 4.0		
5			Coarse slag fill		Pipe notes: 2 in. inside diameter PVC well with bottom two feet slotted every ¼-½ in. installed with 28 inches stickup above ground.
			6.0		
	2	11 13 17 30	Moist dark grayish brown silt loam (CLAYEY-SILT) topsoil, friable, slightly plastic		
			-----clear transition to--- 7.0		
		18 23 41	Moist reddish brown SILTY-CLAY with fine desiccation cracks, finely laminated clays, very firm, plastic		
	3		Shelby tube ~~sample taken~~		
10			10.0		
			Extremely moist becoming wet brown loam (SAND-SILT-CLAY) with 20% dolomitic gravel, soft, nonplastic		
		7 5 6 11			
	4				
				2 in. PVC pipe with bottom 2 ft. slotted	13.5
15				Gravel	Water at 15.0 feet at completion
				Bentonite & Concrete	
			16.7		
			Refusal at 16.7 feet		

dew

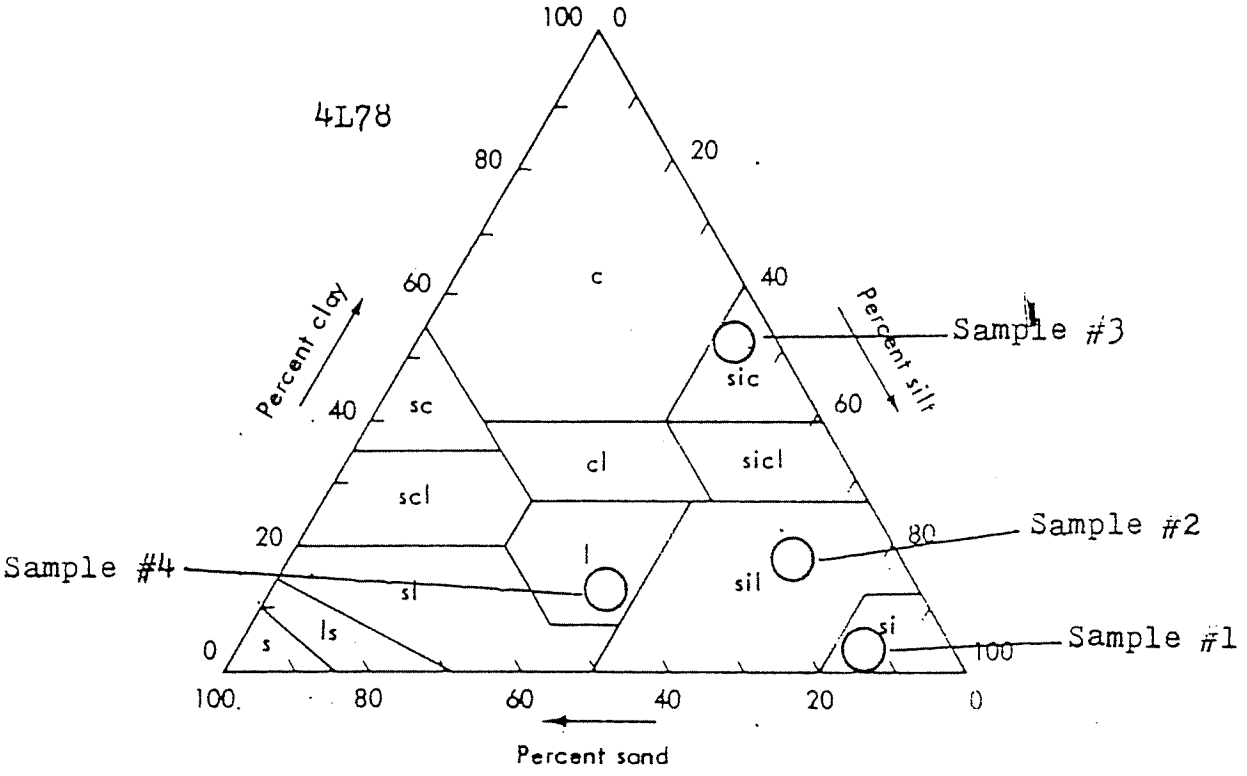
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Lenhardt & Pitt

SHEET 1 OF 1

27

HOLE #4:



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

4L78 HOLE NO. 5 SURF. ELEV. _____

PROJECT Piezometer Installation LOCATION See survey
Airco Alloys - Niagara Falls

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 12/29/78 COMPLETED 12/29/78

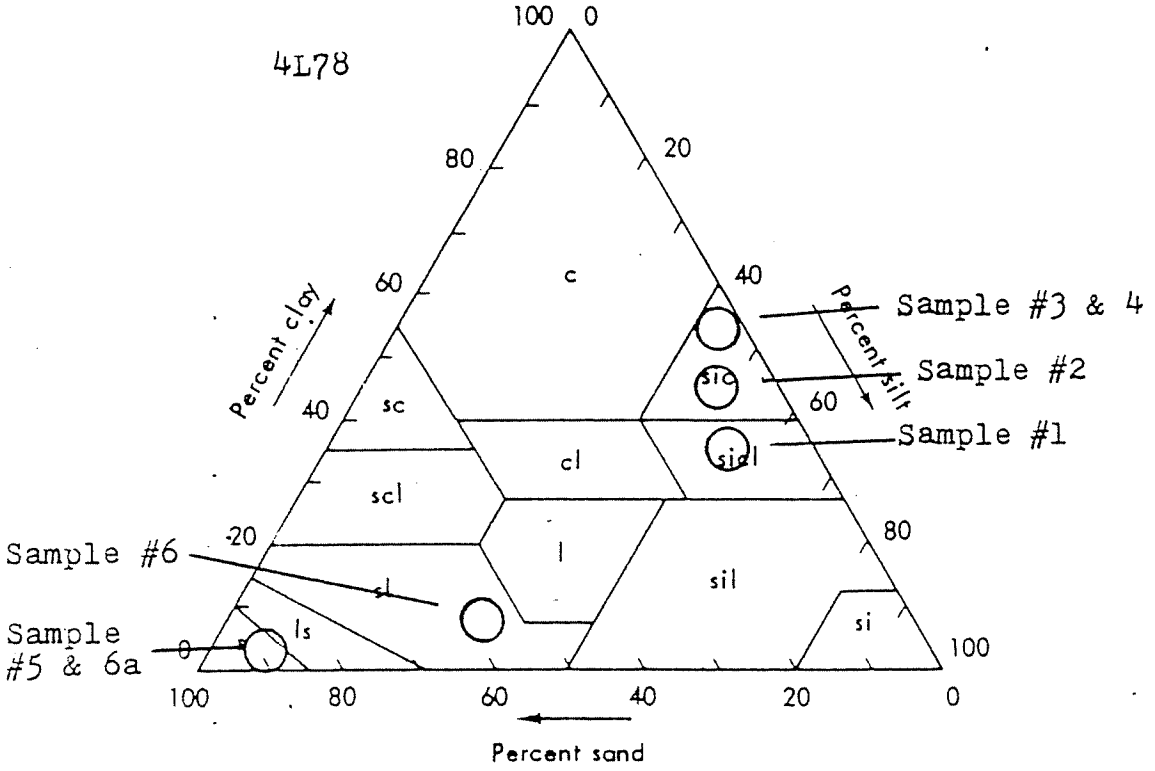
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	DESCRIPTION & CLASSIFICATION	Well	WATER TABLE & REMARKS
							Moist dark brown medium and coarse size slag fill	2 in. carbon steel with bottom 2 ft. slotted; Concrete & Bentonite	Slag fill to 2.5 feet over silty and clayey lake sediments to 13.5 feet over stratified sand to 20.5 feet over dense loamy glacial till to refusal.
	1	18	19	23		42	2.5		
							Moist dark grayish brown silty clay loam (CLAYEY-SILT) with 2-5% fine subangular gravel, wood fragments, friable but firm in place, disturbed		
	2	7	14	17		31			
5							Moist to extremely moist highly mottled grayish brown SILTY-CLAY with dessication cracks, firm, plastic		
							-------clear transition to------ 7.8		
28" feed 24.5" recovery									
10							Extremely moist reddish brown SILTY-CLAY with fine size silt lenses, finely laminated clays, firm, plastic, and cohesive		
	3	13	15			28			
	4	11	14	13		27	(Silt strata entered in Shelby tube)		
							13.5		
							Extremely moist brown stratified very fine sand (SAND), friable but very firm in place, nonplastic		
15	5	23	27	30		57			

Continued on pg. 2..

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Lenhardt & Pitt SHEET 1 OF 2

HOLE #5:



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

4L78 HOLE NO. 5 (continued) SURF. ELEV. _____

PROJECT Piezometer Installation
Airco Alloys - Niagara Falls
LOCATION See survey

CLIENT Secured Landfill Contractors, Inc DATE STARTED 12/29/78 COMPLETED 12/29/78

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	Well	WATER TABLE & REMARKS
							Stratified very fine sands	Bentonite & Concrete	
20	5	2	5	33	49	82			Sample #6 bridges contact with till
	6						20.5		20.8
							Extremely moist brown dense sandy loam (SILTY-SAND), very firm in place, brittle, non-plastic, 20 to 25% subangular dolomitic gravel	Gravel	Water 16 feet below surface at completion
							24.2		
25							Refusal at 24.2 feet		Well notes: 2 in. inside diameter carbon steel with bottom 2 feet slotted with 1½ foot stickup above ground

dew

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Lenhardt & Pitt

SHEET 2 OF 2

27

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 6 SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, N.Y.
~~Shelby tube soil sampling~~ LOCATION Approx. 135' from shifting building (see survey)

CLIENT ~~Secure Landfill Contractors, Inc.~~ DATE STARTED 6/8/79 COMPLETED 6/8/79

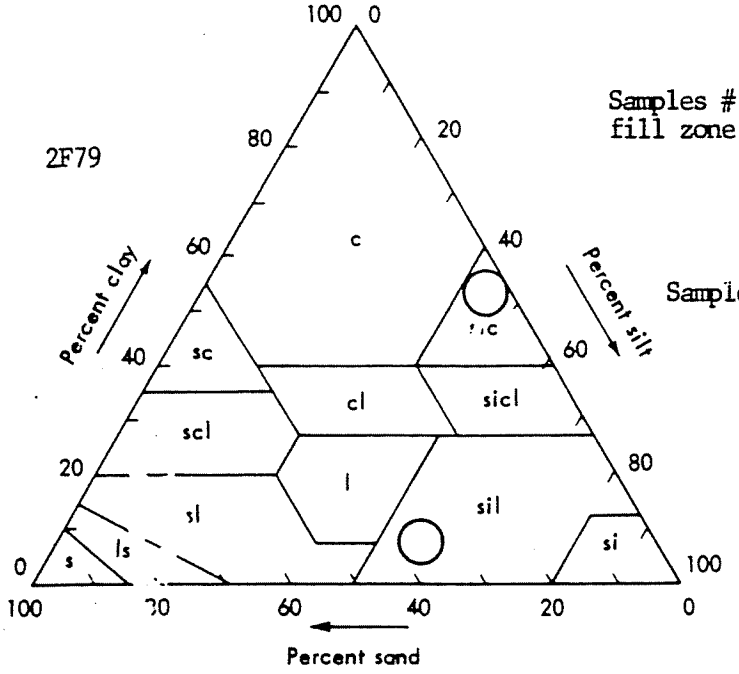
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	14	10	10		10	Moist to extremely moist blackish gray grading to a reddish brown heavy silt loam (CLAYEY-SILT) fill, with 15 to 20% slag fragments, firm in place.	Surface 2 inches of fill consisting of large size angular slag fragments. Fill to 8.5 feet over clayey lake sediments to 15.5 feet over coarse silty lake sediments to 20.5 feet over loamy glacial till to refusal.
5	2	3	3	3		3		
								8.5'
10	3	13	12	13		12	Moist faintly mottled reddish brown SILTY-CLAY with vertical gray desiccation cracks and gray silt lenses, very firm, sticky, plastic.	Shelby sample taken from 11.5 to 13.5 foot depths with full 24 inch recovery.
	SHELBY TUBE SOIL SAMPLE							
15	4	6	9	9		9	_ _ _ clear transition to _ _ _ _ Extremely moist reddish brown coarse silt loam (SANDY-SILT), stratified, nonplastic.	15.5'

Continued on page 2

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

djr LOGGED BY Steven J. Pitt, Soil Scientist

HOLE # 6



Samples #.1-2 were from the fill zone.

2F79

Sample #3

Sample #4

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. ~~6 cont.~~ SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, N.Y. ~~Shelby tube soil sampling~~ LOCATION Approx. 135' from shifting ~~building (see survey)~~

CLIENT Secure Landfill Contractors, Inc. DATE STARTED 6/8/79 COMPLETED 6/8/79

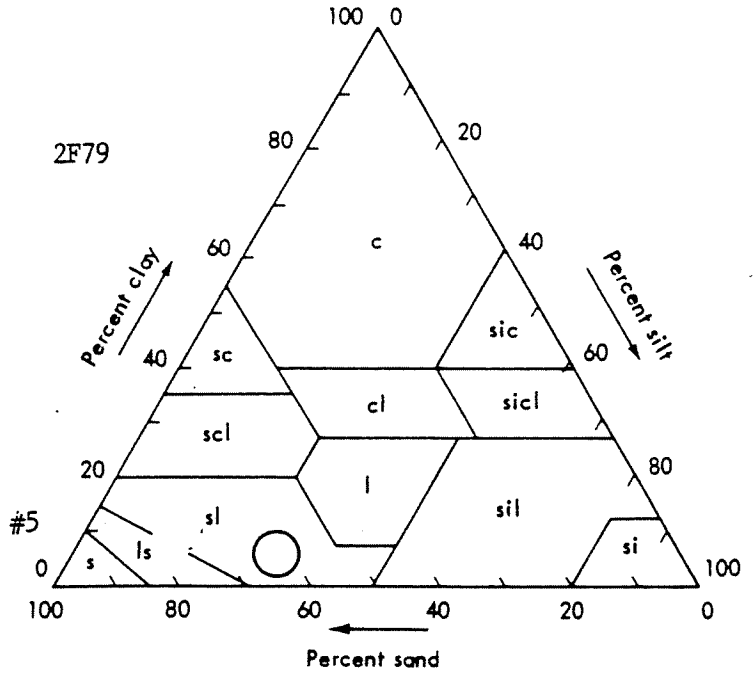
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
							Some as last horizon described on previous page.	
20	5	8	9	9		9		20.5'
							Extremely moist to wet reddish brown fine sandy loam (SILTY-SAND) with 10 to 15% subangular and subrounded dolometic gravel, firm in place, massive soil structure.	23.0'
25							Refusal at 23.0'	Water level 13 feet below surface at completion.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

djr

LOGGED BY Steven J. Pitt, Soil Scientist SHEET 2 OF 2

HOLE #6, CONT.



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951)

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 7 SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, N.Y. LOCATION See survey
Shelby tube sampling

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/8/79 COMPLETED 6/8/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
							Extremely moist becoming wet below 3 feet, blackish gray slag, concrete and flyash with occasional layers of extremely moist to wet heavy silt loam soil(CLAYEY-SILT), nonsoil very firm in place, loose when disturbed	High blow counts in the fill zone indicate stone being pushed by sampler. Fill to 9.0 feet over clayey lake sediment to 14.5 feet over silty glacial till to refusal.
	1	15	18	28		18		
5								
	2	41	24	18		24		
								9.0′
10								
	3	6	6	11		6	Moist distinctly mottled reddish brown (SILTY-CLAY) with vertical gray desiccation cracks and gray silt lenses, very firm, sticky, plastic	
	SHELBY TUBE SOIL SAMPLE							Shelby sample #7 taken from 11.5 to 12.6 feet with 14 inch recovery.
								14.5′
15								
	4	9	10	19		10	Extremely moist brown to reddish brown heavy silt loam (CLAYEY-SILT) with 10 to 15% subangular and subrounded dolomitic gravel fragments, massive, plastic and sticky	
18								18.0′
							Refusal at 18.0 feet	Water table 5 feet below surface at completion.

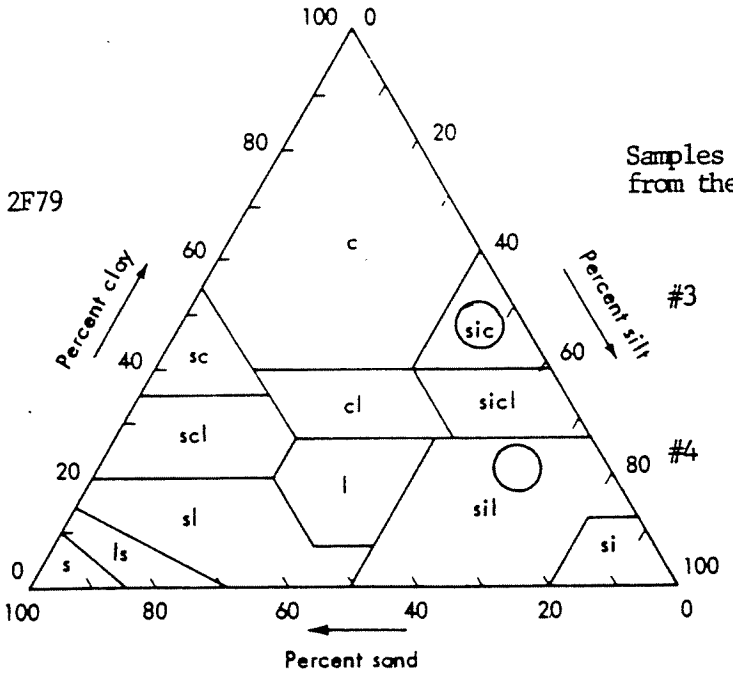
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

djr

LOGGED BY Steve J. Pitt, Soil Scientist SHEET 1 OF 1

HOLE #7

2F79



Samples #1 and #2 were from the fill zone.

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 8 SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, N.Y. LOCATION See survey
Shelby tube sampling

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/9/79 COMPLETED 6/9/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
							Moist black mixed wood chips, cinders and slag, loose	Nonsoil fill to 2.5 ft. over clayey and silty lake sediments becoming coarser textured with depth to 15.0 ft. over water sorted very fine sands to 21.0 ft. over loamy glacial till to refusal.
	1	13	25	40		65		
								2.5
							Moist reddish brown silty clay (CLAYEY-SILT) thinly laminated clays with gray silt lenses, extremely firm (stiff) plastic, sticky	
	SHELBY TUBE SAMPLE							
5								
	2	13	21	23		44	- - - - - grades downward to - - - - - -	5.0
							Moist reddish brown silty clay loam (CLAYEY-SILT) thinly lamianted silts and clays with occasional gray silt lens, firm, plastic, slightly sticky	
10								Shelby tube penetrated 2 ft. of CLAYEY-SILT between 3 and 5 foot depths with 11 in. of recovery.
	3	12	13	13		26		
15								
	4	8	7	7		14	- - - - - clear transition to - - - - -	15.0
							Wet pink loamy very fine sand (SAND), with coarse silt lenses, thinly bedded, firm in place	

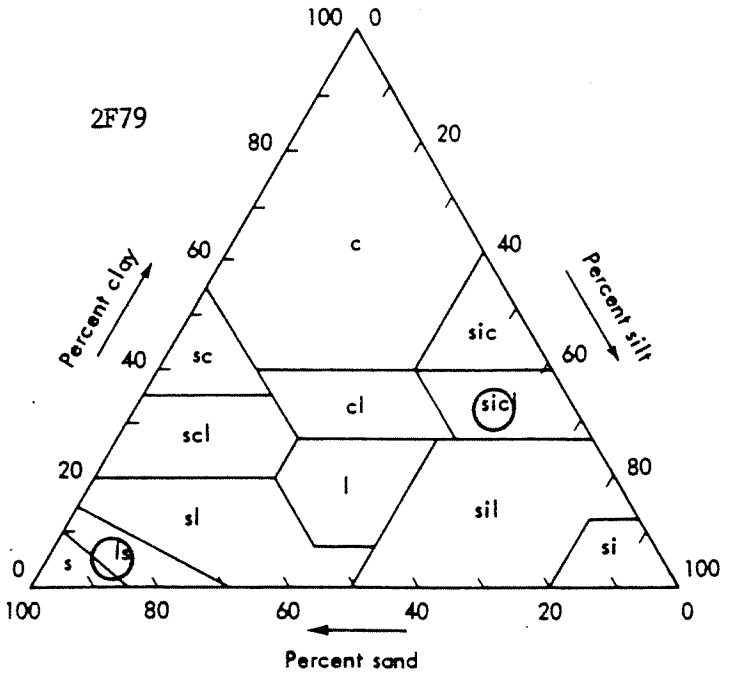
Continued on page #2 .....

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens, Soil Scientist SHEET 1 OF 2

HOLE #8

2F79



Sample #1 was from the nonsoil fill.

Samples #2 & 3

Sample #4

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 8, continued SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, N.Y.
Shelby tube sampling LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/9/79 COMPLETED 6/9/79

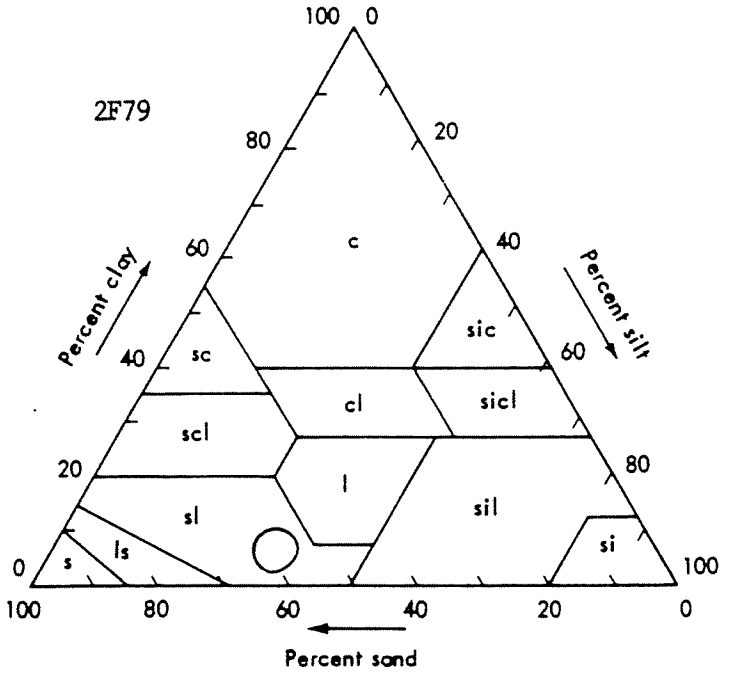
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
							Same as previous page.	
20		6	6	18		24		
								21.0
	5	100/1"					Extremely moist pink sandy loam (SILTY-SAND) with 5 to 10% fine subangular dolomitic gravel, very firm, non-plastic	
								21.6
							Refusal at 21.6 feet.	Water table 12.4 ft. below surface at completion.
25								

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW:

LOGGED BY Donald W. Owens, Soil Scientist SHEET 2 OF 2

HOLE #8, continued

2F79



Sample #5

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 9 SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, N.Y. LOCATION 100 ft. south of original site between railroad tracks (see survey)
Shelby tube sampling

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/9/79 COMPLETED 6/9/79

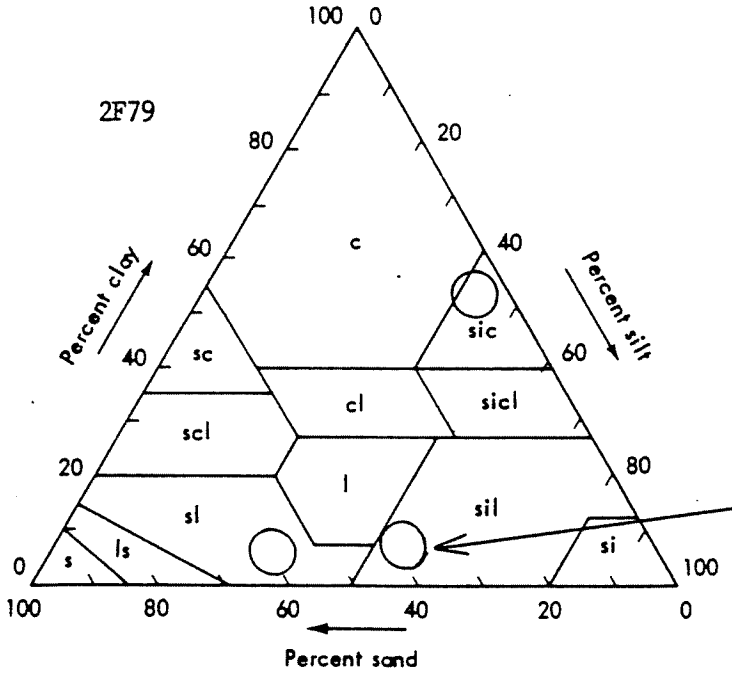
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
							Moist becoming wet at 1.5 ft., black cinders, metal filings, and slag, very firm in place, very friable when disturbed, nonplastic	Sample #1 was from the fill only.
	1	13	22	37		59		
								Shelby tube penetrating 2 ft. of SILTY-CLAY between 5 and 7 foot depths with 10 inches of recovery.
								4.5
5								
		SHELBY TUBE SAMPLE						Nonsoil fill to 4.5 ft. over clayey lake sediments to 15.0 ft. over coarse silt lake sediments to 16.5 ft. over loamy glacial till to refusal.
	2	20	28	32		60	Moist reddish brown SILTY-CLAY with vertical gray desiccation cracks and thin silt lenses, extremely firm (stiff), plastic, sticky	
10								
	3	22	30	34		64		
15								
	4	24	32	38		70	- - - - clear transition to - - - - - - -	15.0
							Wet pink coarse silt loam (SANDY-SILT) with very fine sand lenses, medium consistence, stratified, nonplastic	
	5	18	24					16.5
							(See page #2)	

Continued on page #2 ....

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens, Soil Scientist SHEET 1 OF 2

HOLE #9



Sample #1 was from the nonsoil fill.

Samples #2 & 3

Sample #4

Sample #5

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 9, continued SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, N.Y. LOCATION 100 ft. south of original site between railroad tracks (see survey)
Shelby tube sampling

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/9/79 COMPLETED 6/9/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	6	36	10	12	23	22	Extremely moist pink sandy loam (SILTY-SAND) with 5 to 15% subangular dolomitic gravel, nonplastic	
20		25	19	100/2"				
	7							20.7
							Refusal at 20.7 feet.	Water table 15 ft. below surface at completion and rising. Noticed seepage from nonsoil fill zone.
25								

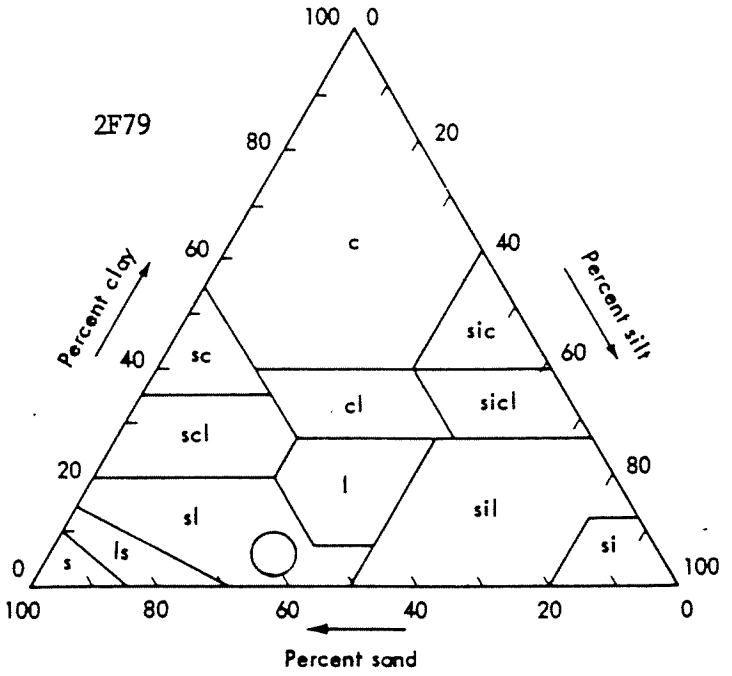
dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens, Soil Scientist SHEET 2 OF 2

HOLE #9, continued

2F79

Samples #6 & 7



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 10 SURF. ELEV. _____

PROJECT Airco Alloys, Niagara Falls, N.Y. LOCATION See survey
2F79 Shelby tube soil sampling

CLIENT ~~Secured Landfill Contractors, Inc.~~ DATE STARTED 6/11/79 COMPLETED 6/11/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	9	15	21		36	Moist blackish gray, with layers of reddish brown, granular textured industrial fill consisting flyash, slag and other industrial waste materials, friable, but firm in place.	Industrial fill to 3.5 feet over water sorted sand sediments to 13.0 feet over a dense loamy glacial till that may contain some larger size boulders to refusal.
								1.3'
							~~Shelby~~ Tube Soil Sample	
5	2	7	11	21		32	Moist distinctly mottled brown SILTY-CLAY, with vertical desiccation cracks and coarse silt-fine sand lenses, occasional stone fragments, very firm, slightly plastic.	Shelby sample taken from 2.3 to 4.3 foot depths, 24 inch sample compacted to 19 inches. SILTY-SAND noticed at bottom of Shelby tube sample.
								3.5'
							Extremely moist becomming wet at 6½ feet, distinctly mottled brownish red, fine sandy loam (SILTY-SAND) grading to fine SAND, stratified, friable but firm in place.	
10	3	15	21	24		45		
								Increase in stone fragments noticed by auger penetration.
								13.0
							Extremely moist to wet brownish red fine sandy loam (SILTY-SAND), 10 to 15% subangular and subrounded gravel, very firm in place, nonplastic, massive soil structure.	
15	4	40	71	111/1"				
								16.1'
							Refusal at 16.1 feet.	Water level 6.5 feet below surface at completion.

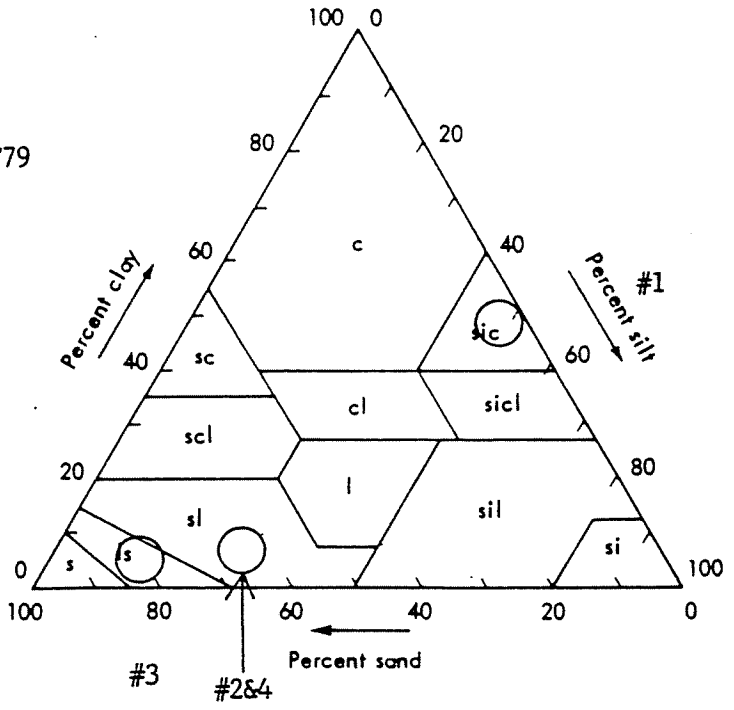
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 38 " PER BLOW.

djr

LOGGED BY Steven J. Pitt, Soil Scientist SHEET 1 OF 1

HOLE #10

2F79



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 11 SURF. ELEV. _____

PROJECT Airco Alloys, Niagara Falls, N.Y. LOCATION See survey
2F79 Shelby tube soil sampling

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/11/79 COMPLETED 6/11/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	\	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	35	69	86		155	Moist blackish gray grading to whitish gray granular textured industrial fill, very dense almost cemented in areas, friable when disturbed.	Industrial waste fill to 2.8 feet over clayey lake sediment to 8.4 feet over coarse silt and fine sand lake sediment to 9.0 feet over loamy glacial till to refusal.
	2	10	14					2.8'
5	SHELBY TUBE SOIL SAMPLE						Moist reddish brown, distinctly mottled SILTY-CLAY with vertical desiccation cracks and coarse silty-fine sand lenses, occasional stone fragments, very firm, sticky plastic.	Shelby tube sampling from 4.0 to 6.0 ft. depths, 24 inch sample compacted to 19 inches.
	3	11	14	15		29		
	4	15	16	13		29	— clear transition to — — —	8.4'
	5						Extremely moist reddish brown, distinctly mottled, fine sandy loam (SILTY-SAND)and coarse silt loam (SANDY-SILT), stratified, medium consistence, non-plastic	
10	6	34	18	56		74		9.0'
							Extremely moist reddish brown fine sandy loam (SILTY-SAND) with 10 to 15% subangular and subrounded dolomitic gravel, very firm in place, non-plastic, massive soil structure	12.8'
15							Refusal at 12.8 feet	Water level 7.0 feet below surface at completion

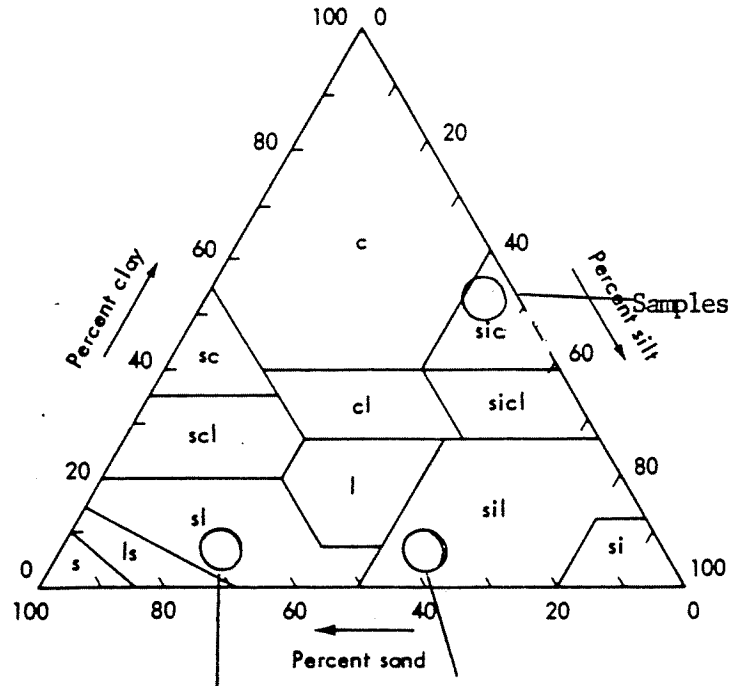
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Steve J. Pitt, Soil Scientist SHEET 1 OF 1

HOLE # 1

2F79

Sample #1 was from industrial waste fill.



Samples # 2 & 3

Samples # 5 & 6

c	Clay
si	Silt
s	Sand
l	Loam
sc	Sandy clay
sic	Silty clay

Sample # 4

scl	Sandy clay loam
sicl	Silty clay loam
cl	Clay loam
sil	Silt loam
sl	Sandy loam
ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

SURF. ELEV. _____

WELL & HOLE NO. 12

2F79 PROJECT Airco Alloys, Niagara Falls, New York
Monitoring well installation

LOCATION See survey

CLIENT Secured Landfill Contractors, Inc.

DATE STARTED 6/12/79 COMPLETED 6/12/79

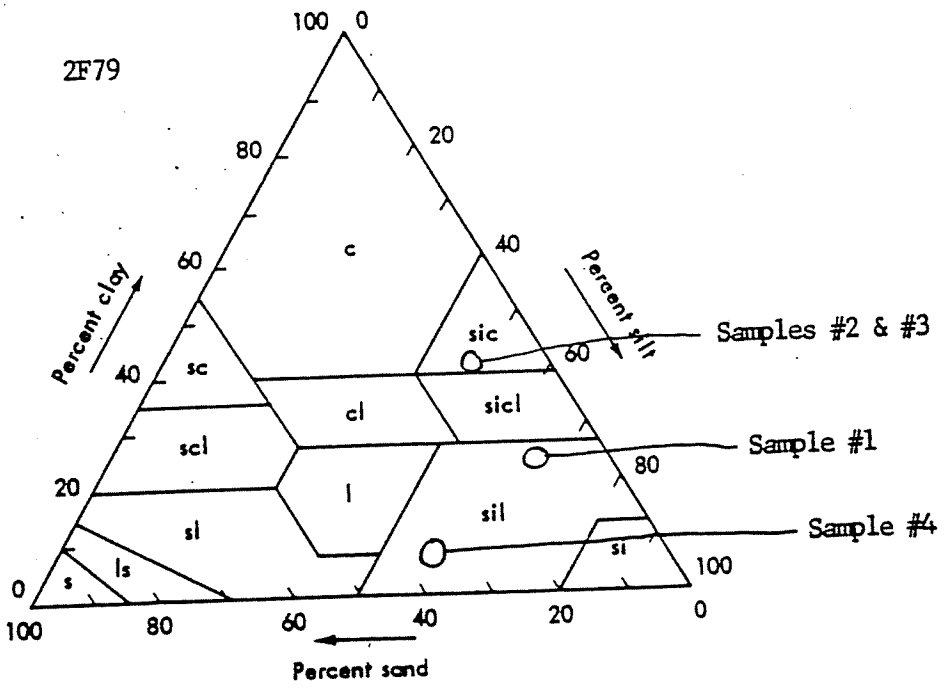
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER (6" / 6" / 12" / 18" / 24" / N)	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS	WELL
	1	4 5 5 7 5	Moist dark brown silt loam (CLAYEY-SILT) fill/topsoil, very friable		1.0	①
			2.0			2 inch PVC pipe
					3.0	Sand Pack
5	2	4 4 5 5 5	Moist to faintly mottled reddish brown, silty clay (CLAYEY-SILT), thinly laminated, very firm, plastic, sticky			Sand Pack
					5.0	
					① Bentonite	
10	3	4 3 4 5 4		4 inch PVC pipe		
				Bentonite	13.0	
			----- clear transition to ---14.5			
15	4	1 2 3 2 3	Extremely moist to wet brownish red coarse silt loam (SANDY-SILT), thinly laminated soil liquified when disturbed, nonplastic			
			17.0			
				Sand	17.5	

See page #2

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Steven J. Pitt, Soil Scientist

WELL & HOLE #12



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

WELL & HOLE NO. 12, continued SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, New York LOCATION See survey
Monitoring well installation

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/12/79 COMPLETED 6/12/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
							Extremely moist to wet, brownish red coarse silt loam (SANDY-SILT) with 10 to 15% subangular and subrounded gravel, nonplastic, massive soil structure	Sand	18.0
20							Refusal at 18.0 feet.		Soil fill/topsoil to 2.0 ft. over silty and clayey lake sediments to 14.5 ft. over coarse silty lake sediments to 17.0 ft. over loamy glacial till to refusal.
							Shallow well #12-A notes: A 7.5 ft. X 2 in. PVC pipe slotted 2 ft. from bottom was placed in a 5.0 ft. hole. Six inches of sand was placed on the bottom of the hole. Sand was packed around sides of well to 1.0 ft. A bentonite cap was then placed on well. This left a 3.0 ft. stick-up. No well screen surrounds well slots.		Water level 13.0 ft. below surface at completion.
							Deep well notes: A 20 X 4 in. PVC pipe, slotted 2 in. from bottom with a stainless steel wire screen covering slots, was placed in a 18.0 ft. hole. 6 in. of sand was placed at the bottom of the hole. Sand was then packed along sides of well up to 13.0 ft. Bentonite pellets were used to seal pipe at the CLAYEY-SILT level, then loose bentonite was filled to the surface, this left a 2.5 ft. stick-up.		

dew

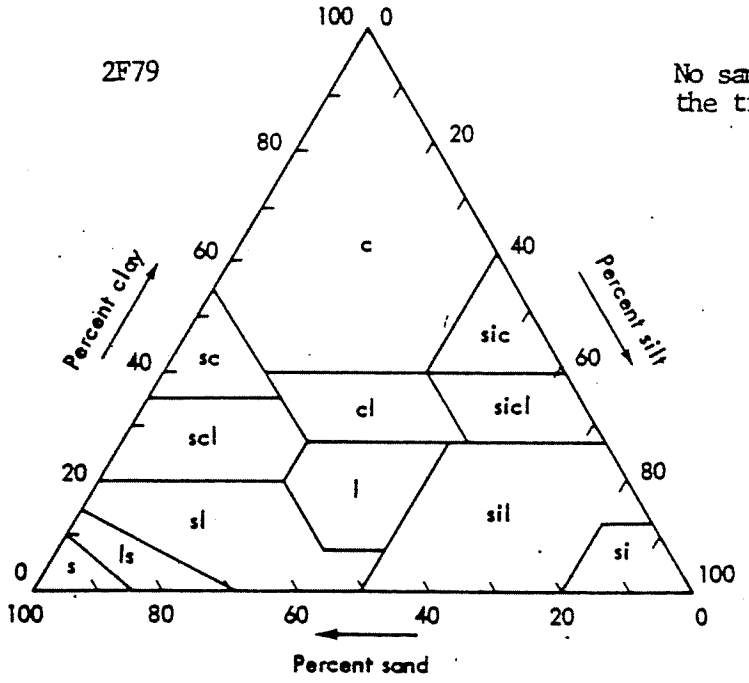
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Steven J. Pitt, Soil Scientist SHEET 2 OF 2

WELL & HOLE #12, continued

2F79

No sample collected from the till zone.



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

WELL & HOLE NO. 13 SURF. ELEV ______

2F79 PROJECT Airco Alloys, Niagara Falls, New York — Monitoring well installation LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/12/79 COMPLETED 6/12/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24		DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS	WELL
	1	7	5	5	7	5	Moist black and whitish gray indistrial fill consisting of fly ash, slag and very dense gray material, friable but very firm in place	4 inch PVC pipe; Bentonite	1.0	(1)
3.0										
5	2	5	5	6	6	6	Moist reddish brown, highly mottled SILTY-CLAY with gray vertical desiccation cracks and silt lenses, occasional stone fragments, very firm, plastic, sticky		4.5; 6.5; 7.0	2 inch PVC pipe; Sand pack; Sand
10	3	5	4	5	6	5			10.0	
13.0							------ celar transition to -- (SDK)	Sand pack	(1) Bentonite	
15	4	2	2	4	6	4	Extremely moist to wet brownish red coarse silt loam (SANDY-SILT), medium consistance, nonplastic			

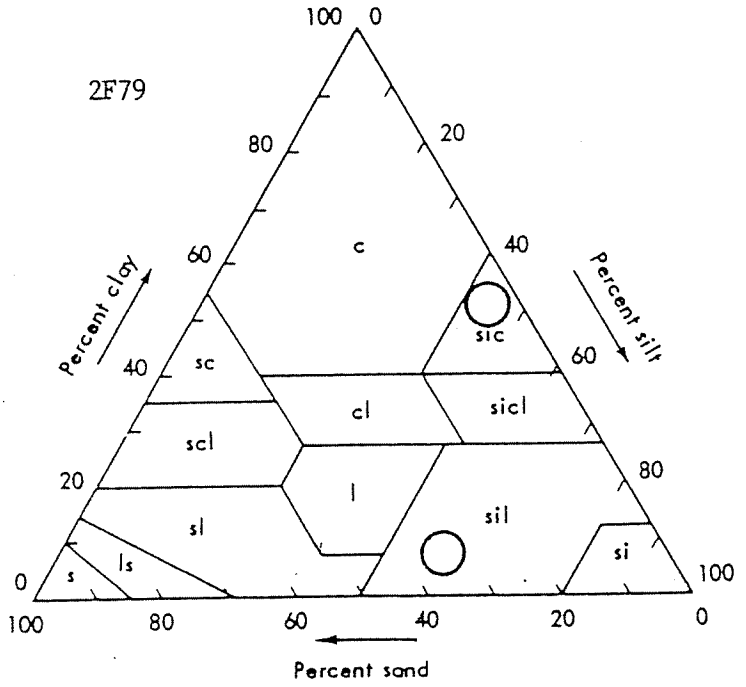
Continued on page #2

dew N = NUMBER OF BLOWS TO DRIVE 2" SPOON 6" WITH 300 lb. WT. FALLING 30" PER BLOW

LOGGED BY Steven J. Pitt, Soil Scientist SHEET 1 OF 2

WELL & HOLE #13

2F79



Sample #1 was from the nonsoil fill.

Samples #2 & 3

Sample #4

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

WELL & HOLE NO. 13, continued SURF. ELEV. _____

2F79 PROJECT Airco Alloys, Niagara Falls, New York LOCATION See survey
Monitoring well installation

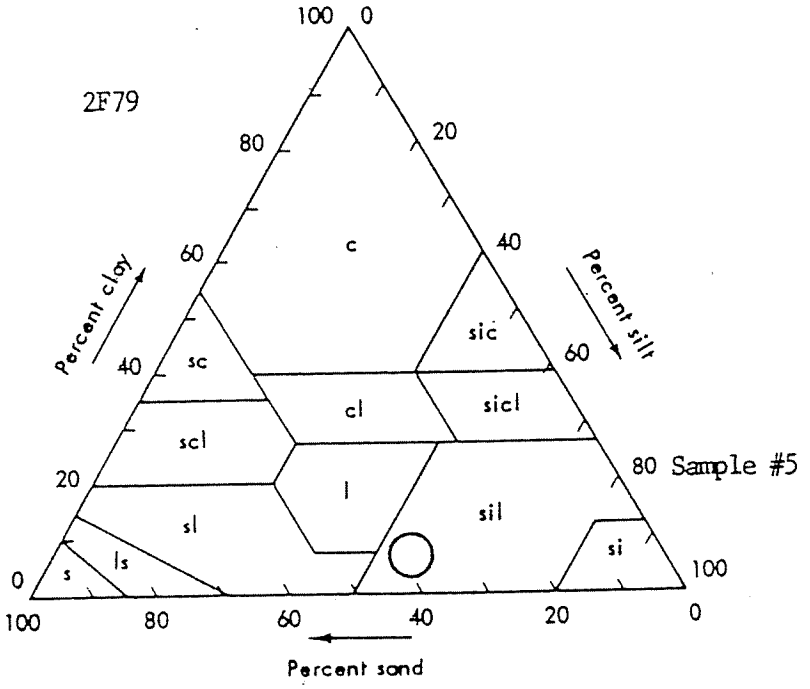
CLIENT Secured Landfill Contractors, Inc. DATE STARTED 6/12/79 COMPLETED 6/12/79

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
			Same as previous page 18.3		18.0
			Extremely moist to wet brownish red coarse silt loam (SANDY-SILT) with 10 to 15% subangular and subrounded gravel, very firm, nonplastic 20.0	Sand Pack	
20	5	Grab sample			
			Refusal at 20.0 feet.		Water level 12.0 ft. below surface at completion.
			Shallow well #13-A notes: 10 ft. by 2 in. PVC pipe slotted 2 ft. on bottom was placed in a 7.0 ft. hole. Well sits on top of 6 in. of sand, with sand packed along sides to 10.0 ft., a bentonite seal was placed to surface, this left a 3.5 ft. stick-up.		Nonsoil industrial waste fill to 3.0 ft. over clayey lake sediments to 13.0 ft. over coarse silty lake sediments to 18.3 ft. over loamy glacial till to refusal.
			Deep well notes: 20 ft. X 4 in. PVC pipe slotted 2 ft. on bottom with stainless steel rapped around slots. Well sits on top of 2 ft. of sand with sand packed along sides to 10.0 ft. A bentonite seal was placed from 10.0 ft. to surface. There was a 2 ft. stick-up.		

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Steven J. Pitt, Soil Scientist SHEET 2 OF 2

WELL & HOLE #13, continued



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 16 SURF. ELEV. _____

779c PROJECT Secured Landfill Soil Investigation SKW, Niagara Falls, New York LOCATION See survey

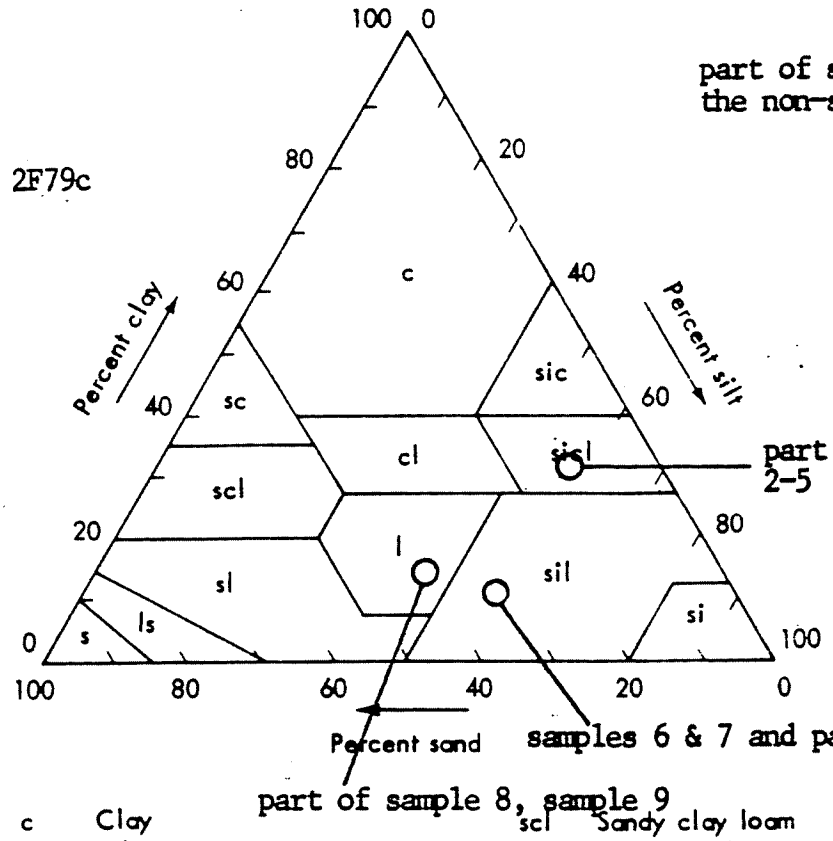
CLIENT Secured Landfill Contractors, Inc. DATE STARTED 9/19/80 COMPLETED 9/19/80

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	1	2	4	18	6	Extremely moist dark brown wood chips, soft	0.5
							Extremely moist dark gray cindery slag, firm	1.0
	2	7	11	18	24	29	Moist highly mottled brownish gray silty clay loam (CLAYEY-SILT), very firm	
	3	6	10	15	20	25	- - - -clear transition to - - - - -	2.0
5							Moist distinctly mottled grayish brown silty clay loam (CLAYEY-SILT) with vertical gray desiccation cracks, very firm	
	4	4	9	20	24	29	- - - -clear transition to - - - - -	4.0
	5	6	11	13	15	24	Moist faintly mottled brown silty clay loam (CLAYEY-SILT) with extremely moist thin coarse silt lenses, very firm	
							- - - -clear transition to - - - - -	10.0
10	6	4	9	19	11	28	Extremely moist brown silt loam (SANDY-SILT) with very thin fine SAND lenses, nonplastic	
							- - - -clear transition to - - - - -	14.0
	7	1	1	2	3	3	Wet brown coarse silt loam (SANDY-SILT) with thin very fine sand lenses, nonplastic, soil material tended to liquefy when disturbed, soft	
	8	1	1	5	11	6	- - - -clear transition to - - - - -	15.5
15							Wet grayish brown gravelly loam (SANDY-SILT) with 15 to 25% mostly dolomitic gravels, very firm, massive soil structure	Water table at 14.0 feet below surface at completion.
	9	16	100/0					16.5
							Refusal at 16.5 feet.	

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bh LOGGED BY Donald W. Owens/Soil Scientist SHEET 1 OF 1

HOLE #16:



part of sample 1 was from the non-soil fill zone

2F79c

part of sample 1, samples 2-5

samples 6 & 7 and part of sample 8

part of sample 8, sample 9

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm) and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 17 SURF. ELEV. _____

2F79c PROJECT Secured Landfill Soil Investigation, SKW, Niagara Falls, New York LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 9/19/80 COMPLETED 9/19/80

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	11	16	17	16	33	Moist black cindery slag fill, very firm	1.5
	1							
	1						Moist reddish brown silty clay loam (CLAYEY-SILT) fill with 2-5% gravel, very firm	2.0
	1							
	2	7	10	17	26	27	Moist distinctly mottled brown silty clay loam (CLAYEY-SILT) with nearly vertical gray desiccation cracks, very firm	
	2							
	2							
	2							
	3	12	16	19	20	35		
5	3						- - - -clear transition to - - - - - -	4.5
	3							
	3						Moist brown coarse silt loam (SANDY-SILT), thinly bedded silts, nonplastic	
	4	7	10	12	17	22		
	4							
	4						- - - -grades downward to - - - - - -	8.0
	4							
	4						Extremely moist brown coarse silt loam (SANDY-SILT), thinly bedded silts with very thin fine sand lenses, nonplastic	
	5	6	7	7	12	14		
	5							
	5							
10	5						- - - -clear transition to - - - - - -	12.0
	6	1	7	6	7	13	Wet brown very fine sandy loam (SANDY-SILT), nonplastic	
	6							
	6							
	6						- - - -clear transition to - - - - - -	16.0
	7	1	7	10	15	17	Wet grayish brown gravelly loam (SANDY-SILT) with 15 to 25% mostly dolomitic gravel, firm, massive soil structure	
	7							
	7							
	7							
	8	6	12	14	13	26		
15	8							
	8	No recovery						
	8							
	9	4	7	12	15	19		
	9							
	9							

Non soil fill to 1.5 feet over silty soil fill to 2.0 feet over silty lake sediment to 4.5 feet over coarse silty lake sediment to 12.0 feet over very fine sandy loam lake sediment to 16.0 feet over loamy glacial till to refusal.

continued on page 2

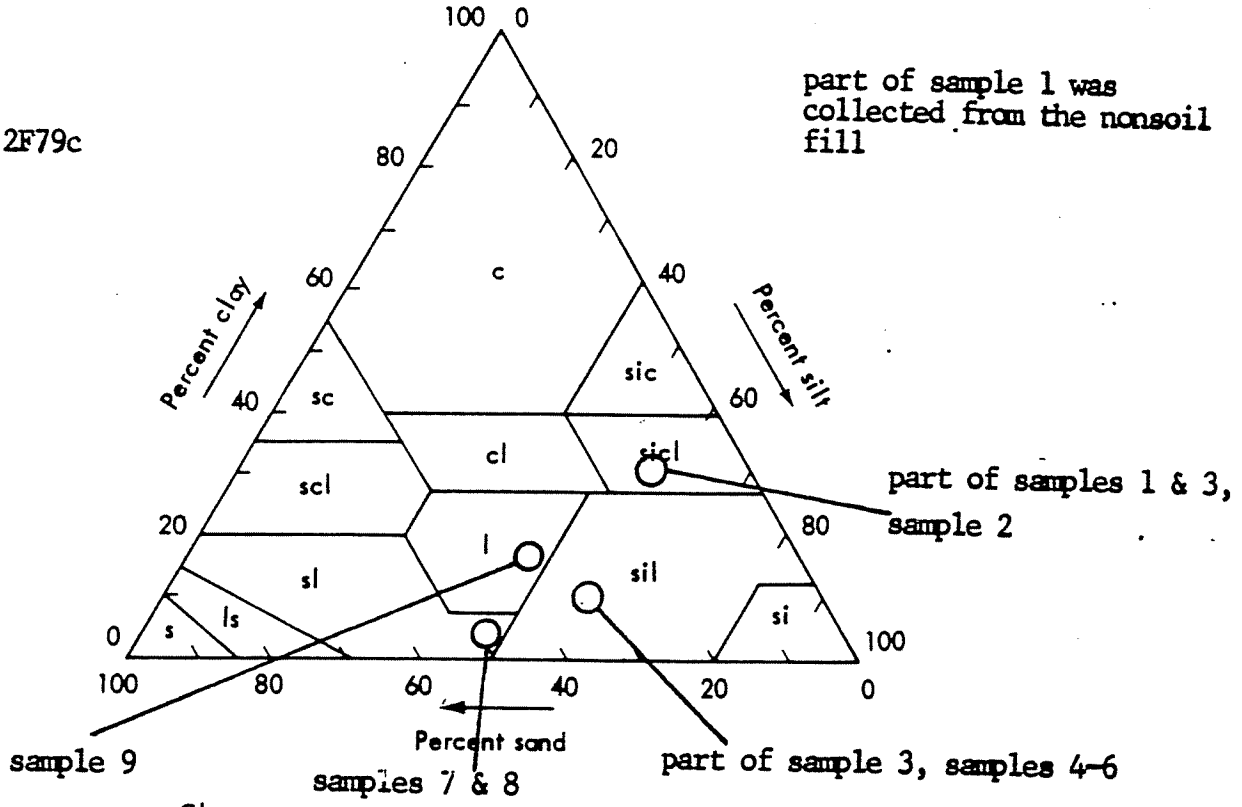
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bh LOGGED BY Donald W. Owens/Soil Scientist SHEET 1 OF 2

HOLE #17:

2F79c

part of sample 1 was collected from the nonsoil fill



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 17 continued SURF. ELEV. _____

F79c PROJECT Secured Landfill Soil Investigation LOCATION see survey
SKW, Niagara Falls, New York

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 9/19/80 COMPLETED 9/19/80

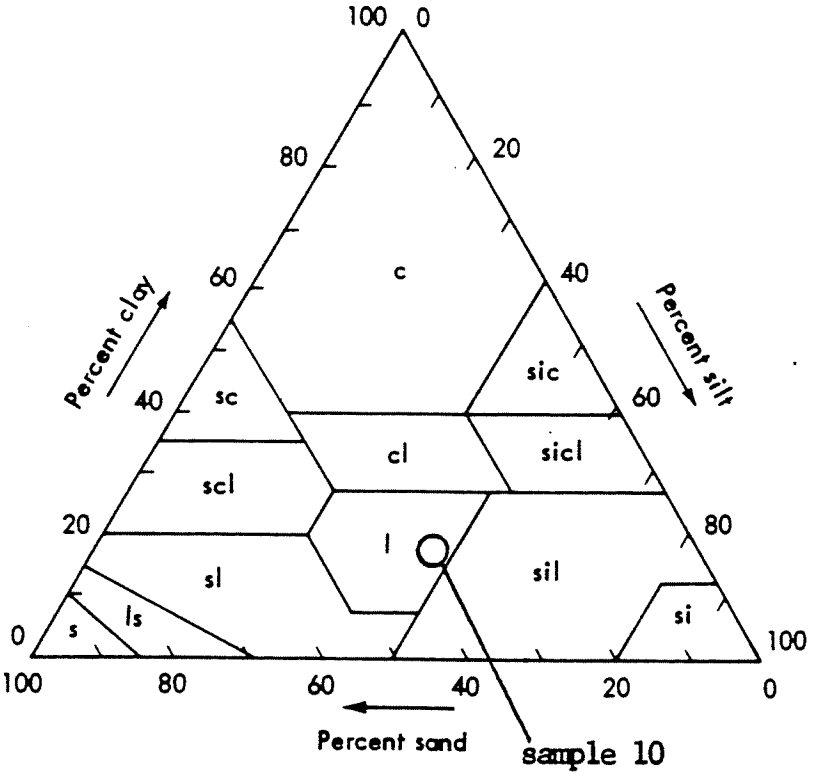
DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	9						Wet grayish brown gravelly loam (SANDY-SILT) with 15 to 25% mostly dolomitic gravel, firm, massive soil structure	
	10	19	23	100/4"				
	10							
	10							19.3
20							Refusal at 19.3 feet	Water table at 10.7 feet below surface at completion.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bh LOGGED BY Donald W. Owens/Soil Scientist SHEET 2 OF 2

HOLE #17:

2F79c



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 18 SURF. ELEV. _____

?F79c PROJECT Secured Landfill Soil Investigation SKW, Niagara Falls, New York LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 9/20/80 COMPLETED 9/20/80

DEPTH (Feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	3	6	15	25	21	Moist black cindery slag, loose	0.5
	1						Moist reddish brown silty clay loam (CLAYEY-SILT) fill with 2 to 5% stone fragments, very firm	1.5
	1							
	2	17	25	22	10	47	Moist gray cemented slag	2.5
	2						Wet grayish yellow sand size slag, loose	3.5
	2							
	3	3	6	12	17	18	Moist reddish brown silty clay loam (CLAYEY-SILT) fill with 2 to 5% gravels, very firm	5.0
5	3							
	3						Extremely moist dark gray silty clay loam (CLAYEY-SILT) original topsoil, firm	5.7
	4	7	17	26	27	43		
	4						Moist distinctly mottled brownish gray silty clay loam (CLAYEY-SILT), very firm	
	4							
	5	8	12	13	16	25	- - - -clear transition to - - - - -	6.0
	5						Moist distinctly mottled reddish brown silty clay loam (CLAYEY-SILT) with nearly vertical gray desiccation cracks, very firm	7.0
	5							
10	5							
	6	6	9	8	9	17		
	6							
	6							
	6							
	7	1	4	4	5	8		
	7							
	7							
	7							
	8	4	5	7	10	12	Wet reddish brown very fine sandy loam (SILTY-SAND) bedded with thin fine sand lenses, nonplastic	
15	8							
	8							
	8							
	9	9	10	20	23	30		
	9							
	9						- - - -clear transition to - - - - - see page two	17.5

Nonsoil fill to 0.5 feet over mostly soil fill to 1.5 feet over nonsoil fill to 3.5 feet over soil fill to 5.0 feet over silty lake sediment to 7.0 feet over very fine sandy loam lake sediment to 17.5 feet over loamy glacial till to refusal.

Water table at 6.5 feet below surface at completion.

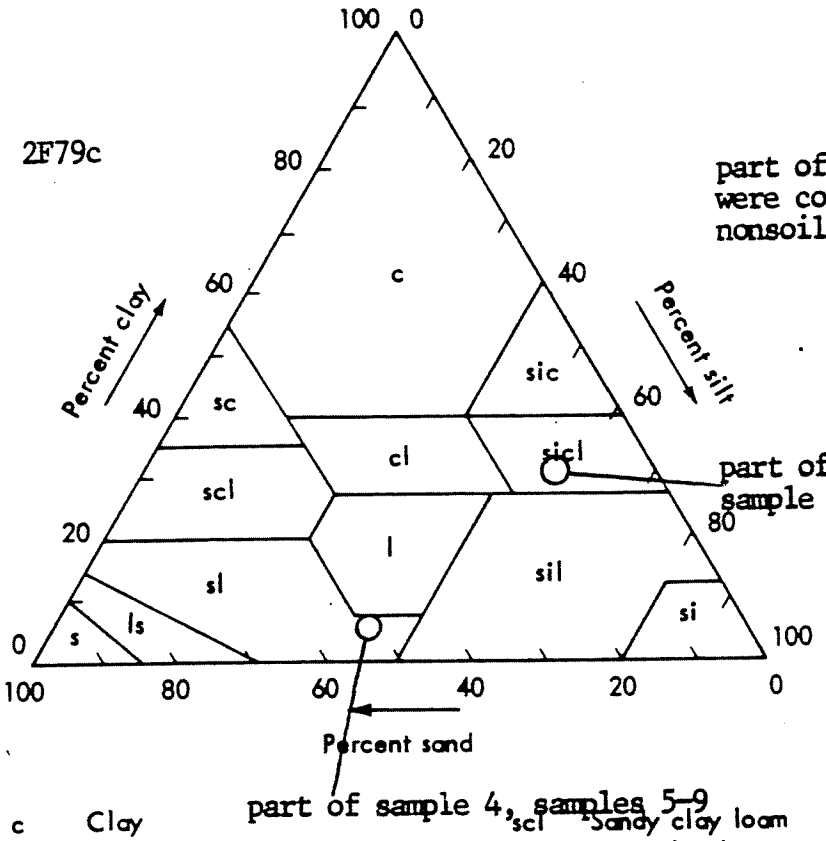
continued on page 2...

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bn LOGGED BY Donald W. Owens/Soil Scientist SHEET 1 OF 2

HOLE #18:

2F79c



part of samples 1 & 2 were collected from the nonsoil fill zones

part of samples 1, 2 & 4, sample 3

part of sample 4, samples 5–9

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 18 continued SURF. ELEV. _____

2F79c PROJECT Secured Landfill soil investigation LOCATION See survey
SKW, Niagara Falls, New York
CLIENT Secured Landfill Contractors DATE STARTED 9/20/80 COMPLETED 9/20/80

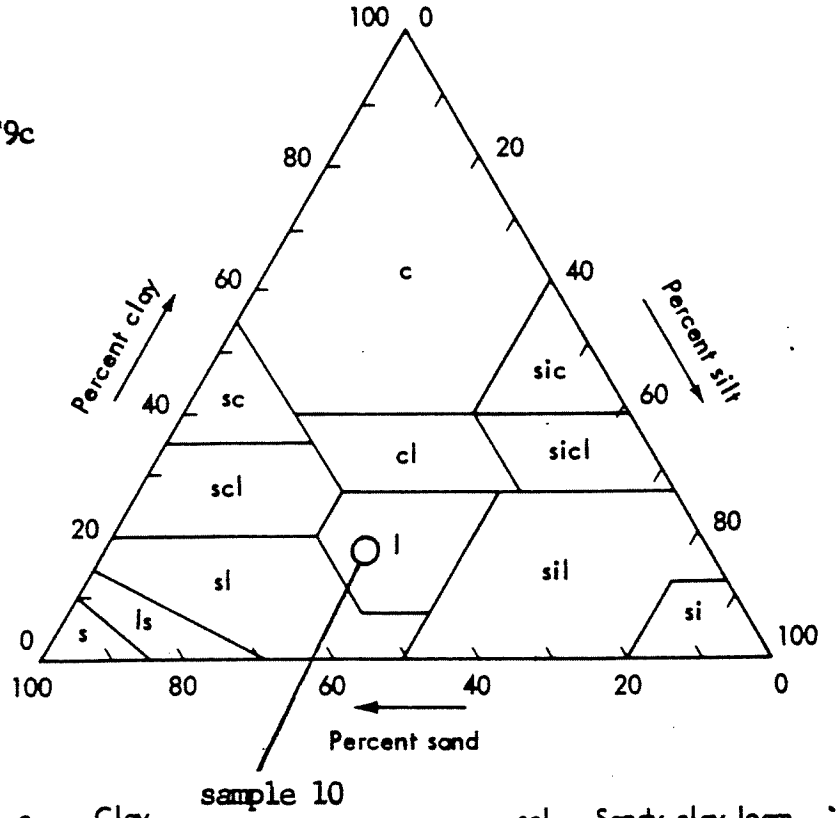
DEPTH (Feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	9						Wet grayish brown gravelly sandy loam (SILTY-SAND) with 15 to 25% mostly dolomitic gravel, firm, massive soil structure	
	10	26	100/4"					18.8
20	10						Refusal at 18.8 feet.	

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bh LOGGED BY Donald W. Owens/Soil Scientist SHEET 2 OF 2

HOLE #18 continued:

2F79c



c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

HOLE NO. 19 SURF. ELEV. _____

2F79c PROJECT Secured Landfill Soil Investigation SKW, Niagara Falls, New York LOCATION See survey

CLIENT Secured Landfill Contractors, Inc. DATE STARTED 9/20/80 COMPLETED 9/20/80

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	35	45	49	97	94	Moist mixed black and white cemented slag with a 3" zone between 1.0 and 1.3 foot depth reddish brown (CLAYEY-SILT) fill	
	2	6	8	11	15	19	Moist brown silty clay loam (CLAYEY-SILT) fill with 2-5% gravel, very firm	2.0
	3	10	12	24	26	36	Moist black silty clay loam (CLAYEY-SILT) original topsoil, very firm	2.8
5	4	6	17	21	21	38	Moist distinctly mottled brown silty clay loam (CLAYEY-SILT) with vertical gray desiccation cracks, very firm	4.0
							- - - -clear transition to - - - - -	5.0
	5	8	16	26	32	42	Moist reddish brown silty clay loam (CLAYEY-SILT) with very thin coarse silt lenses, very firm	
							- - - -clear transition to - - - - -	6.0
10							Moist brown coarse silt loam (SANDY-SILT), bedded, nonplastic	
							- - - -clear transition to - - - - -	8.0
	6	10	11	18	20	29	Extremely moist brown coarse silt loam (SANDY-SILT), bedded and with thin interbeds of silty clay loam (CLAYEY-SILT), nonplastic	
	7	3	3	4	8	7	- - - -clear transition to - - - - -	12.0
	8	2	4	8	6	12	Wet brown interbeds silty clay (CLAYEY-SILT) and coarse silt loam (SANDY-SILT), soft	
15							- - - -clear transition to - - - - -	16.5
	9	1	1	100/½"			Wet brown silt loam (SANDY-SILT) with 10 to 15% mostly dolomitic gravel, soft, massive soil structure	
							Refusal at 17.1 feet.	17.1

Mostly nonsoil fill to 2.0 feet over soil fill to 2.8 feet over silty lake sediment to 6.0 feet over coarse silty lake sediment to 8.0 feet over silty lake sediment to 16.5 feet over loamy glacial till to refusal.

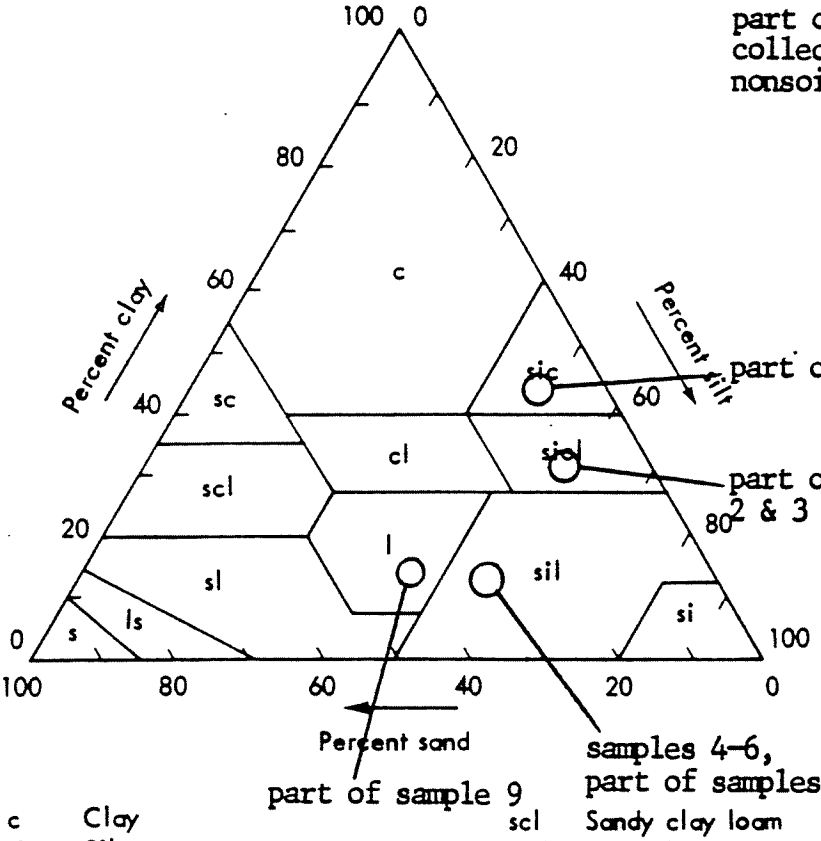
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bh LOGGED BY Donald W. Owens/Soil Scientist SHEET 1 OF 1

HOLE #19:

2F79c

part of sample 1 was collected from the nonsoil zone



part of samples 7-9

part of sample 1, samples 2 & 3

samples 4-6, part of samples 7-9

part of sample 9

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 3R-88 SURF. ELEV. _____

PROJECT 4L78b Monitoring well installation Landfill site, Whitmer Rd. town of Niagara LOCATION Due north of first landfill facility, 123' W and 18' S of NE trench corner

CLIENT SKW ALLOYS, INC. DATE STARTED 11/16/88 COMPLETED 11/16/88

SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
1	3 4 5 6	9	Extremely moist dark brown silty clay loam (CLAYEY-SILT) with 1 to 3% mostly fine size subangular gravel, stiff, weak blocky soil structure with fine size roots 2.0	2" Inside diameter PVC riser pipe (1) 2.7 (2) 4.0	Possible disturbed silty lake sediment to 2.0 feet over clayey lake sediment to 4.5 feet over water sorted and deposited very fine sand with some silt to 6.0 feet over loamy glacial till to refusal.
2	6 10 13 15	23	Moist distinctly mottled brown (SILTY-CLAY) with 1 to 5% mostly fine size gravel with nearly vertical gray desiccation cracks 4.5 - - - - grades downward to - - - -		(1) Cement bentonite grout.
3	6 7 10 9	17	Extremely moist to wet faintly mottled reddish brown to brown very fine sandy loam (SILTY-SAND) with some silt, compact, has a tendency to liquify when disturbed, thinly bedded 6.0 - - - - clear transition to - - - -	2" PVC #10 slotted screen 4.7 #2 size sand 9.7	(2) Bentonite pellet seal.
4	6 5 6 13	11	Extremely moist to wet brown gravelly loam (SANDY-SILT) with 15 to 25% mostly subangular dolomite gravel, occasional cobble, little to some very fine to coarse size sand, compact with slight brittle consistence, massive soil structure 8.5 - - - - grades downward to - - - -		Advanced 6 5/8 inch augers to 9.7 feet.
5	19 26 100/4"		Extremely moist to wet brown gravelly loam (SILTY-SAND) with 15 to 40% mostly subangular dolomitic gravel, occasional cobble, very fine to coarse size sand, some silt, dense with brittle consistence, massive soil structure 9.7		Water level at 9.5 feet below ground surface at completion, could not soil sample.
			Refusal at 9.7 feet.		

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens/Soil Scientist
Dale M. Gramza/Geologist

SHEET ___ OF 1

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

Damaged. replaced 90

MONITORING WELL HOLE NO. 5R-88

SURF. ELEV. _____

PROJECT 4L78b: Monitoring well installation; Landfill site, Whitmer Rd. town of Niagara

LOCATION: Approximately 250 ft. S of S toe of first LF. 50 ft. W of No. 17

CLIENT: SKW ALLOYS, INC.

DATE STARTED 11/16/88 COMPLETED 11/16/88

SAMPLE NO	BLOWS ON SAMPLER (0/6, 6/12, 12/18, 18/24)	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
1	3 / 19 / 22 / 50/3"	41	Extremely moist black very gravelly sandy loam (SILTY-SAND) fill with 40 to 60% mostly angular to subangular gravel and slag, occasional cobble, very fine to coarse size sand, little silt, very dense in place, loose when disturbed — 2.0	Two (2) inch inside diameter PVC riser pipe; Cement-bentonite grout	Mixed sand and gravel fill with slag and little silt to 2.0 feet over claye soil fill to 2.5 feet over sand and gravel fill with slag and little sil to 6.0 feet over clayey lake sedimen to 11.0 feet over coarse silty lake sediment to 14.0 feet over water sor ed and deposited very fine size sand with some silt to 15.5 feet over loam glacial till to end of boring.
2	3 / 6 / 10 / 9	16	Extremely moist distinctly mottled reddish brown (SILTY-CLAY) fill, very stiff — 2.5		
3	4 / 2 / 4 / 4	6	Extremely moist to wet faintly mottled black very gravelly sandy loam (SILTY-SAND) fill with 40 to 60% mostly subangular gravel and slag, very fine to coarse size sand, little silt loose and compact, loose when disturbed — 6.0		
4	2 / 5 / 7 / 11	12	Extremely moist distinctly mottled grayish brown (SILTY-CLAY), stiff, weak thinly laminated with very thin coarse silt lenses, noticed black discoloration along nearly vertical gray desiccation cracks — 8.0		10.0
5	4 / 7 / 10 / 10	17	└ - - - grades downward to - - - 8.0	(1)	Water level at 16.3 feet below ground surface at completion of soil sampling.
6	4 / 5 / 6 / 8	11	Extremely moist alternating reddish brown (SILTY-CLAY) very stiff, weak thinly laminated with very thin coarse silt lenses and nearly vertical gray desiccation cracks — 11.0		12.0
7	6 / 8 / 8 / 13	16	└ - - - clear transition to - - 11.0	2" PVC #10 slotted screen; #2 size sand	13.5
8	8 / 10 / 12 / 10	22	Extremely moist reddish brown silt loam (SANDY-SILT), compact weak thinly bedded, soil material tends to liquify when disturbed — 14.0		(1) Bentonite pelle seal.
9	12 / 14 / 17 / 14	31	└ - - - grades downward to - - - 14.0		
10	11 / 14 / 10/3"		Wet brown very fine sandy loam (SILTY-SAND) with some silt, compact, tends to liquify when disturbed, thinly bedded — 15.5		18.5
			└ - - - grades downward to - - - 15.5		19.3

Continued on sheet 2.

~~See next sheet.~~

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens/Soil Scientist
Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 5R-88 continued SURF. ELEV. _____

PROJECT Monitoring well installation LOCATION Approximately 250 ft. S of S toe
4L78b Landfill site, Whitmer Rd. town of Niagara of first LF, 50 ft. W of No. 17
CLIENT SKW ALLOYS, INC. DATE STARTED 11/16/88 COMPLETED 11/17/88

SAMPLE NO.	BLOWS ON SAMPLER 0" / 6" / 12" / 18" / 24" / N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
		Wet brown gravelly loam (SILTY-SAND) with 15 to 25% mostly sugangular gravel, very fine to medium size sand, some silt, compact, massive soil structure	19.3
		Refusal at 19.3 feet.	Water level at 16.3 feet below ground surface at completion of soil sampling.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens/Soil Scientist
Dale M. Gramza/Geologist SHEET 2 OF 2

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 14N

SURF. ELEV. _____

PROJECT 41.78b Monitoring well installation
Landfill site, Whitmer Rd., town of Niagara

LOCATION 18 feet south of original MW 14N

CLIENT SKW ALLOYS, INC.

DATE STARTED 11/17/88 COMPLETED 11/17/88

ELEV.	BLOWS ON SAMPLER (0 / 6/12 / 12/18 / 18/24 / N)	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
		Advanced 6 5/8" augers without sampling to 4.0 feet, auger debris wet black very gravelly loamy sand (SAND) fill with 50 to 70% mostly subangular gravel and slag with cobbles, very dense in place, loose when disturbed 4.0	Two (2) inch inside diameter PVC riser pipe; Cement bentonite grout	Sand and gravel fil with slag to 4.0 feet over clayey la sediment to 10.0 fee over coarse silty lake sediment to 13 feet over clayey lak sediment to 14.0 fee over coarse silty lake sediment with little sand to 16.0 feet over water sor ed and deposited ver fine size sand with little silt to 19.0 feet over loamy glacial till to end of boring.
	1 6 9 14 17 23	Moist faintly mottled alternating brown and reddish brown (SILTY-CLAY) very stiff, becoming hard below 6.0 foot depth, weak thinly laminated with very thin coarse silt lenses and occasional nearly vertical gray desiccation cracks		
	2 7 15 18 20 33	- - - - grades downward to - - - 8.0		
	3 4 6 7 12 13	Moist faintly mottled brown silty clay (CLAYEY-SILT), stiff, weak thinly laminated with very thin coarse silt lenses and nearly vertical gray desiccation cracks		
10	4 7 9 10 16 19	- - - - - grades downward to - - - 10.0 Extremely moist brown silt loam (SILT) compact, weak thinly bedded, soil material tends to liquify when disturbed 13.5		12.3 (1) Bentonite pellet seal. WR-Sampler penetration with weight of rods.
	5 5 7 9 9 16	Extremely moist alternating gray and grayish brown silty clay (CLAYEY-SILT), stiff, thinly laminated with very thin coarse silt lenses	(1)	14.1 WH-Sampler penetration with weight of rods and hammer.
15	6 2 4 6 8 10	- - - - clear transition to - - 14.0		15.3
	7 WR WH 2 4 <3	Wet reddish brown silt loam (SANDY-SILT) with little very fine size sand, loose, has slight tendency to liquify when disturbed, thinly bedded with occasional thin 1/16 to 1/8 inch thick (SILTY-CLAY) lenses	Two (2) inch PVC #10 slotted screen; #2 size sand	
	8 WR WR 3 3 <4	- - - - clear transition to - - 16.0		
20		See next sheet.		Continued on sheet 2.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens/Soil Scientist
Dale M. Gramza/Geologist

SHEET 1 OF 2

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL HOLE NO. 14N continued

SURF. ELEV. _____

PROJECT 41.78b Monitoring well installation Landfill site, Whitmer Rd. town of Niagara

LOCATION 18 feet south of original MW 14N

CLIENT SKW ALLOYS, INC.

DATE STARTED 11/17/88 COMPLETED 11/17/88

DEPTH	BLOWS ON SAMPLER (3 / 6 / 12 / 18 / 24 / N)	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
0	12	Wet reddish brown very fine sandy loam (SILTY-SAND) with little silt, very loose, readily liquifies when disturbed, thinly bedded	(1)	20.3
	14 13 17 27	- - - - graces downward to - - 19.0	(2)	22.0
		Wet brown gravelly sandy loam (SILTY-SAND) with 15 to 30% mostly subangular gravel, very fine to medium size sand, little silt, very loose becoming compact below 20.0 foot depth, massive soil structure 22.0		(1) Two (2) inch PVC #10 slotted screen. (2) #2 size sand. Water level at 8.6 feet below ground surface at completion of sampling.
20		Boring completed at 22.0 feet.		
30				
40				

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Donald W. Owens/Soil Scientist
Dale M. Gramza/Geologist

SHEET 2 OF 2

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

MONITORING WELL
HOLE NO. 5R Replacement — SURF. ELV. _____

PROJECT Well replacement — LOCATION See survey

4L78c Landfill Site, Witmer Road, Town of Niagara

CLIENT SKW ALLOYS — DATE STARTED 5/10/90 — COMPLETED 5/10/90

DEPTH FEET	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24 N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	1	4 15 8 9 — 23	Moist gray very gravelly sandy loam (SILTY-SAND) fill with 60 to 70% crushed gravel and slag with very fine to very coarse sand size, little silt, compact in place, loose when disturbed		Sand and gravel fill to 0.5 feet over silty soil fill with little gravel, trace to little sand to 4.0 feet over sand and gravel fill with little silt to 6.0 feet over mixed coarse silty and silty soil fill to 8.0 feet over clayey lake sediment to 10.0 feet over coarse silty to silty lake sediment to 12.0 feet over water sorted and deposited sand with little to some silt to 16.5 feet over loamy glacial till to refusal.
	2	23 16 7 16 — 23			
5	3	8 10 50/5"	Moist distinctly mottled mixed brown and light reddish brown gravelly silt loam (CLAYEY-SILT) fill with 15 to 25% gravel and slag, trace to little very fine size sand, very stiff		
	4	4 3 3 5 — 6	0.5 / 4.0		
	5	3 3 4 6 — 7	Wet brown very gravelly sandy loam (SILTY-SAND) fill with 60 to 70% mostly subangular gravel, very fine to coarse size sand, little silt, very dense in place, loose when disturbed		
10	6	3 4 4 6 — 8	- - - clear transition to - - - 6.0		
	7	2 4 5 5 — 9	Extremely moist faintly mottled mixed grayish brown gravelly silt loam (SANDY-SILT) fill with 15 to 25% gravel, little very fine to medium size sand and brown silt loam (CLAYEY-SILT) fill with trace very fine size sand		
15	8	4 8 9 10 — 17	8.0		
	9	3 5 8 13 — 13	Extremely moist distinctly mottled brown silty clay loam (CLAYEY-SILT), firm, weakly thinly laminated with very thin coarse silt lenses		
	10	100/1"	- - - grades downward to - - - 10.0		
20			Moist faintly mottled brown silt loam (SILT) tending toward (CLAYEY-SILT), stiff, weakly thinly laminated 12.0		
			Wet reddish brown very fine sandy loam (SILTY-SAND) with little to some silt, loose becoming compact below 14.0 feet, soil material readily liquifies when disturbed, thinly bedded, noticed thin (CLAYEY-SILT) lenses between 12.0 to 14.0 foot depth 16.5		

WELL: Cement-bentonite Grout 7.0; 2" PVC inside diameter PVC pipe; (1) 10.0; (2) 10.7; 2" Slotted PVC Screen; #2 Size Sand 12.0; 17.0; 18.1

(1) Bentonite pellet seal

(2) 550 fine size sand

Water level at 10.2 feet below ground surface at completion.

Screen #10 slotted.

Continued on sheet 1A.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

eal LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

ITORING WELL
E NO. 5P Replacement continued — SURF. ELV. _____

JECT Well replacement — LOCATION See survey

7c Landfill Site, Witmer Road, Town of Niagara

ENT SKW ALLOYS — DATE STARTED 5/10/90 COMPLETED 5/10/90

TH	SAMPLE NO.	BLOWS ON SAMPLER (0/6 / 6/12 / 12/18 / 18/24)	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	1	4 15 8 9	23	See previous sheet.	Cement-bentonite Grout	7.0
	2	23 16 7 16	23		(1)	
	3	8 10 50/5"			2" PVC inside diameter PVC pipe	10.0
	4	4 3 3 5	6		(2)	10.7
	5	3 3 4 6	7			12.0
	6	3 4 4 6	8		#2 Slotted PVC Screen	
	7	2 4 5 15	9		#2 Size Sand	
	8	4 8 6 10	17			17.0
	9	3 15 18 43	33	Moist reddish brown gravelly loam (SILTY-SAND) with 15 to 30% mostly subangular gravel, very fine to fine size sand, little to some silt, very dense with brittle consistence, massive soil structure 18.1		18.1
	10	100/1"		Refusal at 18.1 feet.		

16.5

(1) Bentonite Pellet Seal

(2) 550 fine size sand

= NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Dale M. Gramza/Geologist — SHEET 1A OF 1A