APPENDIX A

PADER CONSENT ORDER
LIST OF PARAMETERS FOR MONITORING POINTS
SEPTEMBER 1985 TO OCTOBER 1987

DRAFT

Semi-Annually

Aluminum
Calcium
Total Iron
Manganese
Magnesium
Sodium
Lead*
Chromium*
Fluoride
Total Phosphorus
Nitrate - N
Nitrite - N
Ammonia - N
Chloride
Sulfate
BOD
Alkalinity
Total Dissolved Solids
pH
Specific Conductance
Organic Carbon
VOCs - Method 624

* Added to the list in March 1987.

MEISER & EARL, INC. **Hydrogeologists**

1512 WEST COLLEGE AVENUE, STATE COLLEGE, PENNSYLVANIA 16801 814 234-0813

February 13, 1990

Mr. Joseph Mihm
Canonie Environmental Services
500 North Gulph Road
Suite 315
King of Prussia, PA 19406

CANONIE
KOP
RECEIVED
FEB 15 1990

Re: Delta RI/FS
Altoona, PA

Dear Joe:

Enclosed is a summary of historical analytical results for samples collected from site and homeowner wells related to the Delta Landfill. These tables represent our attempt to compile the organic and inorganic analytical results that we have gathered from the sampling conducted during our involvement at the Delta Landfill. There are, however, qualifiers to these summary tables that we have identified which must be mentioned. These qualifiers or known data gaps are as follow:

1. We believe that there may be additional analyses for the Caracciolo and Nail wells on April 8, 1981, but we are unable to locate the data.

2. There are probably other analyses that have not been included in these tables, but we believe that these tables are relatively comprehensive.

3. We have edited these tables several times, but we do not guarantee that the data presented is without errors or that there are not inadvertent data omissions.

We hope that these tables are of use to you.

Sincerely,

Heidi R. Battista

Heidi R. Battista

HRB/lae
Enclosures

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ==>	CARACCIOLO WELL		CHANNEL FLOW	CONNOR WELL						CULVERT									FAM SPRING
Date	11-18-82	11-4-85	10-3-85	7-15-86	9-24-86	3-23-87	9-29-87	4-14-88	9-7-88	10-3-85	3-26-86	6-17-86	7-15-86	9-24-86	3-24-87	9-29-87	4-14-88	9-7-88	9-21-82
Sampled By	PADER	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	PADER	M & E	M & E	M & E	M & E	M & E	M & E	PADER
Chloroethane		ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND		
1,1 Dichloroethylene																			2
1,1 Dichloroethane			16																51
1,2 Dichloroethene												16							300
1,2 Trans Dichloroethylene			32																
1,1,1 Trichloroethane			17									8							93
Trichloroethylene			12									8.5							120
Tetrachloroethylene												14							23
1,1,2 Trichloroethane																			
Methylene Chloride									8									32	
Vinyl Chloride																			
Benzene																			
2-Butanone																			
Chlorodifluoromethane																			
Chlorofluoromethane																			
Dichlorodifluoromethane																			
Dichlorofluoromethane (tentative)																			
Dioxane																			
Ethanol (tentative)																			
Ethyl Benzene																			
Ethyl Ether (tentative)																			
1,1' - Oxybis Ethane (tentative)																			
Phenol																			
Phenol (tentative)																			
Toluene																			
Trichlorofluoromethane																			
Trichloromethane (Chloromethane)	POS TRACE																		
TOV Screen				1									31						
Laboratory	PADER	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	PADER	NUS	NUS	NUS	NUS	NUS	NUS	PADER
Total VOC's		0	77	1	0	0	0	0	8	0	0	46.5	31	0	0	0	0	32	589
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit												1							
VOC Scan										ND	ND								

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	[illegible]
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

AR303575

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ==>>	FAM SPRING																GILBERT WELL		
Date Sampled By	9-30-82 PADER	10-19-82 PADER	11-15-82 PADER ****	3-2-83 M & E	3-27-84 PADER	11-1-84 M & E	5-7-85 M & E	9-19-85 M & E	9-19-85 PADER	3-26-86 M & E	6-17-86 PADER	9-24-86 M & E	3-24-87 M & E	9-29-87 M & E	4-14-88 M & E	9-7-88 M & E	9-21-82 PADER	3-27-84 M & E	11-4-85 M & E
Chloroethane					DET				2.8								ND		ND
1,1 Dichloroethylene		2			DET		2		2.1										
1,1 Dichloroethane		59		22	46	47	52	43	56	30	200	24	48	58	28	35			
1,2 Dichloroethene		250			120*				165		300					97			
1,2 Trans Dichloroethylene				90		136	143	160		140		87	120	130	84				
1,1,1 Trichloroethane	70	96	DET	70	90	72	117	69	90	45	90	33	59	48	52	63			
Trichloroethylene	110	130	DET	130	58	75	78	78	82	68	200	40	64	59		51		<1	
Tetrachloroethylene	18	20	DET	20	87	7	14	12	15	9	15		9	8	7	7			
1,1,2 Trichloroethane			DET						1.7										
Methylene Chloride							1									10			
Vinyl Chloride																			
Benzene						95													
2-Butanone																			
Chlorodifluoromethane																			
Chlorofluoromethane																			
Dichlorodifluoromethane																			
Dichlorofluoromethane (tentative)																			
Dioxane																			
Ethanol (tentative)																			
Ethyl Benzene																			
Ethyl Ether (tenative)																			
1,1' - Oxybis Ethane (tentative)																			
Phenol																			
Phenol (tenative)																			
Toluene																			
Trichlorofluoromethane																			
Trichloromethane (Chloromethane)																			
TOV Screen																			
Laboratory	PADER	PADER	PADER	NUS	PADER	LANC	LANC	NUS	PADER	NUS	PADER	NUS	NUS	NUS	NUS	NUS	PADER	PADER	NUS
Total VOC's	198	557		332	401	432	407	362	414.6	292	805	184	300	303	171	263	0	1	0
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit									1		1								
VOC Scan																			

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	Estimated
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

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AR303576

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	GEORGE WELL										HOLLINGS-HEAD WELL	JOAN JONES WELL		LEACHATE FROM ROADSIDE	LEHMAN WELL	McCARTNEY WELL	HAIL WELL		
Date	10-20-82	6-15-83	3-27-84	9-19-85	3-26-86	9-24-86	3-23-87	9-29-87	4-14-88	9-7-88	11-4-85	3-27-84	11-4-85	11-18-82	11-4-85	3-27-84	11-18-82	3-27-84	11-4-85
Sampled By	PADER	M & E ***	PADER	M & E ****	M & E	M & E	M & E	M & E	M & E	M & E	M & E	PADER	M & E	PADER	M & E	PADER	PADER	PADER	M & E
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND		ND		ND		ND
1,1 Dichloroethylene																			
1,1,Dichloroethane																			
1,2,Dichloroethene																			
1,2,Trans Dichloroethylene																			
1,1,1 Trichloroethane																			
Trichloroethylene																			
Tetrachloroethylene																<1			
1,1,2 Trichloroethane																<1			
Methylene Chloride																			
Vinyl Chloride									5.3*****										
Benzene										11									
2-Butanone																			
Chlorodifluoromethane																			
Chlorofluoromethane																			
Dichlorodifluoromethane																			
Dichlorofluoromethane (tentative)																			
Dioxane																			
Ethanol (tentative)																			
Ethyl Benzene														POS DET					
Ethyl Ether (tenative)																			
1,1' - Oxybis Ethane (tentative)																			
Phenol																			
Phenol (tenative)																			
Toluene																			
Trichlorofluoromethane																			
Trichloromethane (Chloromethane)																			
TOV Screen																			
Laboratory	PADER	MUS	PADER	MUS	MUS	MUS	MUS	MUS	MUS	MUS	MUS	PADER	MUS	PADER	MUS	PADER	PADER	PADER	MUS
Total VOC's	0	0	0	0	0	0	0	0	0	11	0	0	0		0	0	0	0	0
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit																		<1	
VOC Scan																			

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	Estimated
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

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1512 W. COLLEGE AVE.
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AR303577

A-2

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	OTTO WELL	ROOKEY WELL	SEEP #1	SEEP #2	SEEP #3	SEEP #4	SEEP #5	SEEP #6	STIFFLER WELL		G. STOTLER WELL		J. STOTLER WELL					
Date	3-27-84	11-4-85	6-17-86	6-17-86	6-17-86	6-17-86	6-17-86	6-17-86	11-19-82	3-27-84	11-18-82	11-4-85	9-21-82	11-15-82	2-1-83	6-15-83	3-27-84	9-19-85
Sampled By	PADER	M & E	PADER	PADER	PADER	PADER	PADER	PADER	PADER	PADER	PADER	M & E	PADER	PADER ****	PADER	M & E ***	PADER	PADER **
Chloroethane	ND	ND	9								ND	ND			ND	ND		1.7
1,1 Dichloroethylene																		
1,1 Dichloroethane			90	36	8		2	3.8					6				3.7	3.9
1,2 Dichloroethene			650	200	7.2	10	10	110					4				1.2	1.9
1,2 Trans Dichloroethylene																		
1,1,1 Trichloroethane			150	75	9.6	80	20	23										
Trichloroethylene			100	95	5.3	17	7.8	22					2				<1	
Tetrachloroethylene			55	27	5.7	170	27	19	2	1.7			POS TRACE	POS TRACE			<1	1.1
1,1,2 Trichloroethane																		
Methylene Chloride																		
Vinyl Chloride																		
Benzene																		
2-Butanone																		
Chlorodifluoromethane																		
Chlorofluoromethane																		
Dichlorodifluoromethane																		
Dichlorofluoromethane (tentative)																		
Dioxane																		
Ethanol (tentative)																		
Ethyl Benzene										1.3								
Ethyl Ether (tenative)																		
1,1' - Oxybis Ethane (tentative)																		
Phenol																		
Phenol (tenative)																		
Toluene					2.2													
Trichlorofluoromethane																		
Trichloromethane (Chloromethane)																		
TOV Screen																		
Laboratory	PADER	NUS	PADER	PADER	PADER	PADER	PADER	PADER	PADER	PADER	PADER	NUS	PADER	PADER	PADER	NUS	PADER	PADER
Total VOC's	0	0	1054	433	38	277	66.8	177.8	2	3	0	0	12	0	0	0	4.9	8.6
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit			1	1	1	1	1	1										
VOC Scan																		

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	Estimated
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

AR303578

MEISER & EARL, INC. / Hydrogeologists
1512 W. COLLEGE AVE.
STATE COLLEGE, PA 16801

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	J. STOTLER								WELL 2			WELL M1-LINED							
Date	9-19-85	3-26-86	9-24-86	3-23-87	9-29-87	11-4-87	4-13-88	9-7-88	2-1-83	2-1-83	6-15-83	2-2-83	2-2-83	6-16-83	9-18-85	3-25-86	9-23-86	3-23-87	10-15-87
Sampled By	M & E ****	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E ***	PADER	M & E ***	PADER	M & E	M & E	M & E ****	M & E	M & E	M & E	M & E
Chloroethane	ND	ND	ND	ND		ND	ND		ND	ND	ND								
1,1 Dichloroethylene												37	30	42					8
1,1 Dichloroethane												2							
1,2 Dichloroethene												95	72	130	61	23	66	32	42
1,2 Trans Dichloroethylene												POS TRACE							
1,1,1 Trichloroethane												92	71	60	83	24	92	49	52
Trichloroethylene												2							
Tetrachloroethylene												4							
1,1,2 Trichloroethane																			
Methylene Chloride					19			14				2		13					
Vinyl Chloride																			
Benzene														150					
2-Butanone																			
Chlorodifluoromethane												DET							
Chlorofluoromethane												DET							
Dichlorodifluoromethane												DET							
Dichlorofluoromethane (tentative)												DET			8			8	
Dioxane																			
Ethanol (tentative)																			1200
Ethyl Benzene																			
Ethyl Ether (tenative)																			
1,1' - Oxybis Ethane (tentative)																			
Phenol																			
Phenol (tenative)																			
Toluene																			71
Trichlorofluoromethane																			
Trichloromethane (Chloromethane)												DET							
TOV Screen																			
Laboratory	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	PADER	NUS	PADER	NUS	NUS	NUS	NUS	NUS	NUS	NUS
Total VOC's	0	0	0	0	19	0	0	14	0	0	0	234	173	395	152	47	158	89	1373
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit																			
VOC Scan																			

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	Estimated
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

MEISER & EARL, INC. / Hydrogeologists
1512 W. COLLEGE AVE.
STATE COLLEGE, PA 16801

AR303579

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	WELL M1-LINED		WELL M2-LINED			WELL M2-AREA IV								WELL 4-79					
Date	4-13-88	9-7-88	2-1-83	2-1-83	10-3-85	2-1-83	2-1-83	9-19-85	3-25-86	9-23-86	3-23-87	4-13-88	9-6-88	2-1-83	2-1-83	6-15-83	9-18-85	3-25-86	3-24-87
Sampled By	M & E	M & E	M & E ***	PADER	M & E	M & E	PADER	M & E ****	M & E	M & E	M & E	M & E	M & E	M & E ***	PADER ***	M & E ***	M & E ****	M & E	M & E
Chloroethane			ND	ND	ND									ND	ND	ND	ND	ND	ND
1,1 Dichloroethylene							1												
1,1 Dichloroethane	45	40				36	43	22	13	18	12		14		POS TRACE				
1,2 Dichloroethene							180						55						
1,2 Trans Dichloroethylene						160		100	80	85	38	21							
1,1,1 Trichloroethane	55	46				90	100	51	30	43	24	17	38						
Trichloroethylene						100	130	63	49	51	31	17	35						
Tetrachloroethylene						20	25	11	8	5	5		5						
1,1,2 Trichloroethane																			
Methylene Chloride		13											14						
Vinyl Chloride																			
Benzene																			
2-Butanone																			
Chlorodifluoromethane																			
Chlorofluoromethane																			
Dichlorodifluoromethane																			
Dichlorofluoromethane (tentative)																			
Dioxane																			
Ethanol (tentative)																			
Ethyl Benzene																			
Ethyl Ether (tentative)																			
1,1' - Oxybis Ethane (tentative)																			
Phenol																			
Phenol (tentative)																			
Toluene																			
Trichlorofluoromethane																			
Trichloromethane (Chloromethane)																			
TOV Screen																			
Laboratory	NUS	NUS	NUS	PADER	NUS	NUS	PADER	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS
Total VOC's	100	99	0	0	0	406	479	247	180	202	110	55	161	0	0	0	0	0	0
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit																			
VOC Scan																			

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	Estimated
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

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1512 W. COLLEGE AVE.
STATE COLLEGE, PA 16801

AR303580

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	WELL 5-79					WELL 6-85							WELL 7-85						WELL 8-85
Date	10-2-85	9-23-86	9-29-87	4-13-88	9-6-88	9-18-85	3-25-86	9-23-86	3-23-87	10-15-87	4-14-88	9-6-88	9-18-85	3-25-86	9-23-86	3-23-87	10-15-87	9-6-88	9-18-85
Sampled By	M & E	M & E	M & E	M & E	M & E	M & E ****	M & E	M & E	M & E	M & E	M & E	M & E	M & E ****	M & E	M & E	M & E	M & E	M & E	M & E ****
Chloroethane	ND	ND	ND	ND															ND
1,1 Dichloroethylene													140	130	150	110	100	110	
1,1 Dichloroethane						34	20	42	36	24	16	17	9		9	11	10	12	
1,2 Dichloroethene						9	7												
1,2 Trans Dichloroethylene						12		7	5										
1,1,1 Trichloroethane						6	6												
Trichloroethylene																			
Tetrachloroethylene																			
1,1,2 Trichloroethane																			
Methylene Chloride					8							8						10	
Vinyl Chloride																			
Benzene																			
2-Butanone																			
Chlorodifluoromethane																			
Chlorofluoromethane																			
Dichlorodifluoromethane																			
Dichlorofluoromethane (tentative)						10			8										
Dioxane																			
Ethanol (tentative)																			
Ethyl Benzene																			
Ethyl Ether (tenative)																			
1,1' - Oxybis Ethane (tentative)						10	20		20	13			9	10		8	6		
Phenol										23									
Phenol (tenative)																			
Toluene																			
Trichlorofluoromethane																			
Trichloromethane (Chloromethane)																			
TOV Screen																			
Laboratory	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS	NUS
Total VOC's	0	0	0	0	8	81	53	49	69	60	16	25	158	140	159	129	116	132	0
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit																			
VOC Scan																			

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	Estimated
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

AR303581

A-1

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	WELL B-85						WEST FLOW				EAST FLOW	
Date	3-25-86	9-23-86	3-23-87	10-15-87	4-13-88	9-7-88	2-16-84	11-1-84	5-7-85	9-19-85	2-16-84	5-7-85
Sampled By	M & E	M & E	M & E	M & E	M & E	M & E	M & E ****	M & E	M & E	M & E **	M & E	M & E
Chloroethane	ND						ND	ND	ND	ND	ND	ND
1,1 Dichloroethylene												
1,1 Dichloroethane												
1,2 Dichloroethene						140						
1,2 Trans Dichloroethylene		14	27	36	150							
1,1,1 Trichloroethane												
Trichloroethylene					15	11						
Tetrachloroethylene					9	6						
1,1,2 Trichloroethane												
Methylene Chloride						10						
Vinyl Chloride					14	32						
Benzene												
2-Butanone												
Chlorodifluoromethane												
Chlorofluoromethane												
Dichlorodifluoromethane												
Dichlorofluoromethane (tentative)												
Dioxane												
Ethanol (tentative)												
Ethyl Benzene												
Ethyl Ether (tenative)												
1,1' - Oxybis Ethane (tentative)												
Phenol												
Phenol (tenative)												
Toluene												
Trichlorofluoromethane												
Trichloromethane (Chloromethane)												
TOV Screen												
Laboratory	NUS	NUS	NUS	NUS	NUS	NUS	LANC	LANC	LANC	NUS	LANC	LANC
Total VOC's	0	14	27	36	188	199	0	0	0	0	0	0
Method	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS	GC/MS
Detection Limit												
VOC Scan												

KEY / LEGEND

DET	Detected but not quantified
ND	None Detected, above Routine Detection Limits
POS DET	Possibly Detected
POS TRACE	Possible Trace
*	Estimated
**	Acid/Base Neutral Analysis Also Conducted (See Appendix IV in Feb. 1986 Meiser & Earl Hydrogeologic Report)
***	Detection Limit 10 ppb
****	No Base Neutral Priority Pollutants Detected
*****	Laboratory Contaminant

NOTE: All parameters are in ug/l unless otherwise noted.

MEISER & EARL, INC. / Hydrogeologists
1512 W. COLLEGE AVE.
STATE COLLEGE, PA 16801

AR303582

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	CHANNEL FLOW	CONNOR						CULVERT								FAN SPRING				
Date	10-3-85	7-15-86	9-24-86	3-23-87	9-29-87	4-14-88	9-6-88	10-3-85	3-26-86	7-15-86	9-24-86	3-24-87	9-29-87	4-14-88	9-6-88	9-21-82	11-15-82	11-1-84	5-7-85	9-19-85
Sampled By	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	PADER	PADER	M & E	M & E	M & E
Aluminum	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.29	0.29		<0.1	<0.1	2
Calcium	89	116	120	125	115	122	122	88	97	105	75	86	105	90	108			58.5	81.9	84
Iron	0.53	0.1	<0.1	0.33	0.18	0.25	0.17	0.46	0.15	0.23	0.34	0.23	0.55	0.2	0.35	70		<0.05	<0.05	2.4
Manganese	0.13	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	0.84	0.08	0.85	1.3	0.19	0.79	0.34	0.31	0.01		<0.005	<0.005	0.77
Magnesium	11	21	27	24	21	21	24	13	14	10	11	12	13	11	16			7.83	10.5	12
Sodium	8.8	0.97	1.3	1.1	1.2	1.2	1	25	19	20	15	34	31	28	31			5.7	6.5	5.4
Fluoride	0.12	0.07	0.16	0.15	0.12	0.14	0.18	0.12	0.27	0.1	0.17	0.15	0.17	0.16	0.2			<4	<0.4	<0.05
Total Phosphorus	0.06	<0.01	<0.01	<0.01	0.01	0.01	<0.02	0.05	0.06	0.02	0.03	0.02	0.04	0.05	0.04					0.02
Nitrate-NO3	0.6	4.6	1.4	2.1	1.5	1.5	1.5	0.36	2.1	1.2	0.5	1.6	1.1	1.1	0.74	0.88	1.04	<2	0.9	5.5
Nitrite-NO2	0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	0.008	<0.005	0.021	0.005	0.01	0.002	0.002	<2	<0.2	<0.005
Chloride	31	2.5	3	2.7	2.5	<0.5	<0.5	65	62	50	34	62	60	42	57	13	17	24	16.1	20
Sulfate	47	28	25	28	34	37	35	22	64	34	89	33	29	34	73	30	35	30	37	53
B.O.D.	<1.0	1.2	<1	<1	1.1	3.1	<1.0	1.4	2.9	2.5	3.8	3.2	3.5	2.6	<1.0	0.4		<6	<6	1.5
T Organic Carbon	46.1	1.8	2.3	88	7.6	<1	2	13	24.9	5.4	28.3	77	9.5	3	10	1.8			9.5	1.5
Alkalinity	241	342	338	363	344	351	325	255	230	263	141	222	293	229	295	198		202	207	220
Total Dissolved Solids	362	435	393	421	401	426	397	419	444	451	419	385	453	402	579	306		277	252	322
Ammonia-N	0.27	0.33	0.17	0.29	0.11	0.2	<0.04	1.1	0.53	1.1	0.37	0.71	0.9	0.68	0.32	0.01	0.01	<0.5	<0.5	0.19
Lead				<0.01	<0.005	<0.005	0.0078					<0.01	<0.005	<0.005	<0.005	<0.005		<0.05	<0.05	
Chromium				<0.01	<0.005	<0.005	<0.005					<0.01	<0.005	<0.005	<0.005	<0.01		<0.05	<0.05	
pH (units)	7.5	7.3	7.6	7.3	7.3	7.3	7.5	7.7	8	7.6	7.9	8	7.6	7.6	7.7	7		7.23	7.3	7.6
Specific Cond. (umhos/cm)	500	675	665	566	604	601	551	650	650	663	605	596	720	561	732	500				513
Alb-N																				
Arsenic																				
Barium																		0.065	0.071	
Bromide																		<10	<1	
Cadmium																<0.0002		<0.005	<0.005	
COD																<10	<10	<12	9.5	
Coliform (colonies/100ml)																				
Copper																0.01		<0.05	<0.05	
Fecal (colonies/100ml)																				
Hardness (CaCO3)																188				
MBA's																				
Mercury																				
Molybdenum																		<0.05	<0.05	
N - Kjeldahl																				
Nickel																		0.05	<0.05	
Ortho Phosphate (P)																		<20	<2	
Phenolphthalein Alk																		1	<1	
Phenols																	0			
PO4																				
Potassium																		0.8	0.8	
Selenium																				
Silver																		<0.05	<0.05	
Temp (degree C)																				
Total Solids																				
Zinc																0.02		<0.05	<0.05	
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	PADER	PADER	LANC	LANC	FAIRWAY

KEY / LEGEND

FAIRWAY = FAIRWAY LABORATORIES; LANC = LANCASTER LABORATORIES; NUS = NUS CORPORATION; PADER = PA DEPT. OF ENVIRONMENTAL RESOURCES; PENN = PENN ENVIRONMENTAL CONSULTANTS

NOTE: All parameters in mg/l unless otherwise stated.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	FAM SPRING						GEORGE WELL														
Date	3-26-86	9-24-86	3-24-87	9-29-87	4-14-88	9-6-88	6-21-79	11-20-79	2-21-80	6-10-80	9-10-80	1-16-81	4-10-81	7-30-81	9-21-81	12-11-81	3-2-82	6-22-82	9-27-82	12-20-82	3-24-83
Sampled By	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	FAIRWAY	FAIRWAY	FAIRWAY	M & E	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	M & E	FAIRWAY	M & E	M & E
Aluminum	0.2	<0.1	<0.1	<0.1	<0.1	0.2	<0.1			<0.04			<0.02					0.09			
Calcium	94	93	89	94	95	94															
Iron	0.45	<0.1	0.15	0.15	0.34	0.24	7.6	8.8	8.6	8	0.08	6.9	8.5	6.83	7.2	7.5	4.2	4.4	7	7.6	8
Manganese	<0.05	<0.05	0.09	<0.05	0.06	0.05	0.29			0.21			0.29					0.17			
Magnesium	6.5	14	11	11	11	12															
Sodium	3.7	6.5	7.2	7.5	8.8	7.2															
Fluoride	0.17	0.16	0.07	0.1	0.18	0.21	0.24			0.17			0.27					0.24			
Total Phosphorus	<0.02	<0.01	0.01	0.01	<0.01	0.02															
Nitrate-NO3	1.2	1	1.3	1.2	1.2	1.3	0.02			0.03			0.03					0.14			
Nitrite-NO2	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	0.007			<0.001			<0.002					<0.002			
Chloride	17	23	21	22	20	19	4.2	6	3.1	3.5	2.5	3.8	3	4	3.3	3.5	3.5	3.5	3	4.2	3
Sulfate	55	29	30	36	39	37	14	16	26	16	16	12	13	11	10	11	15	14	13	12	12
B.O.D.	1	<1	<1	2.2	3.8	<1.0	<1	1.3	4.2	13	1.2	<1	1.1	<1	<1	1.1	<1	<1	<1	1.3	1.5
T.Organic Carbon	1.9	<1	70	5.8	2	2							1.5					3.4			
Alkalinity	222	240	224	242	232	227	138	136	137	135	123	126	136	134	131	146	138	126	132	133	133
Total Dissolved Solids	317	355	317	359	360	342			288	172	176	189	163	78	190	171	172	188	170	188	157
Ammonia-N	0.09	0.08	0.15	0.15	<0.02	0.06	0.04			0.33			0.15					0.18			
Lead			<0.01	<0.005	<0.005	0.005															
Chromium			<0.01	<0.005	<0.005	<0.005															
pH (units)	7.5	7.6	7.7	7.2	7.3	7.4	7.5	7.5	7.2	7	7.2	7.3	7.2	7.1	6.8	7	6.8	7.2	7.1	7.1	7.3
Specific Cond. (umhos/cm)	479	570	483	539	485	47	266	235	190	246	313	268	304	315	295	254	275	294	280	268	273
Alb-N										0.2			0.13					0.12			
Arsenic																					
Barium																					
Bromide																					
Cadmium																					
COD							8	7.8	55	3.6	<2	3.9	<2	<2	<2	<2	3.5	<2	<2	<2	<2
Coliform (colonies/100ml)																					
Copper																					
Fecal (colonies/100ml)																					
Hardness (CaCO3)																					
MBA's							0.03			0.004											
Mercury																					
Molybdenum																					
N - Kjeldahl																					
Nickel																					
Ortho Phosphate (P)										<0.01			<0.01					<0.01			
Phenolphthalein Alk																					
Phenols																					
PO4							0.003														
Potassium																					
Selenium																					
Silver																					
Temp (degree C)																					
Total Solids																					
Zinc																					
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	PEC	PEC	PEC	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

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NOTE: All parameters in mg/l unless otherwise stated.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

ER030584

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ==>	GEORGE WELL															J. STOTLER WELL					
Date	6-15-83	10-3-83	12-21-83	3-8-84	6-26-84	9-24-84	12-20-84	3-21-85	9-19-85	3-26-86	9-24-86	3-23-87	9-29-87	4-14-88	9-6-88	11-20-79	2-21-80	6-10-80	9-10-80	1-16-81	4-8-81
Sampled By	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	DELTA	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	FAIRWAY	FAIRWAY	FAIRWAY	M & E
Aluminum	<0.1				<0.1				0.24	<0.1	<0.1	<0.1	<0.1	<0.1	0.3			0.08			0.05
Calcium									48	53	50	49	51	55	48						
Iron	8	7.8	7.3	7.6	1.7	8.5	8.8	0.27	8.5	8.3	9	9	11	9.5	8.8	0.11	0.04	0.13	0.13	0.12	0.05
Manganese	0.27				0.66				0.26	0.27	0.24	0.29	0.27	0.32	0.27			<0.01			<0.02
Magnesium									3	3.3	3.6	2.9	3	2.9	3.2						
Sodium									1.7	1	1.7	2.2	2.1	3	3.2						
Fluoride	0.18				0.35				0.21	0.26	0.28	0.18	0.27	0.21	0.29			0.06			0.15
Total Phosphorus									0.02	<0.02	<0.01	0.02	0.02	0.03	<0.02						
Nitrate-NO3	<0.05				<0.05				6.5	1.9	0.11	<0.05	<0.05	<0.02	<0.02			3.8			3
Nitrite-NO2	<0.002				<0.005				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.001			0.004
Chloride	3	3	3	3	3.2	3.2	3.5	3.7	3	2.7	2.7	3.2	3.2	5	2.5	14	14	14	14	15	14
Sulfate	18	15	18	17	20	23	18	20	21	21	11	11	14	15	12	33	47	32	28	22	24
B.O.D.	<1	1.4	1.1	2.5	<1	<1	<1	1.6	1.2	<1	<1	<1	1.3	3.9	<1	2.5	5.2	1	1.7	<1	<1
T Organic Carbon	33.1				32.6				11.2	1.6	6.2	29	4.4	1	1						1.5
Alkalinity	131	135	139	138	139	127	124	150	122	129	130	130	134	138	130	218	216	225	207	210	217
Total Dissolved Solids	179	170	189	196	169	120	178	186	159	168	160	149	165	172	160		368	311	329	288	303
Ammonia-N	0.24				0.27				0.28	0.08	0.16	0.3	0.13	0.23	<0.04			0.22			0.55
Lead												<0.01	<0.005	<0.005	0.006						
Chromium												<0.01	<0.005	<0.005	<0.005						
pH (units)	6.3	7.6	7.1	6.8	7.8	7.1	7.2	8.1	7.5	7.3	7.6	7.3	7.2	7.4	7.5	7.5	6.8	7.1	7.1	7.6	7.1
Specific Cond. (mhos/cm)	215	279	285	334	264	268	230	320	268	254	290	220	264	239	224	393	335	450	496	485	463
Alb-N	0.09				0.2													0.07			0.14
Arsenic																					
Barium																					
Bromide																					
Cadmium																					
COD	<2	7.6	<2	<2	<2	<2	2	<2								20	138	7.2	<2	2	13
Coliform (colonies/100ml)																					
Copper																					
Fecal (colonies/100ml)																					
Hardness (CaCO3)																					
MBA's																		0.006			
Mercury																					
Molybdenum																					
N - Kjeldahl																					
Nickel																					
Ortho Phosphate (P)	<0.01				0.19													0.02			<0.01
Phenolphtholein Alk																					
Phenols																					
PO4																					
Potassium																					
Selenium																					
Silver																					
Temp (degree C)																					
Total Solids																					
Zinc																					
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	PEC	PEC	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

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NOTE: All parameters in mg/l unless otherwise stated.

MEISER & EARL, INC. / Hydrogeologists
1512 W COLLEGE AVE.
STATE COLLEGE, PA 16801

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===> J. STOTLER WELL

Date	7-27-81	9-21-81	12-3-81	3-2-82	7-16-82	9-21-82	9-27-82	11-15-82	12-20-82	3-24-83	6-16-83	9-28-83	12-21-83	3-8-84	6-26-84	9-24-84	12-20-84	3-21-85	9-19-85	3-26-86	9-24-86
Sampled By	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	M & E	PADER	M & E	PADER	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E
Aluminum											<0.1				<0.1				0.72	<0.1	<0.1
Calcium																			85	101	85
Iron	1.34	0.08	<0.02	0.1	0.07	30	0.04		0.06	0.06	0.15	0.15	<0.05	0.13	0.05	0.13	0.13	0.24	2.1	0.15	<0.1
Manganese					<0.02	10					<0.05				<0.05				<0.05	<0.05	<0.05
Magnesium																			8.8	5	11
Sodium																			3.7	2.4	4
Fluoride					0.19						0.15				0.1				0.08	0.18	0.17
Total Phosphorus																			0.04	<0.02	<0.01
Nitrate-NO3					3.2	2.41		3.96			3.6				0.6				7.3	3.3	2.9
Nitrite-NO2					<0.002	0.006		0.002			0.02				0.007				<0.005	<0.005	<0.005
Chloride	16	15	15	14	16	66	17	4	17	15	16	17	16	16	15	17	15	16	15	13	13
Sulfate	26	24	24	29	25	25	27	20	29	27	30	29	36	37	36	41	39	34	42	47	26
B.O.D.	<1	<1	1.5	<1	<1	0.6	<1		1.3	1	1.6	<1	<1	1.3	<1	<1	1.3	<1	1	<1	<1
T Organic Carbon					3.1	5.2					54.8				55.1				3.3	1.2	<1
Alkalinity	218	221	228	229	218	224	224		246	231	229	225	231	247	251	233	174	223	219	215	204
Total Dissolved Solids	324	298	318	297	352	434	329		326	313	390	356	316	362	336	312	328	324	316	309	304
Ammonia-N					0.24	0.15		0.01			0.18				0.19				0.24	0.15	0.12
Lead						<5															
Chromium						<10															
pH (units)	7.2	7	7.2	6.9	6.9	7	7		7.1	7.2	6.4	7.2	7.3	7.1	7.5	7	7.1	7.3	7.4	7.3	7.6
Specific Cond. (umhos/cm)	550	575	563	500	575	545	519		521	521	488	600	516	650	563	563	514	515	514	478	516
Alb-N					0.14						0.1				0.16						
Arsenic																					
Barium																					
Bromide																					
Cadmium						0.3															
COD	<2	<2	<2	<2	5.3	104	<2	<10	<2	<2	<2	<2	<2	<2	1.8	<2	8	<2			
Coliform (colonies/100ml)																					
Copper						20															
Fecal (colonies/100ml)																					
Hardness (CaCO3)						238															
MBA's																					
Mercury																					
Molybdenum																					
N - Kjeldahl																					
Nickel																					
Ortho Phosphate (P)					<0.01						<0.01				0.02						
Phenolphthalein Alk																					
Phenols																					
PO4																					
Potassium																					
Selenium																					
Silver																					
Temp (degree C)																					
Total Solids																					
Zinc						190															
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	PADER	FAIRWAY	PADER	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	PADER	PADER	PADER	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

FAIRWAY = FAIRWAY LABORATORIES; LANC = LANCASTER LABORATORIES; MUS = MUS CORPORATION; PADER = PA DEPT. OF ENVIRONMENTAL RESOURCES; PENN = PENN ENVIRONMENTAL CONSULTANTS

NOTE: All parameters in mg/l unless otherwise stated.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

ARC035086

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ==>	J. STOTLER WELL				WELL M1-LINED																
ate ampled By	3-23-87 M & E	9-29-87 M & E	4-13-88 M & E	9-6-88 M & E	1-16-81 FAIRWAY	4-9-81 M & E	7-27-81 FAIRWAY	9-21-81 FAIRWAY	12-3-81 FAIRWAY	3-2-82 FAIRWAY	6-22-82 FAIRWAY	9-27-82 FAIRWAY	12-20-82 FAIRWAY	2-2-83 M & E	2-2-83 PADER	3-24-83 FAIRWAY	6-16-83 M & E	9-28-83 FAIRWAY	12-21-83 FAIRWAY	3-8-84 FAIRWAY	6-26-84 M & E
Aluminum	<0.1	<0.1	<0.1	0.16		0.04					<0.05			<0.1	0.05		<0.1				<0.1
Calcium	89	90	91	84										208							
Iron	0.3	0.13	0.13	0.2	13	11	0.43	8.5	8.4	16	0.11	13	17	26.6	23.6	0.45	33	0.12	2.9	17	0.23
Manganese	0.05	<0.05	<0.05	<0.05		2.5					2			2.31	2.05		3				<0.05
Magnesium	11	9.8	9.7	10										23.6							
Sodium	4.3	4.3	4.3	3.5																	
Fluoride	0.05	0.08	0.17	0.23		0.16					0.12						0.12				0.07
Total Phosphorus	<0.01	0.02	0.01	0.03																	
Nitrate-NO3	3	2.2	2.9	2.8		0.05					0.69			0.48	0.34		<0.05				0.06
Nitrite-NO2	<0.005	0.005	<0.005	<0.005		<0.002					0.005			<0.01	0.04		<0.002				<0.005
Chloride	12	11	9.9	10	35	40	33	31	34	20	26	42	41	47	55	22	38	35	18	16	33
Sulfate	33	42	46	42	34	20	38	32	31	36	32	12	24	20	25	31	16	33	42	34	31
B.O.D.	<1	1.6	1.9	<1.0	1.8	8.5	1.7	1.1	2.4	15	12	22	11	6.9	19	4.8	79	22	2	3.3	4.5
T Organic Carbon	132	4.4	<1	1		50					7.1			90.3	31		217				111
Alkalinity	215	210	218	198	538	509	534	527	517	564	570	579	577	510	520	507	694	541	633	653	568
Total Dissolved Solids	287	233	320	309	652	716	729	640	642	683	691	705	735	617		722	867	675	719	756	686
Ammonia-N	0.25	0.12	0.09	<0.04		0.33					0.38			0.47	1.43		0.85				0.7
Lead	<0.01	<0.005	<0.005	<0.005										<0.03	0.145						
Chromium	<0.01	<0.005	<0.005	<0.005										<0.01	0.02						
pH (units)	7.3	7.1	7.3	7.5	7	7.1	6.9	6.9	7.1	6.7	6.9	6.8	7.2	7.5	7	7.2	6.4	7	6.9	6.8	7.3
Specific Cond. (umhos/cm)	420	486	446	420	850	1238	1119	1075	1100	1144	1113	963	1056	1400	1100	1113	1175	1188	1138	1213	1050
Alb-N						0.28					0.22						0.28				0.29
Arsenic																					
Barium																					
Bromide																					
Cadmium														<0.005	0.004						
COD					5.3	63	8.8	4.8	11	3.6	7.9	<2	13	83	108	9.7	66	<2	3.3	10	23
Coliform (colonies/100ml)																					
Copper														0.02	0.02						
Fecal (colonies/100ml)																					
Hardness (CaCO3)																					
MBA's															0.004						
Mercury																					
Molybdenum																					
N - Kjeldahl														1.9	2.2						
Nickel														0.03	0.04						
Ortho Phosphate (P)						<0.01					<0.01						0.01				0.01
Phenolphthalein Alk																					
Phenols														<0.01							
PO4																					
Potassium																					
Selenium																					
Silver																					
Temp (degree C)						12															
Total Solids																					
Zinc														0.02	0.06						
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	NUS	PADER	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

FAIRWAY = FAIRWAY LABORATORIES; LANC = LANCASTER LABORATORIES; NUS = NUS CORPORATION; PADER = PA DEPT. OF ENVIRONMENTAL RESOURCES; PENN = PENN ENVIRONMENTAL CONSULTANTS

NOTE: All parameters in mg/l unless otherwise stated.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

AR303587

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	WELL M1-LINED											WELL M2-LINED		WELL M2-AREA IV							
Date Sampled By	9-24-84 FAIRWAY	12-20-84 M & E	3-21-85 FAIRWAY	9-18-85 M & E	3-23-86 M & E	3-25-86 M & E	9-23-86 M & E	3-23-87 M & E	10-15-87 M & E	4-13-88 M & E	9-6-88 M & E	2-1-83 M & E	10-3-85 M & E	2-1-83 M & E	9-19-85 M & E	3-25-86 M & E	9-23-86 M & E	3-23-87 M & E	9-30-87 M & E	4-13-88 M & E	9-6-88 M & E
Aluminum				0.28	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	0.1	<0.10	0.5	0.52	<0.1	<0.1	<0.1	<0.1	<0.1	0.21
Calcium				158	195	229	180	193	167	178	195	86	68	94.1	76	100	85	38	85	87	91
Iron	8.2	17	11	13	13	10	8.6	13	7.7	9.5	7.4	<0.01	0.23	0.25	1.1	0.14	<0.1	0.22	0.15	0.13	0.28
Manganese				1.8	2	2.2	1.8	2	1.7	1.7	1.7	0.02	0.19	<0.01	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05
Magnesium				18	18	17	19	18	17	17	19	181	14	10.6	10	11	12	11	12	9.6	12
Sodium				17	14	7.5	11	14	14	15	13		2.1		3.4	2.2	4	4.2	5.3	4.3	4.5
Fluoride				0.59	0.22	0.28	2	0.22	0.37	0.16	0.17		5.9		0.16	0.18	0.46	0.18	0.22	0.14	0.16
Total Phosphorus				<0.02	0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02		0.03		0.02	<0.02	<0.01	0.01	0.03	0.01	<0.02
Nitrate-NO3				7.2	1.1	1.3	<0.05	1.1	<0.05	<0.02	<0.02	0.46	0.28	1	6.3	1.8	1.5	1.9	1.5	1.6	1.5
Nitrite-NO2				<0.005	0.18	0.005	<0.005	0.18	<0.005	<0.005	<0.005	<0.01	0.02	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	35	36	23	47	35	19	47	35	54	50	47	23	20	12	14	9.4	14	11	14	7.9	12
Sulfate	44	38	63	59	87	89	48	87	49	52	43	87	160	36	47	48	26	27	36	40	40
B.O.D.	1.1	7.7	13	16	27	2.5	2	27	15	10	4.1	<1	3.4	<1	1.5	<1	<1	2.3	4.9	1.6	<1
T Organic Carbon				5.4	161	92.8	3.9	161	6.6	6	6	45.8	2.1	46.4	<1	2.9	<1	66	3.4	1	4
Alkalinity	543	513	571	421	573	589	481	573	461	479	458	141	141	191	210	237	220	225	234	227	216
Total Dissolved Solids	672	690	684	614	665	707	629	665		626	635	313	344	298	289	307	298	286	332	296	339
Ammonia-N				0.45	1.8	0.19	0.58	1.8	0.23	0.96	0.25	0.36	0.29	0.18	0.23	0.1	0.23	0.24	0.02	0.07	0.12
Lead					0.01			<0.01	<0.005	<0.005	0.006			<0.03				<0.01	<0.005	<0.005	
Chromium					0.01			<0.01	<0.005	<0.005	<0.005	<0.01		<0.01				<0.01	<0.005	<0.005	
pH (units)	6.8	6.8	6.7	6.9	7.2	6.8	7.2	7.2	6.9	7.1	6.8	7.5	7.2	7.6	7.7	7.5	7.8	7.5	7.4	7.5	7.5
Specific Cond. (umhos/cm)	1044	925	1025	925	711	963	928	711	855	894	823	470	435	490	489	486	508	307	487	440	444
Alb-N																					
Arsenic																					
Barium																					
Bromide																					
Cadmium												<0.005		<0.005							
COD	7.7	12	5.9					0.01				50		8							
Coliform (colonies/100ml)																					
Copper												<0.01		0.01							
Fecal (colonies/100ml)																					
Hardness (CaCO3)																					
MBA's																					
Mercury																					
Molybdenum																					
N - Kjeldahl												0.41		<0.10							
Nickel												<0.03		<0.03							
Ortho Phosphate (P)																					
Phenolphthalein Alk																					
Phenols												<0.02		<0.02							
PO4																					
Potassium																					
Selenium																					
Silver																					
Temp (degree C)																					
Total Solids								665	636												
Zinc												0.02		0.01							
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	NUS	FAIRWAY	NUS	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

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MEISER & EARL, INC. / Hydrogeologists

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STATE COLLEGE, PA 16801

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	WEST FLOW				EAST FLOW		WELL 4-79														
Date	2-16-84	11-1-84	5-7-85	9-19-85	2-16-84	5-7-85	6-13-79	11-20-79	2-21-80	6-10-80	9-10-80	1-16-81	4-27-81	7-27-81	9-21-81	12-3-81	3-2-82	6-22-82	9-27-82	12-20-82
Sampled By	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY
Aluminum	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	1.6			0.4			0.1					0.16		
Calcium	85.1	36.8	83.5	88	29.1	88.6														
Iron	0.33	0.08	0.18	0.38	0.14	0.66	4.44	21.6	42	18	22	16	27	6.23	24	0.24	0.43	0.33	0.25	0.08
Manganese	0.132	0.116	0.106	0.39	0.68	0.257	1.77			2.5			3.9					1.8		
Magnesium	23.1	56.9	50.3	52	4.99	20.7														
Sodium	76.9	290	196	235	13.1	32.8														
Fluoride	<2	<4	<2	0.42	<4	<2	<0.1			<0.02			0.14					0.16		
Total Phosphorus				0.04																
Nitrate-NO3	37	20	11	35	<2	<1	0.03			0.2			3					5.3		
Nitrite-NO2	<1	12	<1	0.9	<2	<1	0.001			0.002			<0.002					0.11		
Chloride	260	419	194	462	59	64	71	147	100	45	118	147	89	513	36	450	162	177	155	152
Sulfate	232	40	26	<2	100	190	24	133	76	52	77	316	67	62	48	73	49	105	31	82
B.O.D.	9	13	<6	64	83	<6	13	2	12	19	20	120	33	26	39	18	14	2.2	3.6	2
T Organic Carbon	38		63	66.3	50	16							17					21		
Alkalinity	521	690	792	582	91	143	36	64	55	75	205	280	73	96	259	252	157	133	288	99
Total Dissolved Solids	1710	1530	1290	1543	317	544			608	311	700	714	380	1289	1078	1201	560	682	683	509
Ammonia-N	42.7	55.8	75	43	<2.5	<1	0.05			1.7			0.95					1.8		
Lead	<0.05	<0.05	<0.05			<0.05														
Chromium	<0.05	<0.05	<0.05			<0.05														
pH (units)	8.05	7.69	8.01	7.6	7.1	7.9	6.2	6.1	5.7	6.3	6.1	6.6	6.1	6.5	6.6	6.8	6.6	6.5	6.7	6.5
Specific Cond. (umhos/cm)				2375			356	500	420	306	838	860	644	1688	1263	2625	950	1175	1038	825
Alb-N							0.09			1.8			0.37					0.83		
Arsenic	<0.004				<0.004															
Barium	0.237	0.161	0.423		0.023	0.043														
Bromide	<5	<10	<5		<10	<5														
Cadmium	<0.005	<0.005	<0.005		<0.005	<0.005														
COD	28	209			136		93	43	127	72	181	205	45	102	188	92	50	55	114	28
Coliform (colonies/100ml)																				
Copper	<0.05	<0.05	<0.05			<0.05														
fecal (colonies/100ml)																				
Hardness (CaCO3)																				
MBA's							0.07			0.011										
Mercury	<0.001				<0.001															
Molybdenum	<0.05	<0.05	<0.05		<0.05	<0.05														
N - Kjeldahl																				
Nickel	<0.05	<0.05	<0.05			<0.05														
Ortho Phosphate (P)	<10	<20	<10		<20	<10				<0.01			<0.01					<0.01		
Phenolphthalein Alk	<1	<1	<1		<1	<1														
Phenols																				
PO4							0.01													
Potassium	45.4	37.9	92		4.8	12.7														
Selenium	<0.004				<0.004															
Silver	<0.05	<0.05	<0.05		<0.05	<0.05														
Temp (degree C)																				
Total Solids																				
Zinc	<0.05	<0.05	<0.05		<0.05	<0.05														
Laboratory	LANC	LANC	LANC	FAIRWAY	LANC	LANC	PEC	PEC	PEC	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

FAIRWAY = FAIRWAY LABORATO RIES; LANC = LANCASTER LABORATORIES; NUS = NUS CORPORATION; PADER = PA DEPT. OF ENVIRONMENTAL RESOURCES; PENN = PENN ENVIRONMENTAL CONSULTANTS

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MEISER & EARL, INC. / Hydrogeologists
1512 W. COLLEGE AVE.
STATE COLLEGE, PA 16801

AR303589

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name <<<<	WELL 6-79													WELL 5-79							
Date Sampled By	2-1-83 PADER	3-24-83 FAIRWAY	6-15-83 M & E	9-28-83 FAIRWAY	12-21-83 FAIRWAY	3-8-84 FAIRWAY	6-26-84 FAIRWAY	9-24-84 FAIRWAY	12-20-84 FAIRWAY	3-21-85 FAIRWAY	9-18-85 M & E	3-25-86 M & E	3-24-87 M & E	6-13-79 M & E	2-21-80 M & E	6-10-80 FAIRWAY	9-10-80 FAIRWAY	1-16-81 FAIRWAY	4-27-81 FAIRWAY	9-21-81 FAIRWAY	10-2-85 M & E
Aluminum			<0.1				<0.1				0.12	<0.1	<0.1	26.7					0.18		0.16
Calcium											34	38	41								37
Iron	30	0.11	12	37	<0.05	0.16	20	0.2	0.25	0.3	26	9.8	29	31.4	1.92		0.1	0.36	0.41	0.33	2.4
Manganese	30		2.8				4.4				4.8	2.5	15	3.6					0.78		0.67
Magnesium											8	9	9.5								4.3
Sodium											30	21	18								5.8
Fluoride			0.07				0.24				0.06	0.06	0.09	<0.1					0.19		0.18
Total Phosphorus											<0.02	<0.02	<0.01								<0.01
Nitrate-NO3	0.4		<0.05				0.32				3.5	0.62	0.07	0.61					2.9		2.3
Nitrite-NO2	0.044		<0.002				<0.005				<0.005	0.01	<0.005	0.005					0.003		<0.005
Chloride	26	75	95	95	52	47	68	67	42	41	69	69	18	100	5.2		11	24	8.3	11	22
Sulfate	65	81	58	38	52	145	98	86	94	95	58	57	46	3.6	2.9		2.6	15	6	5	7.7
B.O.D.	2	1.2	1.9	17	<1	3	1.9	3	2.6	1.6	5.6	1.9	7.9	4.2	1.8		6.2	2.3	2.8	2.1	2.7
T Organic Carbon	6.7		73.6				68.9				8.8	5.8	52						3		2.5
Alkalinity	146	114	118	343	108	153	134	215	129	139	93	91	145	54	85	145	99	136	73	29	97
Total Dissolved Solids	288	405	405	658	390	434	478	414	372	332	302	303	298		172		182	215	105	89	153
Ammonia-N	0.01		1.4				1.2				1	0.41	0.88	0.07					0.4		0.51
Lead	70.5												<0.01								
Chromium	10												<0.01								
pH (units)	7.6	6.8	5.9	6.6	6.6	6.5	6.7	6.4	6.5	6.6	6.8	7.1	6.7	6.5	6.3	6.7	6.6	7.1	6.9	6.4	6.6
Specific Cond. (umhos/cm)	190	650	584	1056	619	688	744	725	528	540	521	459	450	60	120	238	263	353	188	144	246
Alb-N			0.5				0.41							0.52					0.21		
Arsenic																					
Barium																					
Bromide																					
Cadmium																					
COD	28	21	30	181	20	14	35	83	32	20				186	98		32	16	11	<2	
Coliform (colonies/100ml)																					
Copper	30																				
Fecal (colonies/100ml)																					
Hardness (CaCO3)	246																				
MBA's														0.01							
Mercury																					
Molybdenum																					
N - Kjeldahl	0.55																				
Nickel	10																				
Ortho Phosphate (P)			<0.01				0.01												<0.01		
Phenolphthalein Alk																					
Phenols	0																				
PO4														0.016							
Potassium																					
Selenium																					
Silver																					
Temp (degree C)																					
Total Solids																					
Zinc	50																				
Laboratory	PADER	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	PADER	PADER	PADER	FAIRWAY	FAIRWAY	FAIRWAY	PEC	PEC	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

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MEISER & EARL, INC. / Hydrogeologists
1512 W COLLEGE AVE.
STATE COLLEGE, PA 16801

R303590

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	WELL 5-79				WELL 6-85							WELL 7-85						WELL 8-85		
Date	9-23-86	9-29-87	4-13-88	9-6-88	9-18-85	3-25-86	9-23-86	3-23-87	10-15-87	4-14-88	9-6-88	9-18-85	3-25-86	9-23-86	3-23-87	10-15-87	9-6-88	9-18-85	3-25-86	9-23-86
Sampled By	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E
Aluminum	0.12	0.16	0.2	0.22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	0.12	0.16	<0.1	<0.1	<0.1	0.14	0.25	<0.1	<0.1
Calcium	24	50	98	57	150	221	308	193	193	209	206	130	163	141	158	147	154	175	194	187
Iron	1.2	3.9	1.3	4.8	0.77	4.4	0.81	3.6	3.5	6.8	4.7	21	21	20	24	19	19	0.45	0.17	<0.1
Manganese	0.39	0.06	0.74		0.86	2.3	1.1	1.7	1.6	1.8	1.8	0.78	0.87	0.69	0.79	0.97	0.73	0.05	0.09	<0.05
Magnesium	3	5	5.9	5.8	24	31	58	35	32	31	33	24	28	26	25	25	26	19	16	16
Sodium	5	9.5	22	12	12	6.5	10	16	15	13	9.6	54	42	35	47	42	34	8.8	6.5	9.3
Fluoride	0.95	0.09	0.14	0.05	2.6	0.25	3.6	0.15	1.8	0.05	0.09	0.38	0.25	0.96	0.15	0.54	0.09	4	9.4	1.7
Total Phosphorus	0.07	<0.01	0.02	0.04	0.05	<0.02	<0.01	<0.01	<0.01	<0.01	0.04	<0.02	<0.02	<0.01	<0.01	<0.01	<0.02	0.02	<0.02	<0.01
Nitrate-NO3	0.45	0.2	0.27	0.48	8.8	1.9	0.22	0.23	0.17	<0.02	0.17	0.44	1.6	0.08	0.05	0.1	<0.02	11	6.8	4.2
Nitrite-NO2	0.005	<0.005	<0.005	0.005	0.012	0.01	0.014	0.023	0.014	<0.005	0.007	<0.005	0.96	<0.005	<0.005	<0.005	<0.005	0.008	0.01	0.009
Chloride	19	31	34	33	28	22	29	31	30	2.5	<0.05	112	109	82	74	77	69	37	19	34
Sulfate	2.5	9.2	13	16	27	34	16	18	39	24	31	4.3	12	3.9	14	11	13	111	114	68
B.O.D.	<1	3.4	5.8	3.6	2.3	1.7	2.1	2.7	3.2	6	<1.0	17	21	19	17	35	15	1.7	<1	<1
T Organic Carbon	11.1	5.9	3	4	4.3	11.5	2.6	155	6.3	3	14	3.8	15.5	10.5	172	15.4	23	2.4	4.2	1.8
Alkalinity	64	188	289	146	520	652	589	630	641	666	623	461	547	476	556	491	482	403	434	456
Total Dissolved Solids	139	273	370	267	586	719	642	676	710	720	705	655	742	615	670	655	547	662	650	682
Ammonia-N	0.37	0.62	0.43	0.53	0.22	0.24	0.35	0.48	0.57	0.78	0.45	5.2	5.3	4.3	4.2	2.7	3.5	0.17	0.05	0.24
Lead		<0.005	<0.005	<0.005				<0.01	<0.005	<0.005	0.0061				<0.01	<0.005	<0.005			
Chromium		<0.005	<0.005	<0.005				<0.01	<0.005	<0.005	<0.005				<0.01	<0.005	<0.005			
pH (units)	6.4	6.6	6.8	6.7	7.2	6.9	6.9	6.8	6.9	7.1	6.8	7	7	7.1	6.9	6.9	7	7.1	7.1	7.1
Specific Cond. (umhos/cm)	196	447	545	353	919	1050	1000	717	1066	1010	929	1106	1156	1046	895	987	909	919	881	961
Alb-N																				
Arsenic																				
Barium																				
Bromide																				
Cadmium																				
COD																				
Coliform (colonies/100ml)																				
Copper																				
Fecal (colonies/100ml)																				
Hardness (CaCO3)																				
MBA's																				
Mercury																				
Molybdenum																				
N - Kjeldahl																				
Nickel																				
Ortho Phosphate (P)																				
Phenolphthalein Alk																				
Phenols																				
PO4																				
Potassium																				
Selenium																				
Silver																				
Temp (degree C)																				
Total Solids																				
Zinc																				
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

FAIRWAY = FAIRWAY LABORATORIES; LANC = LANCASTER LABORATORIES; NUS = NUS CORPORATION; PADER = PA DEPT. OF ENVIRONMENTAL RESOURCES; PENN = PENN ENVIRONMENTAL CONSULTANTS

NOTE: All parameters in mg/l unless otherwise stated.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

AR303591

A-3

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ==>	WELL 8-85				TRANSFER STATION WELL
Date	3-23-87	10-15-87	4-13-88	9-6-88	9-6-88
Sampled By	M & E	M & E	M & E	M & E	M & E
Aluminum	<0.1	<0.1	<0.1	0.18	0.15
Calcium	185	194	182	203	61
Iron	0.27	0.2	0.15	0.2	2.7
Manganese	0.09	0.05	0.05	<0.05	0.18
Magnesium	17	16	17	18	4.6
Sodium	12	13	14	12	2.8
Fluoride	0.16	0.27	0.22	0.11	0.25
Total Phosphorus	0.05	0.39	1.4	0.63	<0.02
Nitrate-NO3	4.5	2.7	2.7	3.2	<0.02
Nitrite-NO2	0.029	<0.005	<0.005	<0.005	<0.005
Chloride	31	41	38	33	6.9
Sulfate	71	84	86	91	32
B.O.D.	1.6	1.0	2.1	<1.0	<1.0
T Organic Carbon	66	6.6	2	6	2
Alkalinity	514	466	443	451	149
Total Dissolved Solids	660	694	658	673	217
Ammonia-N	0.17	0.04	0.69	0.04	0.04
Lead	<0.01	<0.005	<0.005	<0.005	<0.005
Chromium	<0.01	<0.005	<0.005	<0.005	<0.005
pH (units)	7	7.1	6.9	7.2	6.8
Specific Cond. (umhos/cm)	776	914	838	869	285
Alb-N					
Arsenic					
Barium					
Bromide					
Cadmium					
COD					
Coliform (colonies/100ml)					
Copper					
Fecal (colonies/100ml)					
Hardness (CaCO3)					
MBA's					
Mercury					
Molybdenum					
N - Kjeldahl					
Nickel					
Ortho Phosphate (P)					
Phenolphthalein Alk					
Phenols					
PO4					
Potassium					
Selenium					
Silver					
Temp (degree C)					
Total Solids					
Zinc					
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY

KEY / LEGEND

FAIRWAY = FAIRWAY LABORATORIES; LANC = LANCASTER LABORATORIES; NUS = NUS CORPORATION; PADER = PA DEPT. OF ENVIRONMENTAL RESOURCES; PENN = PENN ENVIRONMENTAL CONSULTANTS

NOTE: All parameters in mg/l unless otherwise stated.

150 030592

MEISER & EARL, INC. / Hydrogeologists
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STATE COLLEGE, PA 16801

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name ===>	CARACCIOLO WELL		GILBERT WELL			HOLLINGS-HEAD WELL	JONES WELL	LEHMAN WELL	NAIL WELL		OLD TRAILER WELL	RODKEY			G. STOTLER	WELL 2				
Date	4-8-81	11-4-85	6-21-79	9-21-82	11-4-85	11-4-85	11-4-85	11-4-85	4-8-81	11-4-85	6-13-79	6-21-79	4-27-81	11-4-85	11-4-85	6-13-79	11-20-79	2-21-80	6-11-80	9-10-80
Sampled By	M & E	M & E	M & E	PADER	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	M & E	FAIRWAY	FAIRWAY
Aluminum		<0.1	<0.1	0.03	<0.1	<0.1	<0.1	<0.1		<0.1	2.1	<0.1	0.2	<0.1	<0.1	1.1			0.08	
Calcium		60			7.2	2.4	21	59		75				31	87					
Iron		2.1	5.11	8.17	7.5	0.23	4.4	13		6.7	15.3	6.1	6.3	9.3	0.18	11.7	27.4	22.7	14	0.3
Manganese		0.2	0.11	0.1	0.14	0.07	0.11	0.39		0.22	1.11	0.59	0.5	0.44	0.07	0.37			0.46	
Magnesium		3.4			1.6	0.49	1.6	4.3		5.4				3.1	10					
Sodium		1.5			1	0.75	0.75	4.1		7.2				1.9	4					
Fluoride		0.07	<0.01		<0.05	<0.05	0.13	0.1		0.1	0.23	0.11	0.16	0.11	0.12	<0.1			0.05	
Total Phosphorus		<0.05			<0.05	<0.05	<0.05	<0.05		<0.05				<0.05	<0.05					
Nitrate-NO3		4.7	3.2	0.66	0.3	0.69	5.4	0.06		0.33	0.1	0.03	0.09	1	3.4	0.07			0.2	
Nitrite-NO2		0.017	0.002	0.004	0.008	0.056	0.017	<0.005		<0.005	0.009	0.016	0.003	0.56	0.007	0.002			0.002	
Chloride		13	2.1	2	1.7	<2	0.25	40		53	29	8.4	11	9.5	20	42	42	44	24	23
Sulfate		58	5.1	5	6.8	<2	31	50		45	120	8.4	7	15	45	21	18	4.8	19	4.2
B.O.D.		<1	<1	0.6	<1	<1	<1	1.8		<1	6	<1	18	<1	<1	6.4	2	<1	6	17
T Organic Carbon		<1		<1	<1	<1	<1	<1		<1			3	<1	<1					
Alkalinity		117	20	24	26	5.1	45	103		129	52	108	103	91	203	9	27	31	50	23
Total Dissolved Solids	168	211			34	15	82	284	351	344			126	119	313			128	164	129
Ammonia-N		0.18	0.05	0.88	0.16	0.17	0.18	0.24		0.22	0.24	0.06	0.26	0.35	0.23	<0.02			0.5	
Lead				0.003																
Chromium				<.01																
pH (units)		7.2	6.5	6	6.3	5.6	6.5	6.6		7	6.3	7.4	7	6.6	7	4.4	6.1	6.1	6.7	6.2
Specific Cond. (umhos/cm)		324	63	65	74	25	131	413		513	437	226	246	223	531	211	173	140	155	128
Alb-N			0.79								0.27	0.28	0.2			0.07			0.84	
Arsenic																				
Barium																				
Bromide																				
Cadmium				<.0002																
COD			8	14							186	8	11			279	12	127	18	6
Coliform (colonies/100ml)																				
Copper				0.02																
Fecal (colonies/100ml)																				
Hardness (CaCO3)				24																
MBA's			0.18								0.05	0.03				0.02			0.01	
Mercury																				
Molybdenum																				
N - Kjeldahl																				
Nickel																				
Ortho Phosphate (P)													0.01						<0.01	
Phenolphthalein Alk																				
Phenols																				
PO4			0.003								0.003	0.005				0.006				
Potassium																				
Selenium																				
Silver																				
Temp (C degree)																				
Total Solids																				
Zinc				0.02																
Laboratory	FAIRWAY	FAIRWAY	PEC	PADER	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	PEC	PEC	FAIRWAY	FAIRWAY	FAIRWAY	PEC	PEC	PEC	FAIRWAY	FAIRWAY

KEY / LEGEND

FAIRWAY = FAIRWAY LABORATORIES; LANC - LANCASTER LABORATORIES; MUS = MUS CORPORATION; PADER = PA DEPT. OF ENVIRONMENTAL RESOURCES; PENN = PENN ENVIRONMENTAL CONSULTANTS

NOTE: All parameters in mg/l unless otherwise noted.

MEISER & EARL, INC. / Hydrogeologists
1512 W COLLEGE AVE.
STATE COLLEGE, PA 16801

A-2

DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL - SUMMARY OF ANALYTICAL RESULTS

Well Name -->	WELL 2																		WELL M2-LINED		L
Date	1-16-81	4-27-81	7-27-81	9-21-81	12-3-81	3-2-82	6-22-82	9-27-82	12-20-82	3-24-83	6-15-83	9-28-83	12-21-83	3-8-84	6-26-84	9-24-84	12-20-84	3-21-85	2-1-85	10-3-85	6-13-7
Sampled By	FAIRWAY	M & E	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	M & E	FAIRWAY	FAIRWAY	FAIRWAY	M & E	FAIRWAY	FAIRWAY	FAIRWAY	M & E	M & E	M & E
Aluminum		0.18					<0.05				<0.1				<0.1				0.1	<1.0	0.5
Calcium																			86	68	
Iron	5.3	1.9	10.37	1.8	0.03	3.4	0.13	0.1	0.04	0.16	5.9	0.23	0.07	0.09	8.8	4.7	6.5	9.3	<0.01	0.23	1.25
Manganese		0.37					0.07				0.54				0.26				0.02	0.19	1.12
Magnesium																			181	14	
Sodium		0.12																		2.1	
Fluoride							0.14				0.08				0.15					0.18	0.22
Total Phosphorus		0.29																		0.03	
Nitrate-NO3		<0.002					0.11				<0.05				0.09				0.44	0.28	0.45
Nitrite-NO2							0.004				<0.002				<0.005				<0.01	0.02	0.041
Chloride	27	32	35	41	28	47	18	24	29	25	44	46	21	29	36	33	28	32	23	20	73
Sulfate	<1.5	20	5.3	2.5	2.4	34	<1.5	<1.5	<1.5	4	26	5.6	13	4.9	13	4.4	8.5	3.2	87	140	170
B.O.D.	35	2	<1	2.7	2.2	1.4	1.8	1.1	1.6	1.4	<1	1.6	<1	2	<1	<1	1.8	1.1	<1	3.4	13
T Organic Carbon		<1					6				9.84				11.8				45.8	2.1	
Alkalinity	25	5.9	24	29	22	83	40	17	21	40	20	30	53	49	22	40	38	52	141	141	169
Total Dissolved Solids	84	123	151	123	65	231	74	91	85	93	194	141	122	160	162	120	143	106	313	344	
Ammonia-N		0.13					0.31				0.24				0.19				0.36	0.29	0.57
Lead																			<0.03		
Chromium																			<0.01		
pH (units)	6.9	6	6.3	6.2	6.6	6.4	6.8	6.5	6.5	6.7	5.8	6.5	6.8	6.6	6.4	6.5	6.6	7	7.5	7.2	7.5
Specific Cond. (umhos/cm)	133	219	205	199	155	409	134	111	129	155	185	250	163	199	160	185	200	184	470	435	835
Alb-N		0.2					0.18				0.33				0.18						0.53
Arsenic																					
Barium																					
Bromide																					
Cadmium																			<0.005		
COD	3.5	9.5	<2	<2	<2	14	7.9	<2	5.9	5.8	<2	<2	5	38	5.3	3.9	9.9	<2	50		93
Coliform (colonies/100ml)																					
Copper																			<0.01		
Fecal (colonies/100ml)																					
Hardness (CaCO3)																					
MBA's																					0.1
Mercury																					
Molybdenum																					
N - Kjeldahl																			0.41		
Nickel																			<0.03		
Ortho Phosphate (P)		<0.01					<0.01				<0.01				0.01						
Phenolphthalein Alk																					
Phenols																			<0.02		
PO4																					0.005
Potassium																					
Selenium																					
Silver																					
(degree)																					
Solids																					
																			0.02		
Laboratory	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	FAIRWAY	NUS	FAIRWAY	PEC

KEY / LEGEND

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NOTE: All parameters in mg/l unless otherwise noted.

MEISER & EARL, INC. / Hydrogeologists

1512 W. COLLEGE AVE.

STATE COLLEGE, PA 16801

R303594

A-23

ER-LAB-13.1
7/83

1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number OPer-3433
Date Received 6/18/86 A-24

ENVIRONMENT	CASE	FACILITY	COLL NUMBER
Old Stotler Landfill			

COUNTY	MUNICIPALITY	PROGRAM	COLL NAME/PHONE NUMBER	TYPE TR	STD ANALYSIS
Blair	Logan	WQ	A Kline 814-946-7290	0	

CARD (3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-28	KIND 29
1 / 2	Cnty Mun T Est Case Fac.		0	M 06 D 17 Y 86	Hr 10 Min 23	1

USGS Q 30 34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		0333639		

FULL DESCRIPTION WHERE SAMPLE TAKEN: Culvert pipe at wetlands outlet btw STP sludge lagoons

ADDITIONAL LAB ANALYSES

VOA analysis

Dave Clemens

CUSTODY LOG

Now Shipped Puralator Date 6/17/86
Legal Seal No. 294321
Received by:
Legal Seal Condition: intact Skar

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

DER
WATER QUALITY MANAGEMENT
JUN 25 1986
HARRISBURG REGION

GC/MS detection limit ~ 1.0 ug/l

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
1,2 Dichloroethylene	ug/l		16.
1,1,1 Trichloroethane	ug/l		8.0
Trichloroethylene	ug/l		8.5
Tetrachloroethylene	ug/l		14.

ANALYST Susan C Kar
SIGNATURE
DATE 6/19/86

AR303595

ER-LAB-13.1
/83

1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number CRG-3434

Date Received 6/18/86

A-2

ES	NT	CASE	FACILITY	COLL NUMBER
O	Stotler Landfill			

COUNTY	MUNICIPALITY	PROGRAM	COLL NAME/PHONE NUMBER	TYPE TR	STD ANALYSIS
Blair	Logan	WQ	AKline 814-946-7290	O	

CARD (3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-29	KIND 29
1 / 2	Cnty Mun T Est Case Fac.		0	M D Y 06 17 86	Hr Min 10 42	1

USGS Q 30 34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-52	RELATIVE POINT 58
		0333640		

ULL DESCRIPTION WHERE SAMPLE TAKEN: seep#1 75' N of FAM Spring

CUSTODY LOG

ow Shipped Purolator Date 6/17/86

egal Seal No. 294320

eceived by:

egal Seal Condition: intact SKar

ADDITIONAL LAB ANALYSES

VOA

Dave Clemens

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

DER
WATER QUALITY MANAGEMENT
JUN 25 1986
HARRISBURG REGION

GCMS detection limit ~ 1.0 ug/l

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
Chloroethane	ug/l		~ 9.0
1,1 Dichloroethane	ug/l		9.0
1,2 Dichloroethylene	ug/l		650.
1,1,1 Trichloroethane	ug/l		150.
Trichloroethylene	ug/l		100.
Tetrachloroethylene	ug/l		55.

DER
WATER QUALITY MANAGEMENT
JUN 30 1986
HARRISBURG REGION

ANALYST Susan C Kar
SIGNATURE

DATE 6/20/86

AR303596

R-LAB-13.1
'83

1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number CYCl2-3435
Date Received 6/18/86

A-2

S...	CASE	FACILITY	COLL NUMBER
Stotler Landfill			

OUNTY	MUNICIPALITY	PROGRAM	COLL NAME/PHONE NUMBER	TYPE TR	STD ANALYSIS
Blair	Logan	WQ	A Kline 814-946-7290	0	

CARD (3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-29	KIND 29
1 / 2	Cnty Mun T Est Case Fac.		0	M 06 D 17 Y 86	Hr 11 Min 00	1

USGS Q 30 34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		0 3 3 3 6 4 1		

ULL DESCRIPTION WHERE SAMPLE TAKEN: Seep #2 down the bank from Pole #101 BTCo of Pa 3-34492

ADDITIONAL LAB ANALYSES: VOA analysis, Dave Clemens

CUSTODY LOG
ow Shipped Purolator Date 6/17/86
gal Seal No. 294319
ceived by:
gal Seal Condition: intact SKar

QUALITATIVE REPORT

DER
WATER QUALITY MAN...
JUN 2 5 1986
HARRISB...

DO NOT WRITE BELOW THIS LINE

GC/MS detection limit - 1.0 ug/l

QUANTITATIVE RESULTS

ALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
1,1 Dichloroethane	ug/l		36
1,2 Dichloroethylene	ug/l		200
1,1,1 Trichloroethane	ug/l		75
Trichloroethylene	ug/l		95
Tetrachloroethylene	ug/l		27

DER
WATER QUALITY MANAGEMENT
JUN 30 1986
HARRISBURG REGION

ANALYST Susan C. Kar
...NATURE

DATE 6/20/86

AR303597

ER-LAB-13.1
7/83

1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number GRCn-3436
Date Received 6/18/86 A-2

ES MENT	CASE	FACILITY	COLL NUMBER
Old Stotler Landfill			

COUNTY	MUNICIPALITY	PROGRAM	COLL NAME/PHONE NUMBER	TYPE TR	STD ANALYSIS
Blair	Logan	WQ	A Kline 814-946-7290	0	

CARD (3) 1/2	ID CODE (ALL CARDS) 4-16 Cnty Mun T Est Case Fac.	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24 M D Y	TIME 25-28 Hr Min	KIND 29
			0	06 17 86	11 10	1

USGS Q 30 34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		0 3 3 3 6 4 2		

FULL DESCRIPTION WHERE SAMPLE TAKEN: Seep #3 30' downstream (North) from Seep #2

ADDITIONAL LAB ANALYSES: VOA

Dave Clemens

CUSTODY LOG

How Shipped Purolator Date 6/17/86
Legal Seal No. 294318
Received by:
Legal Seal Condition: intact Skar

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

DER
WATER QUALITY MANAGEMENT
JUN 25 1986
HARRISBURG REGION

GC/MS detection limit ~ 1.0 ug/l

QUANTITATIVE RESULTS

ANALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
1,1 Dichloroethane	ug/l		8.0
1,2 Dichloroethylene	ug/l		7.2
1,1,1 Trichloroethane	ug/l		9.6
Trichloroethylene	ug/l		5.3
Tetrachloroethylene	ug/l		5.7
Toluene	ug/l		2.2

DER
WATER QUALITY MANAGEMENT
JUN 30 1986
HARRISBURG REGION

ANALYST Susan L Kar
SIGNATURE

DATE 6/20/86

AR303598

ER-LAB-13.1
/83

1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number CrCr-3437
Date Received 6/16/86

A-2

ES ENT	CASE	FACILITY	COLL NUMBER
d Stotler Landfill			

COUNTY	MUNICIPALITY	PROGRAM	COLL NAME/PHONE NUMBER	TYPE TR	STD ANALYSIS
Blair	Logan	WQ	AKline 814 946-7290	0	

CARD (3) 1/2	ID CODE (ALL CARDS) 4-16 Cnty Mun T Est Case Fac.	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24 M D Y	TIME 25-28 Hr Min	KIND 29
			0	06 17 86	11 15	1

USGS Q 30 34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		0 3 3 3 6 4 3		

ULL DESCRIPTION WHERE SAMPLE TAKEN: seep #4 25' North of seep #3

ADDITIONAL LAB ANALYSES
VOA
Dave Clemens

CUSTODY LOG
ow Shipped Purolator Date 6/17/86
gal Seal No. 294317
eceived by:
gal Seal Condition: intact Skar

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

DER
WATER QUALITY MANAGEMENT
JUN 2 5
HARRISBURG

Collins detection limit ~10 ug/l

QUANTITATIVE RESULTS

ALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
1,2 Dichloroethylene	ug/l		10.
1,1,1 Trichloroethane	ug/l		80.
Trichloroethylene	ug/l		17.
Tetrachloroethylene	ug/l		170.

ANALYST Susan C Kar
SIGNATURE
DATE 6/20/86

AR303599

R-LAB-13.1
83

1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number CRCR-3438

Date Received 6/18/86

A-2

...NT	CASE	FACILITY	COLL NUMBER
Old Stotler Landfill			

...OUNTY	MUNICIPALITY	PROGRAM	COLL NAME/PHONE NUMBER	TYPE TR	STD ANALYSIS
Blair	Logan	WQ	AKline 814-946-7290	0	

CARD (3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-29	KIND 29
1 / 2	Cnty Mun T Est Case Fac.		0	M D Y 06 17 86	Hr Min 11 20	1

...SGS O 30 34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		0 3 3 3 6 4 4		

...LL DESCRIPTION WHERE SAMPLE TAKEN: Seep #5 8' N of Seep #4 under concrete slab

ADDITIONAL LAB ANALYSES

VOA

Dave Clemens

CUSTODY LOG

...w Shipped Purolator Date 6/17/86

...gal Seal No. 294316

...ceived by:

...gal Seal Condition: intact SKar

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

DER
WATER QUALITY MANAGEMENT
JUN 25 1986
HARRISBURG REGION

GCMS detection limit ~ 1.0 ug/l.

QUANTITATIVE RESULTS

...NALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
1,1 Dichloroethane	ug/l		2.0
1,2 Dichloroethylene	ug/l		10.
1,1,1 Trichloroethane	ug/l		20.
Trichloroethylene	ug/l		7.8
Tetrachloroethylene	ug/l		27.

DER
WATER QUALITY MANAGEMENT
JUN 30 1986
HARRISBURG REGION

ANALYST Susan C. Kar DATE 6/20/86
SIGNATURE

AR303600

R-LAB-13.1
/83

1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF LABORATORIES
SPECIAL ANALYSES REPORT

Lab Number CRCu-3439
Date Received 6/18/86

A-3

S NT	CASE	FACILITY	COLL NUMBER
Stotler Landfill			

OUNTY	MUNICIPALITY	PROGRAM	COLL NAME/PHONE NUMBER	TYPE TR	STD ANALYSIS
Blair	Logan	WQ	A Kline 814-946-7290	0	

CARD (3)	ID CODE (ALL CARDS) 4-16	LATITUDE 4-10	LONGITUDE 11-18	DATE 19-24	TIME 25-28	KIND 29
1 / 2	Cnty Mun T Est Case Fac.		0	M 06 D 17 Y 86	Hr 11 Min 30	1

USGS Q 30 34	BUREAU 35-37 AMIS	SAMPLE NUMBER 38-43	STREAM NAME 44-57	RELATIVE POINT 58
		0 3 3 3 6 4 5		

ULL DESCRIPTION WHERE SAMPLE TAKEN: Seep #6 down the bank from BTC of PA pole #3-34491 102

ADDITIONAL LAB ANALYSES
VOA
Dave Clemens

CUSTODY LOG
w Shipped Purolator Date 6/17/86
gal Seal No. 294315
ceived by:
gal Seal Condition: intact SKar

QUALITATIVE REPORT

DO NOT WRITE BELOW THIS LINE

DER
WATER QUALITY MANAGEMENT
JUN 25 1986
HARRISBURG REGION

GCMS detection limit ~1.0 ug/l

QUANTITATIVE RESULTS

ALYSIS:	UNITS:	ANALYSIS CODE	RESULTS (SHOW DECIMAL POINTS ON LINES)
1,1 Dichloroethane	ug/l		3.8
1,2 Dichloroethylene	ug/l		110.
1,1,1 Trichloroethane	ug/l		23.
Trichloroethylene	ug/l		22.
Tetrachloroethylene	ug/l		19.

DER
WATER QUALITY MANAGEMENT
JUN 30 1986
HARRISBURG REGION

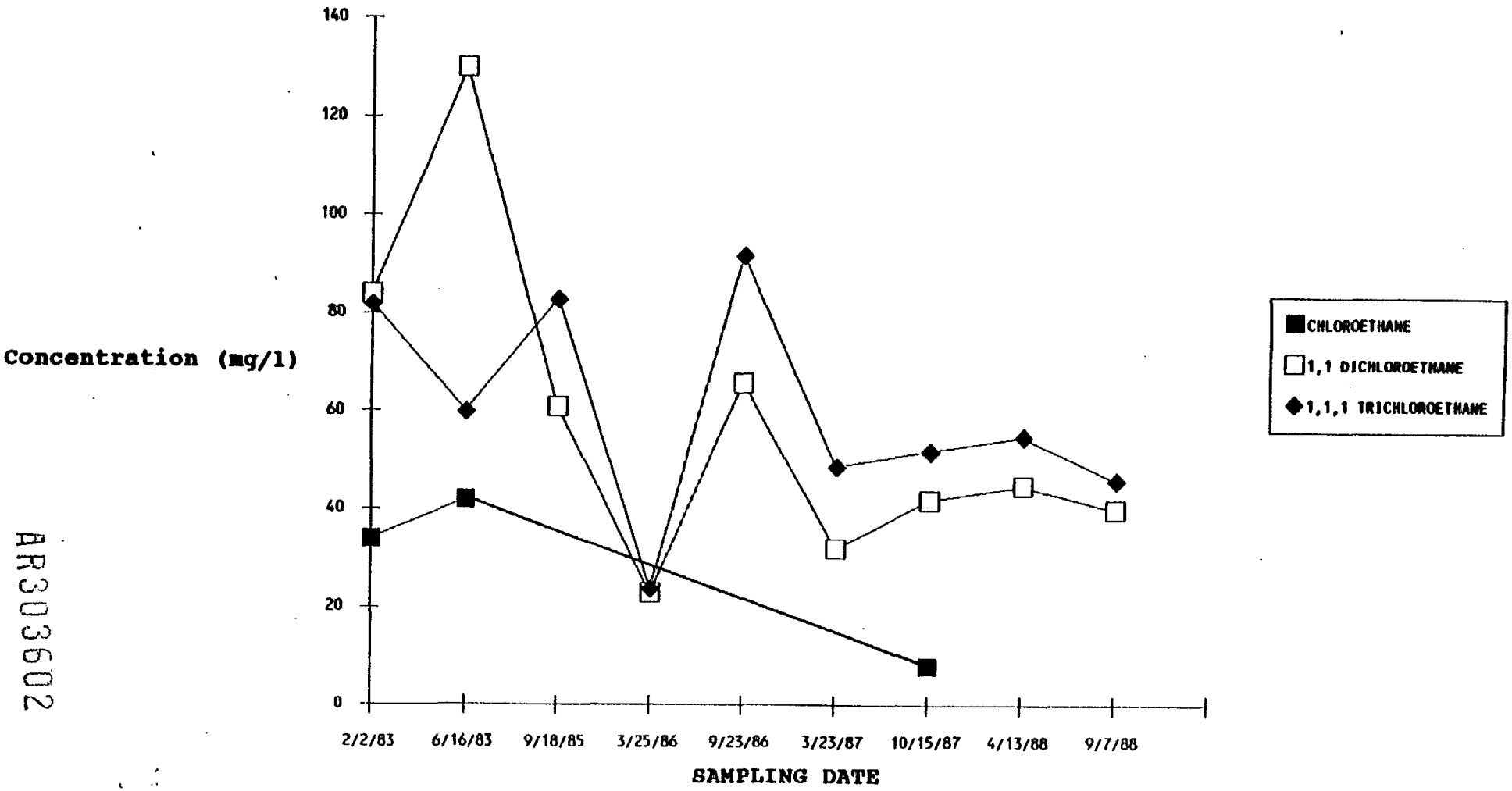
ANALYST Susan C Kar
SIGNATURE

DATE 6/20/86

AR303601

MONITORING WELL M1-LINED

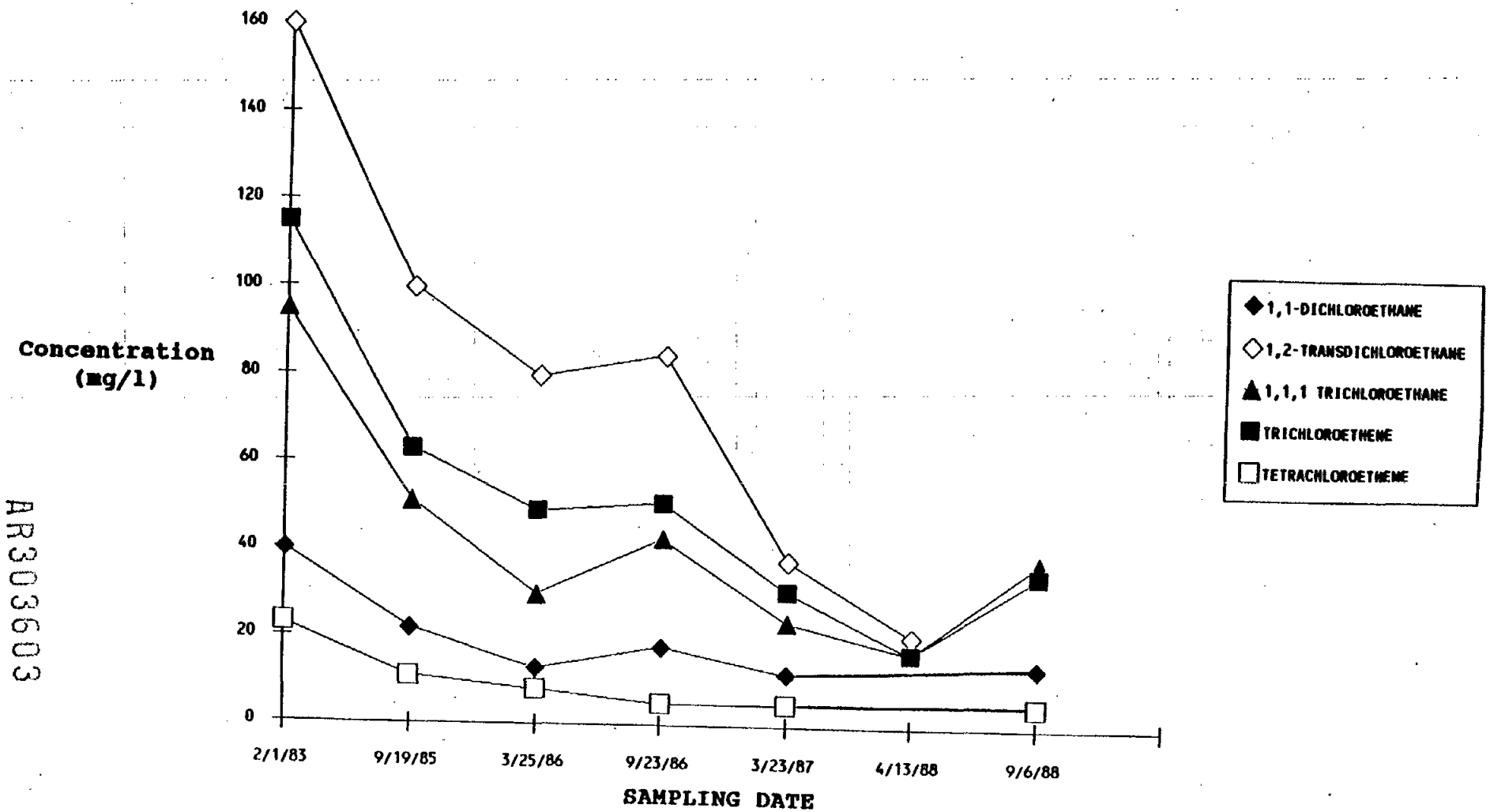
PLOT OF VOC CONCENTRATIONS VS TIME



AR303602

MONITORING WELL M2-AREA IV

PLOT OF VOC CONCENTRATIONS VS TIME



AR303603

APPENDIX
B

APPENDIX B

ESTIMATED LANDFILL WASTE DEPTH AND VOLUME CALCULATIONS

DRAFT

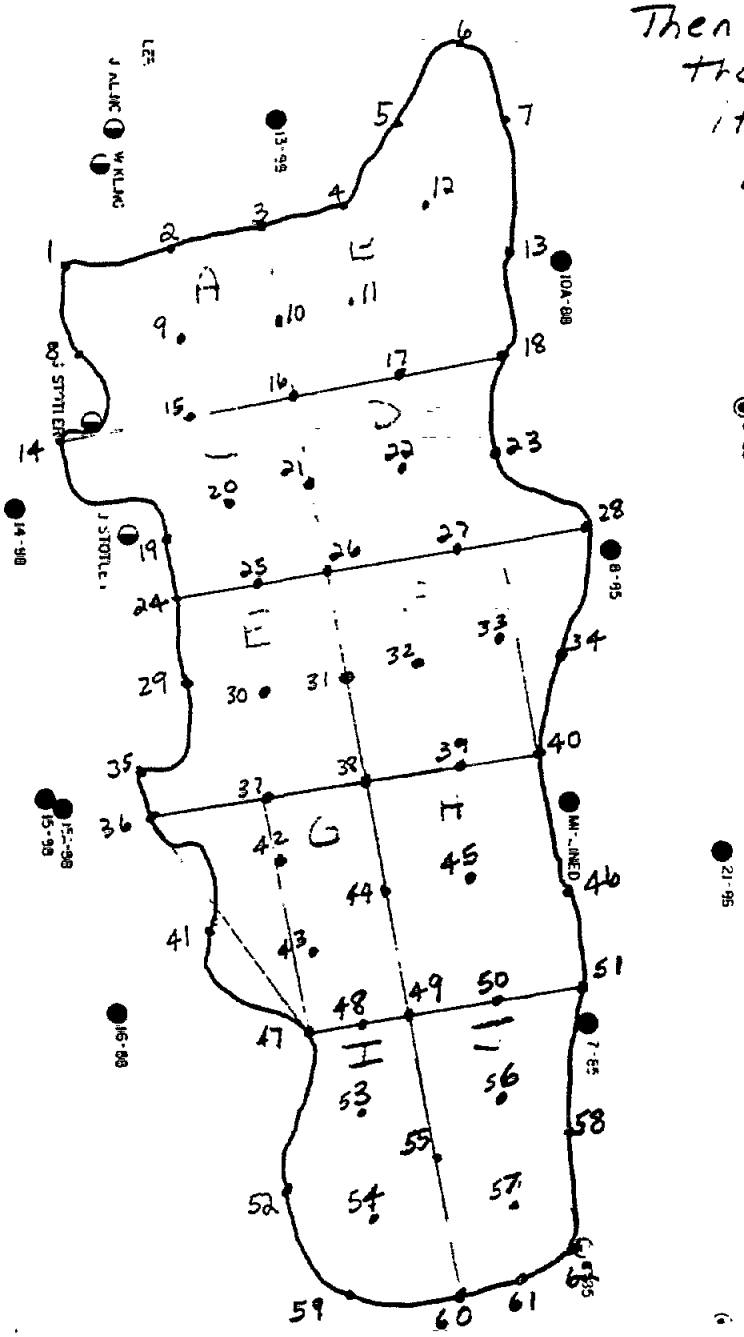
Canonie

By GCC Date 2/16/90 Subject Vertical Extent of Waste Sheet No. 1 of 5

Chkd. By EJG Date 3/2/90 Delta Quarries Landfill Proj. No. 88-033-1

1/4" X 1/4"

Contour elevations presented on 1963 topographic map of the site were compared with elevations on the 1988 base map prepared by TVG & A. The landfill was divided into ten sections (A-J). Then 32 pts. were marked on the edge of the site or in it, which are presented on this page. Elevations for 1963 & 1985 along with height change having been recorded for each point on the following page. Following this, an average height change (Δh) was calculated and used to determine the volume of each section. Individual volumes were then added to determine the total landfill volume.



AR303606

Canonie

By GCC Date 2/16/90 Subject Vertical Extent of Waste Sheet No. 2 of 5

Chkd. By EKG Date 3/2/90 Delta Quarries Landfill Proj. No. 88-033-13

1/4" X 1/4"

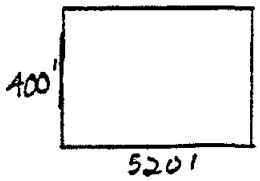
Pt. #	1988 Height (ft.)	1963 Height (ft.)	Δh Difference (ft.)	Pt. #	1988 Height (ft.)	1963 Height (ft.)	Δh Difference (ft.)
1	1280	1280	0	32	1250	1200	50
2	1290	1275	15	33	1210	1190	20
3	1285	1270	15	34	1185	1180	5
4	1280	1260	20	35	1240	1250	-10
5	1260	1250	10	36	1220	1210	10
6	1240	1230	10	37	1255	1220	35
7	1210	1190	20	38	1275	1210	65
8	1260	1250	10	39	1250	1210	40
9	1270	1240	30	40	1200	1200	0
10	1275	1240	35	41	1200	1190	10
11	1270	1220	50	42	1250	1200	50
12	1235	1200	35	43	1215	1190	25
13	1185	1180	5	44	1240	1195	45
14	1260	1250	10	45	1245	1200	45
15	1265	1235	30	46	1210	1200	10
16	1270	1220	50	47	1185	1180	5
17	1250	1190	60	48	1200	1180	20
18	1180	1170	10	49	1225	1185	40
19	1260	1255	5	50	1235	1190	45
20	1275	1250	25	51	1190	1185	5
21	1275	1230	45	52	1175	1170	5
22	1265	1210	55	53	1200	1175	25
23	1235	1210	25	54	1195	1175	20
24	1275	1270	5	55	1215	1180	35
25	1285	1240	45	56	1220	1190	30
26	1275	1230	45	57	1210	1180	30
27	1220	1200	20	58	1200	1185	15
28	1190	1185	5	59	1180	1170	10
29	1235	1260	-25	60	1185	1180	5
30	1275	1230	45	61	1180	1180	0
31	1280	1215	65	62	1200	1185	15

By GCC Date 2/16/90 Subject Volume Calculations Sheet No. 3 of 5

Chkd. By EKG Date 3/2/90 Delta Quarries Landfill Proj. No. 88-033-13

1/4" X 1/4"

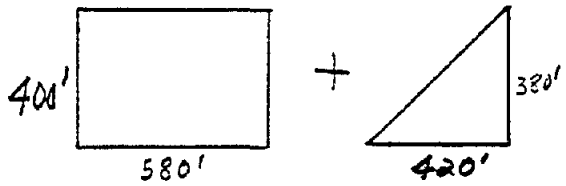
Area A:



$$V_A = (400)(520')(16') = 3,328,000 ft^3$$

$\Delta h = 20' - 4'$ (soil cover) $= 16'$

Area B:



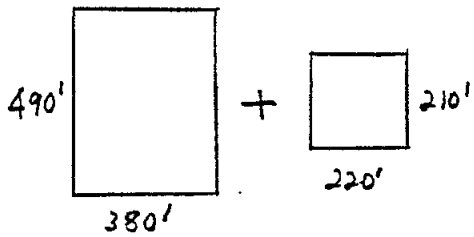
$\Delta h_1 = 37 - 4'$ (soil cover) $= 33'$

$\Delta h_2 = 15' - 4'$ (soil cover) $= 11'$

$$V_B = (400')(580')(33') + \tfrac{1}{2}(420')(380')(11') =$$

$$V_B = 8,533,800 ft^3$$

Area C:



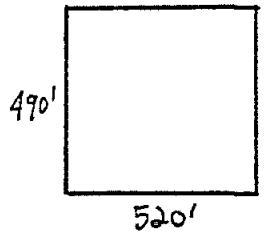
$\Delta h_1 = 30' - 4'$ (soil cover) $= 26'$

$\Delta h_2 = 10' - 4'$ (soil cover) $= 6'$

$$V_C = (490')(380')(26') + (220')(210')(6') =$$

$$V_C = 5,118,400 ft^3$$

Area D:



$$V_D = (490')(520')(36') = 9,172,800 ft^3$$

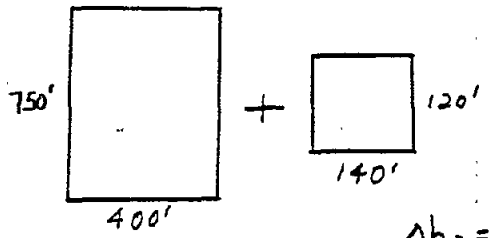
$\Delta h = 40' - 4'$ (soil cover) $= 36'$

By GCC Date 2/16/90 Subject Volume Calculations Sheet No. 4 of 5

Chkd. By FJG Date 3/6/90 Delta Quarries Landfill Proj. No. 88-033-13

1/4" X 1/4"

Area E:



$\forall_E = (750')(400')(34') + (120')(140')(2') =$

$\forall_E = 10,233,600\ ft^3$

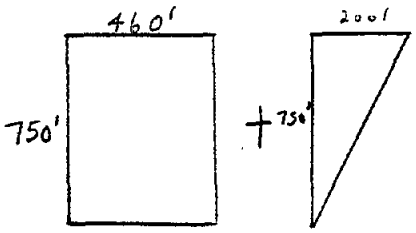
$\Delta h_1 = 38' - 4'$ (soil cover)

$\Delta h_1 = 34'$

$\Delta h_2 = 6' - 4'$ (soil cover)

$\Delta h_2 = 2'$

Area F:



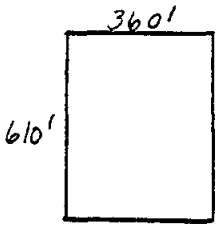
$\forall_F = (750')(460')(36') + 1/2(200')(750')(6')$

$\forall_F = 12,870,000\ ft^3$

$\Delta h_1 = 40' - 4'$ (soil cover) $= 36'$

$\Delta h_2 = 10' - 4'$ (soil cover) $= 6'$

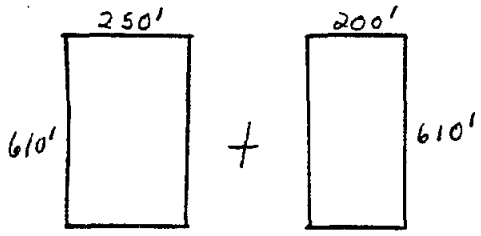
Area G:



$\forall_G = (610')(360')(26') = 5,709,600\ ft^3$

$\Delta h = 30' - 4'$ (soil cover) $= 26'$

Area H:



$\forall_H = (610')(250')(21') + (610')(200')(41')$

$\forall_H = 8,204,500\ ft^3$

$\Delta h_1 = 25' - 4'$ (soil cover) $= 21'$

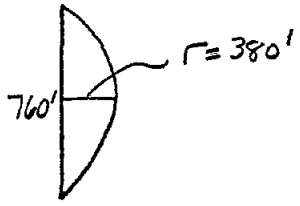
$\Delta h_2 = 45' - 4'$ (soil cover) $= 41'$

By GCC Date 2/16/90 Subject Volume Calculations Sheet No. 5 of 5

Chkd. By FJG Date 3/6/90 Delta Quarries Landfill Proj. No. 88-033

1/4" X 1/4"

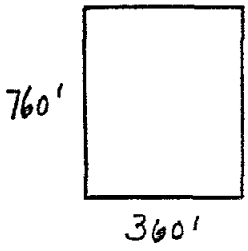
Area I:



$$\forall_I = \pi(380)^2(1/2)(16') = 3,629,200 ft^3$$

$\Delta h = 20' - 4'$ (soil cover) $= 16'$

Area J:



$$\forall_J = (760')(360')(21') = 5,745,600 ft^3$$

$\Delta h = 25' - 4'$ (soil cover) $= 21'$

$\therefore$ Total Volume ($\forall_T$) = $72,545,500 ft^3$

Canonie

B-7

By MLF Date 3/7/90 Subject Percentage of Industrial Wastes in the Delta Landfill Sheet No. 1 of 1

Chkd. By EVG Date 3/12/90 Proj. No. 88-033-13

1/4" X 1/4"

Volume of Industrial Wastes = 24,600* drums x $\frac{55 \text{ gal}}{1 \text{ drum}}$ x $\frac{0.13368 \text{ ft}^3}{\text{gal}}$ = 180869 ft³

* based on estimate contained in HRS report

Total Volume of Landfilled Wastes = 72,545,500 ft³

Percentage of Industrial Wastes in Landfill = $\frac{180869 \text{ ft}^3 \text{ industrial waste}}{72,565,500 \text{ ft}^3 \text{ total}}$ x 100% = 0.25%

AR303611

APPENDIX C

APPENDIX C

TARGET COMPOUND LIST AND TARGET ANALYTE LIST

DRAFT

TARGET COMPOUND AND TARGET ANALYTE LISTS

TARGET COMPOUND LIST

Organics

acenaphthene
acenaphthylene
acetone
aldrin
anthracene
Aroclor 1016
Aroclor 1221
Aroclor 1232
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260
benzene
benz(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzoic acid
benzo(ghi)perylene
benzo(a)pyrene
benzyl alcohol
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC
bis(2-chloroethoxy)methane
bis(2-chloroethyl)ether
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
bromodichloromethane
bromomethane
4-bromophenyl phenyl ether
butyl benzyl phthalate
carbon disulfide
carbon tetrachloride
chlordane
p-chloroaniline
chlorobenzene
p-chloro-m-cresol
chlorodibromomethane
chloroethane
chloroform
chloromethane
2-chloronaphthalene
2-chlorophenol
4-chlorophenyl phenyl ether
chrysene
ortho-cresol
para-cresol
4,4'DDD
4,4'DDE

DRAFT

TARGET COMPOUND AND TARGET ANALYTE LISTS
(Continued)

TARGET COMPOUND LIST

Organics (Continued)

4,4'DDT
dibenzo(a,h)anthracene
dibenzofuran
di-n-butyl phthalate
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
3,3'-dichlorobenzidine
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethylene
trans-1,2-dichloroethylene
dichloromethane
2,4-dichlorophenol
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
dieldrin
diethyl phthalate
2,4-dimethylphenol
dimethyl phthalate
4,6-dinitro-o-cresol
2,4-dinitrophenol
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
di-n-propylnitrosamine
endosulfan sulfate
endosulfan I (alpha)
endosulfan II (beta)
endrin
endrin ketone
ethyl benzene
fluoranthene
fluorene
heptachlor
heptachlor epoxide
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
2-hexanone
indeno(1,2,3-cd)pyrene
isophorone
methoxychlor
methyl ethyl ketone
2-methylnaphthalene
4-methyl-2-pentanone
naphthalene
m-nitroaniline
o-nitroaniline
p-nitroaniline

DRAFT

TARGET COMPOUND AND TARGET ANALYTE LISTS
(Continued)

TARGET COMPOUND LIST

Organics (Continued)

nitrobenzene
2-nitrophenol
4-nitrophenol
N-nitrosodiphenylamine
pentachlorophenol
phenanthrene
phenol
pyrene
styrene
1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
toxaphene
tribromomethane
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethylene
2,4,5-trichlorophenol
2,4,6-trichlorophenol
vinyl acetate
vinyl chloride
total xylenes

TARGET ANALYTE LIST

Metals

aluminum
antimony
arsenic
barium
beryllium
cadmium
calcium
chromium
cobalt
copper
iron
lead
magnesium
manganese
mercury
nickel
potassium
selenium
silver
sodium
thallium
vanadium
zinc

Miscellaneous

cyanide

APPENDIX D

APPENDIX D

MONITORING WELL BORING LOG AND GEOPHYSICAL LOGS

DRAFT

WELL CONSTRUCTION DETAIL FOR
WELLS INSTALLED BY CANONIE

DRAFT

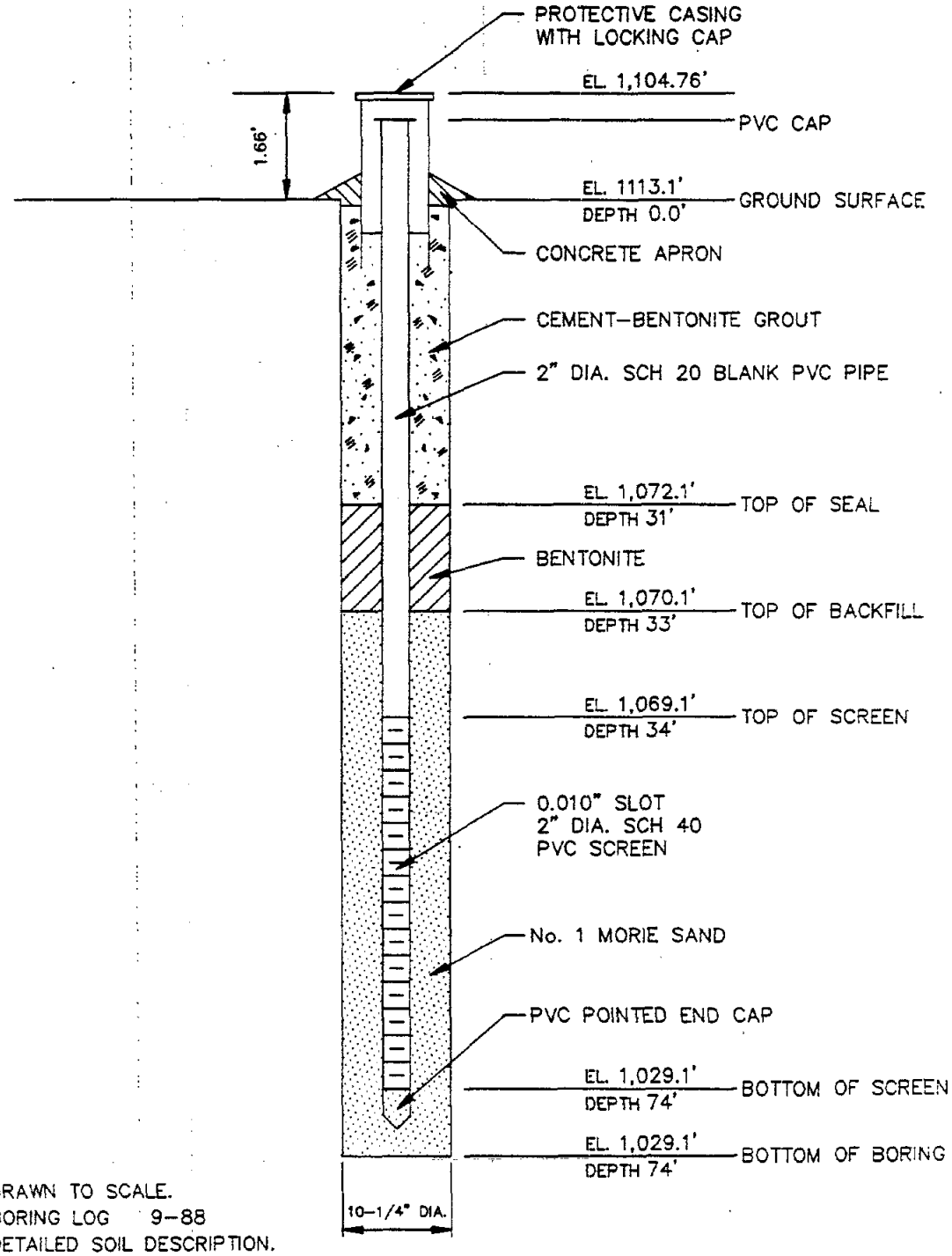
Canonie

PROJECT No. 88-033

WELL No. 9-88

PROJECT NAME DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL BLAIR CO. PA.

BORING LOCATION N 4422.331, E 19224.587 DATE 8-20-89 BY AJP



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG 9-88 FOR DETAILED SOIL DESCRIPTION.

AR303620

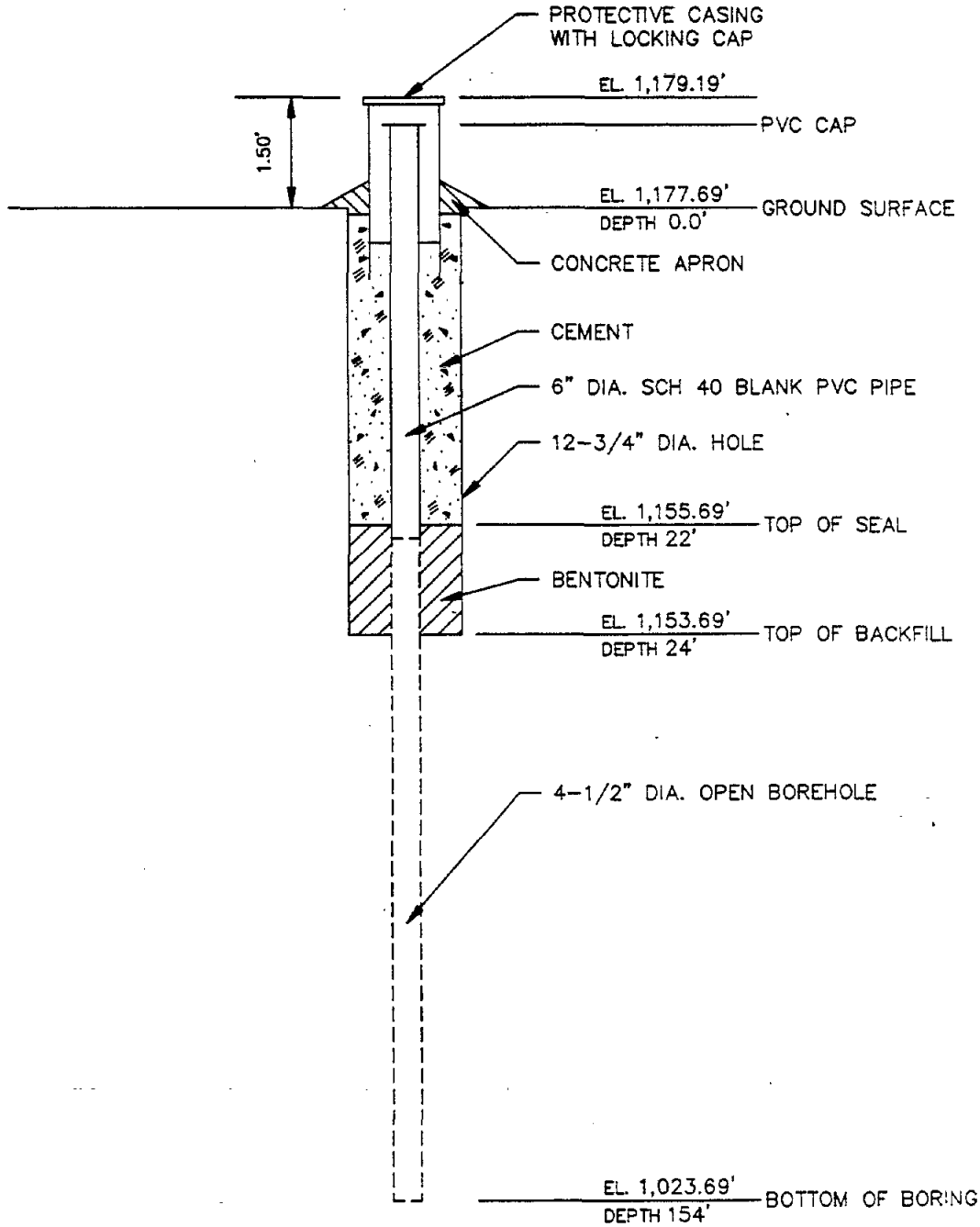
Canonie

PROJECT No. 88-033

WELL No. 19-88

PROJECT NAME DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL BLAIR CO. PA.

BORING LOCATION N 6273.393, E 20811.616 DATE 8-19-89 BY AJP



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG 19-88 FOR DETAILED SOIL DESCRIPTION.

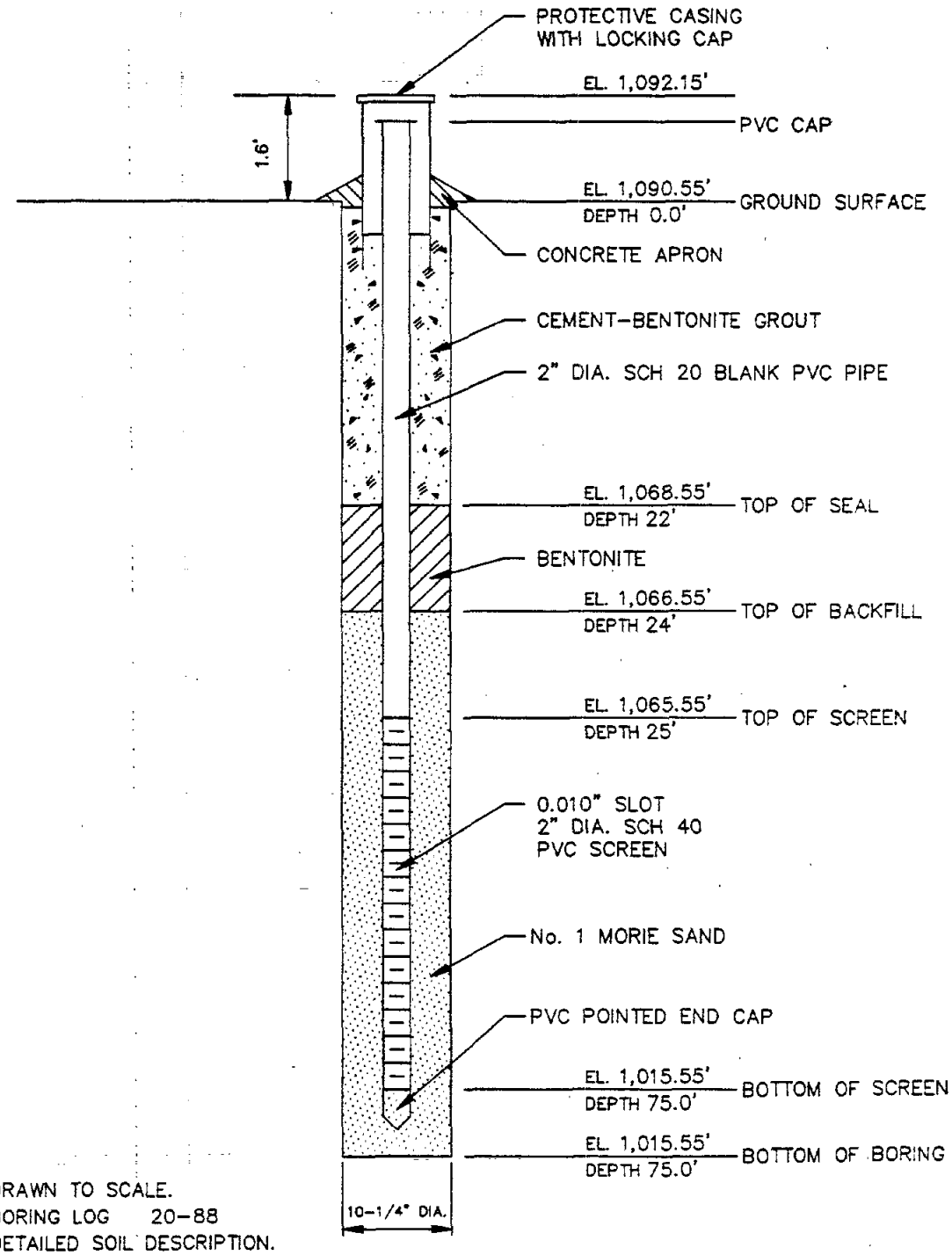
Canonie

PROJECT No. 88-033

WELL No. 20-88

PROJECT NAME DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL BLAIR CO. PA.

BORING LOCATION N 6586.427, E 20253.232 DATE 8-22-89 BY AJP



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG 20-88 FOR DETAILED SOIL DESCRIPTION.

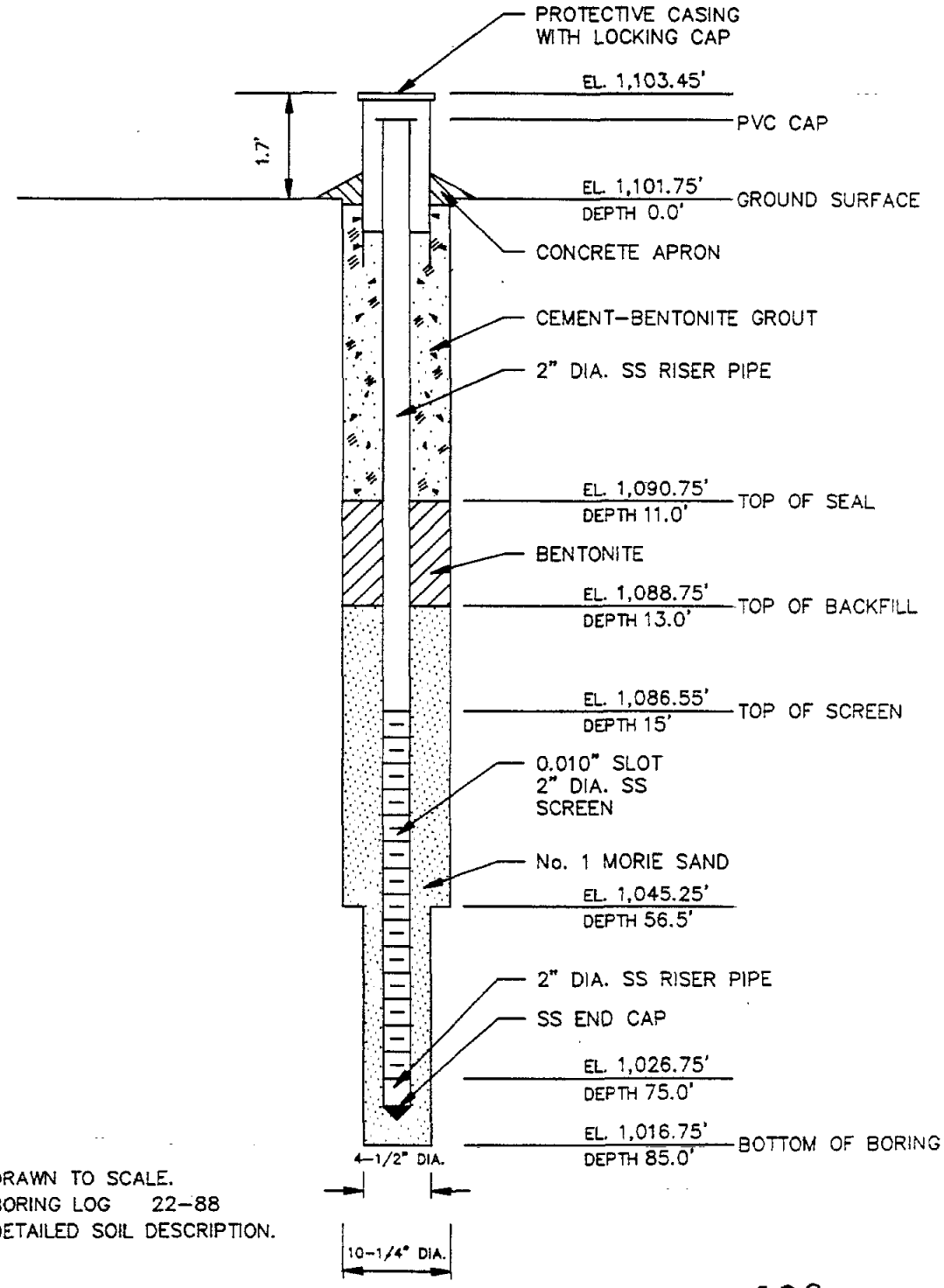
Canonie

PROJECT No. 88-033

WELL No. 22-88

PROJECT NAME DELTA QUARRIES AND DISPOSAL/STOTLER LANDFILL BLAIR CO. PA.

BORING LOCATION N 3110.680, E 18574.042 DATE 8-25-89 BY AJP



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG 22-88 FOR DETAILED SOIL DESCRIPTION.

BORING LOGS FOR MONITORING WELLS
INSTALLED BY CANONIE

DRAFT

Canonie

BORING LOG

PROJECT No.	88-033-13
BORING No.	9 - 88
LOGGED BY	AP
PAGE No.	1 of 1

PROJECT NAME: Delta Quarries and Disposal/Stotler Landfill

BORING LOCATION: N 4422.331 E 19224.587 — SURFACE ELEVATION: 1103.06 feet

DRILLER: CDS — DATE: START 8/19/89 FINISH 8/20/89

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	BLOW COUNT 6" 12" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
									SM/ML					Dark brown soil, silty sand, moist	
10															
20														Fine-grained orange to yellow brown sandstone, loosely consolidated. Ridgeley Sand Member of Old Port formation	
30	Split spoon sampling and blow count information is not applicable to rock borings													Hit water at 32 feet	
40														Interbedded shale stringers Running sand	
50															
60															
70															
														Bottom of boring at 74 feet.	

Rev. 2-89

Canonie

BORING LOG

PROJECT No.	88-033-13
BORING No.	19 - 88
LOGGED BY	AP
PAGE No.	1 of 2

PROJECT NAME Delta Quarries and Disposal/Stotler Landfill

BORING LOCATION N 6273.393 E 20811.616 SURFACE ELEVATION 1177.69 feet

DRILLER CDS DATE: START 8/17/89 FINISH 8/19/89

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0" 6" 6" 12"	BLOW COUNT 6" 12" 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
10													
20								SM/ML					
30												Light brown to brown gray loam	
40											40		
50												At 45 feet - Slight red or brown silt layer, gray to light gray, thinly laminated limestone, intermittent thin beds of yellow brown silt Tonoloway limestone At 55 feet - Red brown to brown color	
60												At 58.5 feet - Dry	
	Split spoon sampling and blow count information is not applicable to rock borings												
70												At 67 feet - Dark or brown silt layer At 70 feet - Dark brown to brown black silt layer At 75 feet - Dark brown to brown black silt layer At 76 feet - Lighter red brown silt layer At 78 feet - Brown black silt layer	
80													

AR303626

Rev. 2-89

Canonie

BORING LOG

PROJECT No.	88-033-13
BORING No.	19 - 88
LOGGED BY	AP
PAGE No.	2 of 2

PROJECT NAME Delta Quarries and Disposal/Stotler Landfill

BORING LOCATION N 6273.393 , E 20811.616 SURFACE ELEVATION 1,177.69 feet

DRILLER CDS DATE: START 8/17/89 FINISH 8/19/89

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0" 6" / 6" 12"	BLOW COUNT 6" 12" / 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
90													At 95 feet - Increasing moisture	
100													At 102 feet - Brown black silt layer	
													At 106 feet - Red brown silt layer	
110	Split spoon sampling and blow count information is not applicable to rock borings												At 110 feet - Orange brown silt layer	
													At 116 feet - Very moist	
120													Hard material from 116-145 feet	
130														
140													At 145 feet - Light brown black silt layer	
150														
160													Bottom of boring at 155 feet.	

Rev. 2-89

AR303627

Canonie

BORING LOG

PROJECT No.	88-033-13
BORING No.	20 - 88
LOGGED BY	AP
PAGE No.	1 of 1

PROJECT NAME Delta Quarries and Disposal/Stotler Landfill

BORING LOCATION N 6586.427 E 20253.232 SURFACE ELEVATION 1190.55 feet

DRILLER CDS DATE: START 8/22/89 FINISH 8/23/89

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
									ML				Brown loamy organic material	
10									SP/SM				Coarse grained orange red brown sand and silt, some small rock fragments	
20													Water at 19 feet	
30													At 32 feet - Flow water	
												34	Shale Top Shriver	
40													Black viscous mud Water zones periodically	
50	Split spoon sampling and blow count information is not applicable to rock borings												Black to gray black viscous heavy dense mud	
60														
70													Auger refusal at 75 feet Mud inhibited rotation of augers	
80													Bottom of boring at 75 feet.	

AR303628

Rev. 2-89

Canonie

BORING LOG

PROJECT No.	88-033-13
BORING No.	22 - 88
LOGGED BY	AP
PAGE No.	1 of 1

PROJECT NAME Delta Quarries and Disposal/Stotler Landfill

BORING LOCATION N 3110.680 E 18574.042 SURFACE ELEVATION 1101.75 feet

DRILLER CDS DATE: START 8/24/89 FINISH 8/25/89

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC. (in)	USCS SOIL TYPE	WC. (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
														Organic material	
									ML/CL			4.0		Red brown clay	
10														Fine-grained brown to orange brown sandstone and siltstone, Ridgeley Sand Member of the Old Port formation	
20														Water at 24 feet	
30	Split spoon sampling and blow count information is not applicable to rock borings														
40														Water at 40 feet	
50															
														Coarse, light brown sandstone	
60															
														Hard coarse medium sand conglomerate (57 to 75 feet)	
70														Auger bit inadvertantly cored	
												75			
80														Dark gray to black silty shale Shriver Shale Member of the Old Port formation Bottom of boring at 85 feet	

EP 303629

BORING LOGS FOR MONITORING WELLS
INSTALLED BY M&E

DRAFT

BORING LOGS FOR MONITORING WELLS
INSTALLED BY M&E

DRAFT

Old Stotler Site
M1 - Lined
Driller's Log

Well No.	Depth	Description
M1	0-22	Broken limestone, lost air at 20'
	22-30	Dirty limestone
	30-145	Limestone
	145-146	Dirty Limestone
	146-175	Limestone

NOTE: All depths are in feet below ground level. The well was drilled and logged by Fred Albright, Hollidaysburg, PA on June 20, 1979. Less than ½ gpm was blown from the well. 25 feet of 6-inch steel casing was installed.

Old Stotler Site

Well Log

M2 - Area IV

Depth	Description
0-8½	Orange-brown silty clay loam
8½-14	Light-gray shale; weathered, rotten; slightly calcitic
14-39	Dark-gray to very dark-gray limestone; small clay seam 1"-2" at 27'; installed 18 feet of 6-inch steel casing
39-60	Gray limestone; calcite banding; 8-inch broken zone at 60'
60-65	Very dark-gray to black limestone
65-89	Gray limestone; 10-inch soft/broken zone at 77'
89-137	Dark-gray limestone; calcite healed fragment at 89'; 90'-92' broken zone lost air return momentarily; 104' damp; 110' 1 gpm

NOTE: All depths are in feet below ground level. The well was drilled by David Eriksen of Eriksen Brothers Well Drilling, Hesston, PA on December 14, 1979. The well was logged by Bob Hershey of Meiser & Earl.

Old Stotler Site
Well Logs
4-79 and 5-79

Well No.	Depth	Description
4-79	0-17	Yellow silty sand
	17-51	Red sand with some silt and clay; medium to coarse grained; had to develop well to get a 4 gpm yield; installed 40 feet of 4-inch PVC well casing; bottom 30 feet was saw slotted.
5-79	0-30	Brown clay and shale fragments
	30-50	Dark-brown shale; rotten; <1 gpm; installed 50½ ft. of 4-inch PVC well casing; bottom 30 ft. was saw slotted.

NOTE: All depths are in feet below ground level. Both wells were drilled by Fred Albright, Hollidaysburg, PA on May 18, 1979. The well was logged by Bob Hershey of Meiser & Earl.

M-6-85

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
	0		CLAY FILL FROM "BORROW AREA"	SOFT
			(SOIL AND LEAF LITTER, < 6")	
			GRAY/BROWN FINE-GRAINED THICK-BEDDED LIMESTONE	MEDIUM
			THIN-BEDDED LIGHT GRAY AND TAN FINE-GRAINED LIMESTONE	
	10		← WEATHERED (SLIGHTLY BROKEN)	SOFT AND BROKEN
			GRAY/BROWN FINE-GRAINED MASSIVE BEDDED LS.	MEDIUM
			THIN-BEDDED LIGHT GRAY AND TAN FINE-GRAINED LIMESTONE	HARD
			← (BLACK CHERT NODULES OR LENSES)	
DRY	20		← (BLACK CHERT NODULES OR LENSES)	VERY HARD
			LIGHT GRAY THIN-BEDDED, FINE-GRAINED LIMESTONE	HARD
	30		GRAY/BROWN FINE-GRAINED LIMESTONE (MORE MASSIVE BEDDED)	VERY HARD
			← BLACK CHERT	SOFT
	40			HARD
SLIGHTLY DAMP			TAN THIN BEDDED FINE-GRAINED LIMESTONE	
			← (SLIGHTLY WEATHERED ZONE)	MEDIUM
	50		BROWN FINE-GRAINED LIMESTONE	
			TAN FINE-GRAINED THIN-BEDDED LIMESTONE	
DRY			← (ORANGE SILT)	
	60		DARK BROWN FINE-GRAINED LIMESTONE	MED. HARD
				HARD
			← ORANGE SLIGHTLY WEATHERED STREAK	
	70		TAN THIN-BEDDED FINE-GRAINED LIMESTONE	

M-6-85

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
	70		TAN AND LIGHT GRAY FINE-GRAINED LIMESTONE (THIN-BEDDED)	MEDIUM HARD
	80		BROWN MORE MASSIVE FINE-GRAINED LIMESTONE ← SLIGHTLY WEATHERED ORANGE SILTY STREAK	HARD TO VERY HARD
DRY	90			VERY HARD
			LIGHT GRAY MEDIUM GRAINED LIMESTONE (SUGAR TEXTURED - CALCITE CLEAVAGE GLISTENS) ← (ORANGE SILTY WEATHERED STREAK)	
	100			
			LIGHT GRAY TO TAN FINE-GRAINED THIN BEDDED LIMESTONE	
	110		← (WEATHERED ORANGE SILTY STREAK)	MEDIUM
SLIGHTLY DAMP			WEATHERED TAN LIMESTONE - CHIPS ARE SILT-SIZED	
	120		TAN FINE-GRAINED THIN-BEDDED LIMESTONE	
			DARK BROWN FINE-GRAINED LIMESTONE ← ORANGE SLIGHTLY WEATHERED SILTY STREAK	MEDIUM SOFT
	130			
(DAMP) →			TAN FINE-GRAINED THIN-BEDDED LIMESTONE	
SLIGHTLY DAMP			← (WEATHERED AND SLIGHTLY BROKEN)	
			DARK BROWN FINE-GRAINED LIMESTONE	MEDIUM
DAMP	140			

AR303636

M-6-85

'ATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLIN CONDITIONS
DRY	140		DARK BROWN FINE-GRAINED LIMESTONE	VERY HARD
SLIGHTLY DAMP			THIN-BEDDED FINE-GRAINED TAN TO LIGHT GRAY LIMESTONE	HARD TO MEDIUM
	150		DARK BROWN FINE-GRAINED LIMESTONE	
			(SLIGHTLY WEATHERED)	
DAMP	160		TAN FINE-GRAINED THIN-BEDDED LIMESTONE	HARD
			(ORANGE SILTY STREAK-SLIGHTLY WEATHERED)	
	170		DARK BROWN FINE-GRAINED LIMESTONE	
			B.H. - 174'	
	180			
	190			
	200			
	210			

AR303637

M-7-85

D-2

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
	0		CLAY FILL FROM "BORROW AREA" (SOIL AND LEAF LITTER, < 6")	SOFT
	10		MEDIUM GRAY FINE-GRAINED LIMESTONE (SOME YELLOW CALCITE CHIPS)	MEDIUM
			(BROKEN SLIGHTLY)	B MED. HARD
DRY			(BROKEN)	B
	20		(BROKEN SLIGHTLY)	B HARD TO VERY HARD
			THINNER BEDDED TAN AND LIGHT GRAY LIMESTONE	
	30		MORE MASSIVE BEDDED DARK TO MEDIUM GRAY LIMESTONE (WITH CALCITE VEINS)	VERY HARD
			(SLIGHTLY BROKEN)	BROKE
MOIST			ORANGE/BROWN PLASTIC CLAYEY SILT	MEDIUM SOFT
			WEATHERED TAN FINE GRAINED LIMESTONE	MEDIUM HARD
	40		DARK GRAY FINE-GRAINED LIMESTONE	VERY HARD
DRY			ORANGE SILT - NO CLAY	
			WEATHERED LIGHT GRAY AND TAN LIMESTONE	MEDIUM
MOIST			YELLOW LIMESTONE SILT AND ORANGE/BROWN SILTY PLASTIC CLAY	SOFT
DAMP	50		MEDIUM GRAY FINE-GRAINED LIMESTONE	HARD
			(SLIGHT WEATHERING TO LIMESTONE SILT)	
DRY	60		DARK GRAY FINE-GRAINED LIMESTONE	VERY HARD
LIGHT DAMP			DARK GRAY FINE-GRAINED LIMESTONE (VERY SLIGHTLY WEATHERED)	HARD VERY HARD
DRY	70			

AR303638

M-2-85

D-21

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
RY	70		SLIGHTLY BROKEN AND WEATHERED TAN LIMESTONE	HARD
			LIGHT GRAY FINE-GRAINED LIMESTONE	MEDIU
SLIGHTLY DAMP			VOID ~2'	NO AIR LOSS STEEL FELL
			WEATHERED ORANGE LIMESTONE AND LIMESTONE SILT	MEDIUM BROKEN
MOIST	80		(BROKEN) ORANGE/BROWN PLASTIC SILT (NO RETURN 80.5' to 82.5')	SOFT
SLIGHTLY DAMP			WEATHERED TAN FINE-GRAINED THIN-BEDDED LIMESTONE	HARD MEDIUM
	90		(BROKEN) VERY WEATHERED MEDIUM-CRYSTALLINE LIMESTONE WITH ORANGE CLAYEY SILT	
MOIST			WEATHERED LIGHT GRAY FINE-GRAINED THIN-BEDDED LIMESTONE, (POOR RETURN 94'-99')	SOFT
DAMP				
VERY SLIGHTLY DAMP	100		LIGHT GRAY FINE-GRAINED THIN-BEDDED LIMESTONE	MEDIUM HAR
DRY	110		BROKEN AND WEATHERED GRAY/BROWN F.G. LIMESTONE	(BROKEN SOFT
MOIST			PLASTIC ORANGE/BROWN SILT	MEDIUM
SLIGHTLY DAMP	120		TAN FINE-GRAINED LIMESTONE (CHIPS ARE SAND AND SILT-SIZED)	HARD
DAMP				MEDIUM
MORE DAMP	130		(BROKEN AND WEATHERED - STREAK OF ORANGE SILT)	SOFT BROKEN SOFT
DAMP			GRAY/BROWN FINE-GRAINED LIMESTONE (CHIPS ARE SILT-SIZED)	MEDIUM
	140			HARD

AR303639

M-7-85

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
DAMP	140		LIGHT GRAY/BROWN FINE-GRAINED LIMESTONE (CHIPS ARE SILT)	VERY HARD
~1 gpm WET	150			MEDIUM
~2 GPM			DARK GRAY BROWN FINE-GRAINED LIMESTONE	HARD
~4 GPM	160			
	170		BROKEN	BROKEN
14 gpm			PROBABLY WEATHERED-(FINES WASHED FROM SAMPLE)	MEDIUM SOFT
			B.H. - 174'	
	180			
	190			
	200			
	210			

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
	0			
	10			
	20			
DRY	30		GRAY FINE-GRAINED LIMESTONE	MEDIUM
			(ORANGE BROWN SILT AND ORANGE CLAY)	BROKEN
			GRAY/BROWN FINE-GRAINED LIMESTONE (BROKEN)	MEDIUM BROKEN
NE			ORANGE CLAYEY SILT — (POOR RETURN)	SOFT
DRY	40		GRAY FINE-GRAINED LIMESTONE (with a few laminae of black limestone)	VERY HARD
DAMP			SLIGHTLY WEATHERED GRAY FINE-GRAINED LIMESTONE	MEDIUM
ET			ORANGE SILTY CLAY	SOFT
	50		SLIGHTLY WEATHERED DARK GRAY FINE-GRAINED LIMESTONE	VERY HARD
DAMP			LIGHT GRAY FINE-GRAINED LIMESTONE (SLIGHTLY WEATHERED)	
DRY			GRAY FINE-GRAINED LIMESTONE	
IST	60		PLASTIC ORANGE/BROWN CLAY - FRACTURE FILLING	SOFT AND BROKEN
DRY				VERY HARD
	70			

M-8-85

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
(MOIST)	70		GRAY FINE-GRAINED LIMESTONE (FRACTURE FILLING?) WEATHERED LIMESTONE AND MOIST SILT	MEDIUM SOFT
			THINLY LAMINATED GRAY FINE GRAINED LIMESTONE	HARD
DRY			LIGHT GRAY FINE-GRAINED LIMESTONE	
	80			
WET / DRY			ORANGE PLASTIC SILT – (POOR RETURN)	SOFT AND SLIGHTLY BROKE.
			LIGHT GRAY FINE-GRAINED LIMESTONE (WEATHERED ZONE)	HARD MEDIUM
DAMP			LIGHT AND DARK GRAY FINE-GRAINED LIMESTONE	HARD
(MOIST)	90		(BROKEN BADLY)	BROKEN BADLY, BIT STUC
			SLIGHTLY WEATHERED GRAY FINE-GRAINED LIMESTONE	HARD
DAMP			(BROKEN) (WEATHERED AND BROKEN)	SOFT AND BROKEN
WET @ 1/3 HOUR BREAK	100		GRAY FINE-GRAINED LIMESTONE	HARD
			(THINLY LAMINATED OVER THIS INTERVAL)	
			DARK GRAY FINE-GRAINED LIMESTONE (MORE MASSIVE BEDDED)	
	110			
DRY			(SLIGHT WEATHERING)	VERY HARD
			DARK GRAY FINE-GRAINED LIMESTONE (THICK BEDDED)	
	120			
DAMP			(WEATHERED SILTY ZONE)	MEDIUM
WET			WEATHERED ZONE	HARD SOFT MEDIUM
	130		RETURN TOO POOR TO DETERMINE LITHOLOGY	SOFT
			GRAY FINE-GRAINED LIMESTONE	MEDIUM/HARD
	140			

AR303642

M-8-86

WATER CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITION
WET	140		DARK GRAY FINE-GRAINED LIMESTONE	MEDIUM HARD
		(BROKEN)		BROKEN HARD
	150		B.H. - 150'	
	160			
	170			
	180			
	190			
	200			
	210			

TASK 17

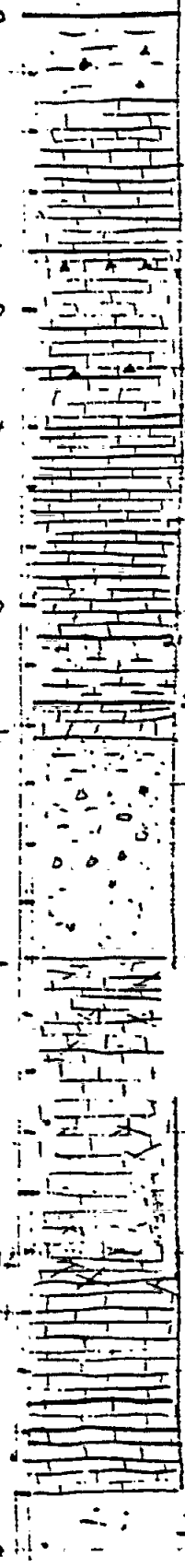
QUALIIFICATION OF DRILL LOGS:

The drill logs of all monitoring wells drilled at the Delta Site between September 26 and November 22, 1988 are preliminary field logs and have therefore, not been refined by Meiser & Earl's process of reviewing washed drill cutting samples. Revisions in the lithologic descriptions in some horizons may result if this review were to be undertaken.

DELTA RI/FS — 5:20 Set up — Oct. 25, 1988

10-88 — Oct. 26, 1988

LOGGED AND Sampled by R. Pollok



Sound Conditions	Depth	Graphic Log	Lithologic Description	Drilling Condition
DAMP to Slightly DAMP	0		LT. BROWN SILT LOAM WITH GRAY chert	SOF
	3		WEATHERED GRAY AND TAN LIMESTONE WITH SOME THIN ORANGE-BROWN SILT ZONES, ALSO MINOR DARK GRAY CHERT	MED SOF UNC
DAMP TO MOIST DAMP	7		chert 8'	
	10		chert 12' ?	
[illegible]	14		Slightly Weathered GRAY FINE-GRAINED LIMESTONE	MED HAR A LITT. [illegible]
[illegible]	19		19' Stopped to set 20' of 6" sched. 40 PVC casing	
[illegible]	20			
22 ROD CHG	21		WEATHERED ZONE LIMESTONE AND ORANGE-BROWN TO LT BROWN SILT	MED SOF
	23			
MOIST to WET, MUD LUMPS	24.5		NO GOETHITE NO SILTSTONE Poor Return [illegible] FRAGMENTS IN YELLOW-BROWN SANDY LOAM MATRIX, ALSO FRAGMENTS OF [illegible] AND GOETHITE [illegible] Fracture/Void Filling? Fragments are of Ridgely/Shriver units	SOF
	30			MED SOF
MOIST TO WET?			GRAY AND [illegible] TO FINELY CRYSTALLINE LIMESTONE [illegible]	MED SOF UNC
WET 4 gpm [illegible] 575 @ 14' C	37		still Shriver and Ridgely cuttings in chips	
	40		Soft Zone → Could Be more voids Filled with Colluvium	
ROD CHG	42			
Big H2O	44			
	47		DARK GRAY to PLACK FINELY CRYSTALLINE Limestone with ABUNDANT WHITE CALCITE VEINLETS	
	50			

AR303645

DELTA RI/FS
10-88

OCT. 26, 1988

Structure Conditions Blown Yield	Depth	Graphic Log	Lithologic Description	Drilling Conditions Hardness
			TAN TO LIGHT GRAY-BROWN FINELY-CRYSTALLINE LIMESTONE	
7 gpm + Rig H_2O	50		TAN TO LIGHT GRAY-BROWN FINELY-CRYSTALLINE Limestone	MED. HA
	53 – 54		FRACTURE OR WEATHERED ZONE NO CLAY OR SILT LUMPS	53 MED. SO
			FRACTURE OR WEATHERED ZONE NO CLAY OR SILT LUMPS IN CHIPS	54 MED. 4
				55.5 HARD EVEN
			58 ← BLACK chert @ 58'	57 MEDIUM HARD TO HAR
	60			
ROD Chg.				
			66' ← GUESSED AT BOUNDARY – CUTTINGS MIXED	
			TAN AND DARK GRAY FINELY-CRYSTALLINE Limestone 66 – 82	
	70			
	80			
			T.D. 82' 3" B.G.L.	
			Blown Yield After Drilling Only ~ 1 gpm – Probably Blowing Back into Voids or Fractures 24-44'	
	90			
	100			

RETURN MIXED WITH CUTTINGS FROM ABOVE ? (21-32, 34-44)

AR303646.

DELTA KI/FS
10-88

Oct 5 1988
26

Depth	Hrs	% LEL	% OX	Location of Reading	Blow Yield	Sp. Cond	Temp °C	H	Temp °C	Comments
13	0.0	000	20.9	6" Above Hole	—	—		—	—	10-25-[illegible] 5:50 PM
19	0.0	000	20.9	6" Above Hole	—			—	—	10:[illegible] 6:10 PM
19	0.2	000	20.9	6" Above Hole	—	—	—	—	—	10-26 [illegible] 10:00 AM
42	0.5	000	20.9	In Hole	4 gpm	675 @ 14.5°		6.59	13.6	Time 11:[illegible]
50	0.0	000	[illegible]	Under Apron	—	—	—	—	—	Time ~12:[illegible]
50	0.0	000	20.9	"	—	—		—	—	Time 4:50 [illegible] Rig Shut down
82	0.0	000	20.9	6" from T.O.C.	—	—	—	—	—	10-26-88 6:00 AM
82	0.0	000	21.0	6" From T.O.C.	4 gpm	325 @ 12°C		7.08 @ 6.6°		10-27-88 9:30 AM
82	—	—	—	—	2 gpm	415 @ 10.5°		—	—	9:40 AM
82	10:00 PM 0.0	10:00 PM 000	10:00 PM 21.0	Under Apron	2 gpm	395 @ 11		—	—	9:45 "
82 collapsed to 32	0.0	[illegible]	20.9	Under Apron	—	—	—	—	—	12:15 AM

AR303647

DELTA RI/FS
10-88
Recopied 8-28-89

Oct. 25, 1988
26th and 27th

D-3(

Depth	Hnu	% LEL	% OX	Location of Reading	Blown Yield	Sp. Cond.	Temp °C	pH →	Temp. °C	Comment
13'	0.0	000	20.9	6" Above Hole	—	—	—	—	—	10-25-[illegible] 5:50 [illegible]
19'	0.0	000	20.9	6" Above Hole	—	—	—	—	—	10-2[illegible] [illegible]
19'	0.2	000	20.9	6" Above Hole	—	—	—	—	—	10-26-8[illegible] 10:00 AM [illegible]
42'	0.5	000	20.9	in Hole	4 GPM	675 @ 14.5°		6.59 @ 13.6°		10-2[illegible] 11:35 A
50'	0.0	000	20.9	Under Apron	—	—	—	—	—	12:00 N
50'	0.0	000	20.9	"	—	—	—	—	—	4:00 PM
82'	0.0	000	20.9	6" From T.O.C.	—	—	—	—	—	10-26-8[illegible] 6:00 PM
82'	0.0	000	21.0	6" From T.O.C.	4 GPM	325 @ 12° C		7.08 @ 6.6°		10-27-8[illegible] 9:30 AM
82'	—	—	—	—	3 GPM	415 @ 10.5°		—	—	9:40 AM
82'	10:00 PM 0.0	10:00 PM 000	10:00 PM 21.0	Under Apron	3 GPM	395 @ 11°		—	—	9:45 AM
[illegible]2' Collapsed to 32'	0.0	000	20.9	Under Apron	—	—	—	—	—	12:15 PM

AR303648

DELTA RI/FS

10-88

WELL CONSTRUCTION DETAILS

1. 8" Hole with Hammer 0 – 19' BGL.
2. 10" Ream with 10" Roller Bit 0-19'
3. Set 20' of 6" PVC. Schd 40 casing @ 19' BGL.
4. Bentonite Pellets in Annulus (1 Bucket) – 19'-17'3" (2")
5. Hydrated with 5 gallon of Altoona City Water
6. Grout – 17'3" to 3'8" BGL.
   5 – 94 lb Bags – Portland Type I
   15-18 lbs – Granular Bentonite
   30 gallons H_2O
7. 6" Hole with Hammer 0 – 82' BGL.
8. Pulled out – Chunks? Fell in @ 33' BGL. QUIT FOR DAY 6:00 P
9. Put steels in Hole 9:30A Cleaned to 82' Pulled out. Collapsed to 32
10. Back in Hole to 62' " " Collapsed to 32
11. Pulled off Hole 12:25, Pulled up Rubber
12. Grouted with Sakrete 3'8" – 0' Poured Pad around top
13. Placed 6½' of 8" steel Casing over 6" PVC @ 3½' BGL.
14. Steel Locking Cap on Top

10-25-88

10-26-88
9:30 AM

10-27-88
10:30

5:00 PM

AR303649

Delta RI/FS

10A-88

Nov. 14, 1988

Logged & Sampled by R. Polls

	Graphic Log	Lithologic Description		
Damp	0	Yellow-Brown to Light Brown Loam with Light Gray Limestone FRAGMENTS	High Vol. Return	Soft
	5	Light Gray Limestone with Silt Loam	Lt. Brown 5 Reduced Poor Return	Med. Uneven
	10	Sandstone (... of the interbedded ...)		
Moist	13	No Return - Drilled like soft silt or clay, hammer not working, could be very weathered limestone	13 No Return Lost Air Circulation	Very Soft even
Rod. Moist	14	No Return		
Damp	20	Check chips from 21 After Blowing when Return Resumed	@ 21' Not Blowing Air from 10-88	
	21	Weathered light gray to Tan Thin Bedded Limestone	22	Soft Uneven
		WEATHERED LIGHT GRAY TO TAN THIN-BEDDED LIMESTONE 21-28	26	Medium even
			28	Soft even
	30	Light Brown ... Limestone, Poor Return 28-30	Hole Not Collapsing or Filling @ 30' 30'	Medium even
		Weathered Light Gray to Tan thin-bedded Finely crystalline Limestone		
	36	WEATHERED TAN FINELY-crystalline Limestone, chips are dust	Good Return	Med/S Uneven
	40	WEATHERED TAN FINELY-CRYSTALLINE LIMESTONE (CHIPS ARE DUST)		
Water @ Rod	41			
Damp	42.5			
	49	GRAY FINELY CRYSTALLINE Limestone		Medium Fairly
	50			

AR303650

Delta RI/FS
10A-88

Nov. [illegible], 1988
Logged & Sampled by R. [illegible]

Graphic Log	Lithologic Description		
0	Yellow-Brown to light Loam with [illegible] Limestone	Vol. Return	Soft
5	Weathered [illegible] Limestone and [illegible] (Some of this interval is [illegible], with a few chips of Shriver Siltstone and Ridgely Sandstone.	5	Med
10		Poor Return	
13		13	
No Return	? Drilled like soft Silt or Clay [illegible] (Could be very weathered limestone)	14 No Return Lost Air	Very Soft Even
20	Check chips from 21 after blowing when Return Resumed	@ 21' Not Blowing Air from 10-88	
21	Weathered light gray to Tan thin bedded limestone	21	
		22	Soft Uneven
		26	
28	Lt. Brown Silt or Weathered Limestone Poor Return	28	
30		Note [illegible] @ 30'	
	Weathered Light Gray to Tan thin-bedded Finely crystalline Limestone		Even
36	Weathered Tan Finely-crystalline Limestone, chips are dust	6000 Return	Med/Uneven
40			
49	Gray Finely Crystalline Limestone		Medium Fairly
50			

Air

Dam

41 [illegible] Rod [illegible]

AR303651

Delta RI/FS
IOA-88

Nov 14, 1988
Logged & Sampled by R. P...

Depth	Graphic Log	Lithologic Description	Cond.
		Gray Finely-crystalline Limestone	
		Gray Finely-Crystalline Limestone	
60			
63		Tan weathered Finely Crystalline	
		Tan-weathered Finely Crystalline Limestone	
70		70 Gray Finely-Crystalline Limestone	
72		71 Tan weathered Finely Crys. Limestone	

Very Damp

Caps are Marble size

Tan-weathered Finely Crystalline Limestone

Set 5 min ... 8 gpm Estimated ... 5 min ... Yield ... gpm

T.D. 72' B.G.L.

11/15/88 Water Level 26' B.G.L 10-16-8 8:45AM

Final Blown Yield 6-7 gpm

See Bob's notes { Final pH 7 @ ___ °C
Final Sp. Cond. ___ µmhos @ ___ °C

Tan weathered Finely Crystalline Limestone

AR303652

DELTA II/FS

10A-88 WELL DATA

Nov. 14 [illegible] 8

Data Collected by R. Pollok

Date	Drilled Depth	Loc. of Air Measurement	Hnu	% Ox	% LEL	Time	pH	Sp. Cond µmhos	Brown Yield	Comments
11/14/88	0	10' From Rig	0.2	001	20.7	2:45	—	—		Rig o[illegible]
"	72'	@ Table	0.2	001	20.7	4:00	Hnu climbs slowly off scale like its reading Hammer oil (in hole)			Rig on not B[illegible]
"	72'	in Hole (6")	0.8	001	20.7	4:00	7.08 @ 14.4° C	860 @ 16.3° C	~10 gpm estim.	Rig on not Bl[illegible]
"	72'	— 6"	—	—	—	—	7.35 @ 17.5°	1010 @ 17.5° C	6-8 gpm estimate	Rig on
"	72'	in Hole 8"	0.8	000	20.8	5:00	—	—		Rig on not Bl[illegible]
11/14/88			0.2	000	20.8	~5:02	—	—	—	Rig [illegible] turned [illegible]
11/14		Hnu Readings of .8 above were taken after probe was in Hole ~ 30 Sec. — Thereafter Reading slowly climbed to > 10 in about 1 min. — I Believe this is due to vaporized Hammer oil in Hole								
"										
11/15/88										
11/16/88	74'	20' from hole, Background	0.2	001	20.7	8:45A	—	—	—	8" casing [illegible]
	74'	in Hole + workspace	0.3	001	20.7	8:50	—	—	—	"
	74'	workspace [illegible] table	0.3	001	20.7	~10:00	—	—	—	Rig [illegible] casing [illegible] to 28' 3[illegible]
	74'	6" inside 8" casing	1.0	001	20.7	~10:00A	—	—	—	
	74'	Open Hole To 16.5'	0.3	001	20.7	3:00	—	—	—	[illegible]
	74'	Background 30' from hole	0.3	001	20.7	3:00	—	—	—	Open to [illegible]

AR303653

Delta RI/FS — Nov. 14, 15, 16 - 88

WELL CONSTRUCTION DETAILS

10A - 88

11-14-88 1. 6" Pilot Hole with Hammer 0-72'

2. Let Sit 5 min. — Blow Water Sample @ 10 gpm 4:00 pm

3. Reamed Hole to 8" with Hammer 0-72', Blew 3-4 minutes

Blown Yield — 6-8 gpm estimate — NOT MEASURED

11-15-88 4. Reamed Hole to 10" — 0 — 38?' B.G.L.

5. Set 40' 8" (?) of 8" Steel Casing @ ~38' B.G.L.

6. Cleaned Hole with 8" Hammer to 72', drilled to 74' B.G.L.

11-15-88 7. Pulled Steels Let Sit overnite

11-16-88 8. Water Level 9:00 AM 25'10" B.G.L. — Hole open to 74'

9. Set 71' 8" of 2" Stainless Steel @ 71' B.G.L.

✱ Screen Brushed Hydraulic Lines while setting in — THEY HAD BEEN DECONNED of OIL BUT SCREEN MAY HAVE SCRAPED A LITTLE RUBBER OFF.?

51' 8" of 2" Stainless Steel 0.020" SLOT SCREEN AND PLUG

7 20' of " " " CASING WITH CAP (TOP OF SCREEN 19' 4" B.G.L

10. SAND 74 - 19' (33 Bags Les - 5½ Bags M+E)

11. Bentonite — 19 - 16.5', Hydrated Bentonite w/5gal. H_2O (Altoona C

12. Pulled all 8" Casing, Pulled Rubber and Hat away from Hole

13. Pulled Rig off

14. Grout 16.5' — 3' B.G.L.

11-16-88 15. Set 6' Piece of 6" CASING WITH LOCKING CAP @ 4' B.G.L.

AR303654

DELTA RI/FS

11-88

Sept. 27, 1988

Logged & Samples by R. Pollok

Moisture Conditions, Blown Yield	Depth	Graphic Log	Lithologic Description	Drilling Conditions Hardness
Damp	0		COAL ASH	
	1		Lt. Orange-Brown coarse sand with a few conglomeratic sandstone fragments	Soft
			6" Hole w/Hammer 0-27'	
			10" Hole Ream 0-27'	
	7		Orange conglomeratic sandstone (Formation: Ridgely)	7
	9			1
	10		10	
			11 Little gray clay	
			Gray brown siliceous siltstone and silty clay loam (weathered siltstone) no effervescence	Med with zone
			15' Show of dark gray silty shale, weathered	
			~~Gray-Brown siliceous~~	
			Gray-brown siliceous siltstone 10-30' (Formation: Shriver?)	
	20		20.5	
Moist	Rod		Brown moist silt with a few limey horizons below 20.5-21	
Slightly Damp	Chg.		21 Gray-brown siliceous siltstone	Soft
			21.5 Effervescence @ 21.5	Med even
	27		27	
Nearly Dry			27' stopped, sniffed, checked for H_2O - Dry. Reamed to 27 w/10" [illegible]	
Dry	30		30	
			31 Gray fine-grained limestone	Hard
			Light gray brown siliceous siltstone	
			LIGHT	
	40			
Damp	Rod Chg.		42 Gray green weathered zone - Gray-[illegible] zone 42-44	Soft
	14		44	
			48.5 Black calc. shale	
	50		60	

AR303655

Delta RI/FS
11-88

Sept. 27, 1983

Moisture Conditions Blown Yield	Depth	Graphic Log	Lithologic Description	Drilling Conditions Hardness
Dry	50		Gray Calcareous Siltstone Check Chips	Med Soft
	60	Rod Chg.	62	
			68 Black Shale	
	70		70 Dark Gray Limestone Check chips to See How Pure	
			72 Gray Calcareous Siltstone 72-74	
Damp	74		74 Dark Gray Silty Shale to Siltstone with Pyrite Nodules, Non-Fissile, Non-Calcareous ← 76' } Poor Return	Soft
Wet 1-2 gpm →	75 76			
10 gpm?			Gastropods replaced w/Pyrite ← 78' Stopped @ 76' To get pump for trench Blew while setting up pump	
	80	Rod Chg	82-83 - Large chunks, weathered	82 83 Broke
			The lithology is more like Silt but has poorly defined bedding	
More H_2O 20 gpm?	86			
	90		T.D. 90'	90

Final Blown Yield 40 gpm - Rig Not Blowing at Full Throttle

74-90' [illegible]

AR303656

DELTA RI/FS
11 - 88

SEPT 27, 1988
R. POLLOK

Well Construction Details

1. 6" Pilot Hole with Hammer 0-27', Logged + Sampled
2. 10" Hole with Roller Bit - Reamed 0-27'
3.) Set 28' of 6" PVC Schem. 40 Flush-Joint threaded (10' lengths) casing @ 26'10" B.G.L., 27" A.G.L.
4.) Bentonite 3/8" Pellets 26'10" - 24' (~3' Seal)
5.) Hydrated Bentonite w/ 4 gal. H_2O 9-27-88 4:48 pm.
6.) 9-27-88 Grouted Hole to 22" B.G.L. Set 6' of 8" (8¼ I.D, 8⅝" O.D.) (w/ Locking Cap) Casing @ ~3½' B.G.L (29" A.G.L.) ← See Heidi's Notes
7.) 9-28-88 Drill 6" Hole (maybe 5⅞") 27'-76' stopped to set pump
8.) Developed Hole ~½ hour - Check Bob's Notes

DELTA RI/FS
12-88

Set upon Hole 5:20 Sept. 26, 1988
Logged and Sampled by R. Pollak,
on Rig - Doug, B. Hershey

Depth	Graphic Log	Lithologic Description	Drilling Condition
0		0 Yellow orange to Yellow Silt Loam	6" Hole with Hammer
2		Yellow - orange to Yellow Silt Loam	Soft
7		7 Pink clay @ 7'	
10		Yellow - orange to light orange silty clay loam and chert, some pink to red clay and orange silty clay loam to silty clay with iron oxide fragments	7 Med Hammer Not wo
14		14 Soft yellow moist silt - soft yellow moist silt	14 Soft
16		16 Red clay and yellow silty clay loam with chert	Poor Return, Moist No Blown
20		A few fragments of lavender siltstone. Red clay and yellow silty clay loam with chert, a few fragments of lavender siltstone	No Return Hammer Pushing, working on + off
		On drilling 10" hole thru this 20-28' interval we blew large 5 lb balls of yellow silt to silty clay loam	Poor Return
28		28 Weathered light gray-brown siltstone	28 Hammer works Medium
30		Formation: Shriver	
39		39	Stopped 6" Hole to Ream to 10" 40 + Set Casing
40		Weathered Gray-Brown calcareous siltstone with interbeds of tan limestone	Hard Medium with occass Hard Horizon
43.5	Rod Clay	Position of Limestones is diagramatic will be refined upon washing of samples upon	
49		Gray-Calcareous Siltstone and Fine to medium crystalline Limestone	

Damp to moist
Damp
Moist to wet
No Blown
Clay Balls
Silt Balls
Damp
Damp

AR303658

Delta RI/FS

12-88

, 1988

Logged and Sampled by R. Pollok

Structure Conditions Unyield	Depth	Graphic Log	Lithologic Description	Depth
	50		Gray Calcareous Siltstone	
			51 Gray Limestone	51
			52	52
Damp			Gray Calcareous Siltstone interbedded with gray finely to medium crystalline limestone. Distribution of limestone in graphic log is diagramatic – will be refine through washing of samples (Sampled almost every foot from 40 – 75')	
	60			
53.5	Rod Chg		Gray Calcareous Siltstone interbedded with gray finely to medium crystalline limestone. Distribution of limestone in graphic log is diagramatic – it will be refined through washing samples – samples were taken almost every foot from 40 – 75'	
	70			
<<1 gpm	75		Gray Non-Calcareous Siltstone (shriver)	75
After Sitting 5 min			T.D. 75' B.G.L.	
	80		Sample Soupy Gray Mud	
			1st Blown H_2O (std. @ 7.04): Sp. Cond. 225 @ 15.5 °C; pH 8.05 @ 16.4 °C; Blown Yield – <<1 gpm	
	90		Rig H_2O: Sp. Cond. – 210; Temp – 10°C	
			2nd Blown Water After Washing – Prob. Contam. w/ Rig H_2O: Sp. Cond – 210 @ 13°C; pH – 8.52 @ 13.8 °C	
	100		Final Blown Yield – <1 g	

Medium Hard

Medium with H layer

AR303659

DELTA RI/FS
12-88

Page 1 of 2

Oct. 6 & 7, 1988
R. Pollok

WELL CONSTRUCTION DETAILS

1. 6" Hole with Hammer 0 - 39', Logged & Sampled
2. 10" Hole with Roller Bit 0 - 39'
3. Set ~40' of 6" Flush-Threaded PVC sched. 40 Pipe @ 39'
4. Bentonite 39 - 37.5
5. Could Not Get Grout Tube in Annulus
6. Pulled Casing
7. Cleaned Hole Several Times with 10" Roller Bit - Pulled
10-6-88 8. Hole open to 33' Dry 8:30 A.M. ← H_{NU} - 0.2
9. Cleaned Hole with 10' Length of 10" Augers on Drill Steel, No Bit on End. 12:00 Noon ← H_{NU} - 0.2
10. Set 41' of 8" steel Casing (8⅛" I.D. 8⅝" O.D) @ 40' B.G.L. 1:30 ← H_{NU} - 0.2 Before Setting Casing
11. Drilled 40 - 75' H_{NU} - 0.2 After Drilling
12. Surged well Twice @ 10 min Intervals with Native H_2O - Took Sample
13. Washed well with Rig H_2O 30 min. H_{NU} - 0.2
14. Blew Well without Rig H_2O ~5 min. - Yield < 1 gpm
Took Water Sample Pulled Steels
15. Installed 25' of Stainless Steel Pipe and
51' 8" of Stainless Steel Screen (.020" slot) with cap and pl
77' 0" of Total Length, including cap + plug
Screen from 75' to 23' 4"
16. Stainless Steel Set at 74' 10" Below Original Ground Level
26" Stick-up to top of Stainless Steel Cap
17. Sand, Monrie (No 1?) - 75' - 40' (3" inside Casing)
10-6-88 Quit at ~8:00 P.M. Let Sit overnite.
10-7-88 8:30 AM 18. Resumed Sand Pack while Pulling Casing - Keeping Sand
Water Level 47' B.G.L. up in Casing at All Times @ well Bore, tin steel → H_{NU} - 0.3 Before Beginning Work
19. Sand 40 - 22'

AR303660

Delta RI/FS
12-88

Page 2 of 2

Oct. 7, 1988
R. Pollok, Doug + Matt
Funks Well D[illegible]

Well Construction

10-7-88 (20) Sand @ 22'4" Casing @ 22' BGL Poured in 1 Bucket of Bentonite and Pulled 41' "string" of Casing all at once. ← Hnu - .02 10:00 AM

10:00 AM Water Level 49.37' Below T.O.C. Stainless Steel

(21) Top Bentonite Plumbed @ 21'
Total Bentonite 22'4" - 20', 2 Buckets
(22) Hydrated Bentonite with 4 gallons of Altoona Water
(23) 1 hr After Hydrating Bentonite Pumped Grout
Grout 20' - 5' B.G.L.
(25) Set 6' of 8" steel (8⅛" I.D. 8⅝" O.D.) Casing @ 3' original B.G.L., 3' Stick-up (Above ori[illegible] Ground Lev[illegible]

(24.) Grout Mix ✓ 8 - 94 lb Bags
✓ ~46 gallons Altoona Water
✓ ~28 lb. Bentonite (Granular, Benseal) ½ B
~4% by Wt. (Little Less than 4%)
Brought Grout to 5' BGL
Mixed 2 more Bags to Bring Grout up to 2'
Mixed 2 Bags Sakrete to 6" B.G.L.

Total Cement - 10 Bags
½ Bag Benseal
2 Bags Sakrete

AR303661

DELTA RI/FS
13-88

Set up on Hole 5:40

SEPT. 26, 1988

LOGGED AND SAMPLED by
R. POLLOK

MOISTURE CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDIT. HARDNE
	0			
DAMP			WEATHERED GRAY LIMESTONE AND CHERT FRAGMENTS IN BROWN SILT LOAM MATRIX	MED. to Soft
			WEATHERED GRAY LIMESTONE AND CHERT IN BROWN SILT LOAM MATRIX	
	10			
MOIST	11.5			
			1ST Rock @ 17.7' in 6" Hole, 16.' in 10" Hole	14
				16
NEARLY DRY			17.7' Lt. Gray Brown to Gray Fine-Grained thin-bedded Limestone	MED.
			LIGHT GRAY-BROWN TO GRAY FINE-GRAINED THIN-BEDDED LIMESTONE 16-29'	
MOIST	20		20 / 20.5 Brown Silt Loam, weathered zone ~6"	Losing circulation 20
Slightly Damp	22.5		22.5	22.5
DAMP	24.5		24.5 YELLOW SILTY WEATHERED ZONE / YELLOW SILTY WEATHERED ZONE 22.5-24.5	SOFT
Slightly Damp			FORMATION: TONOLOWAY	MED.
	29		(29) (Minor copper? mineralization in cleanout 29-29.5 - See Sample)	29
	30		Before starting Rig Hnu - .01 %LEL - 000 @ 1:40 9-29-88	Set 6" PVC @ 29.5' B.G.L. 4" A.G.L.
MOIST	34		SOFT WEATHERED ZONE @ 34' / SOFT WEATHERED ZONE	MOIST Return
DRY			Lt. Gray thin-bedded Limestone	
	40		LIGHT GRAY THIN-BEDDED LIMESTONE	
	Rod Chg.			
	50			

6" Hole WITH HAMMER 0-29'

10" Hole REAMED 0-29'

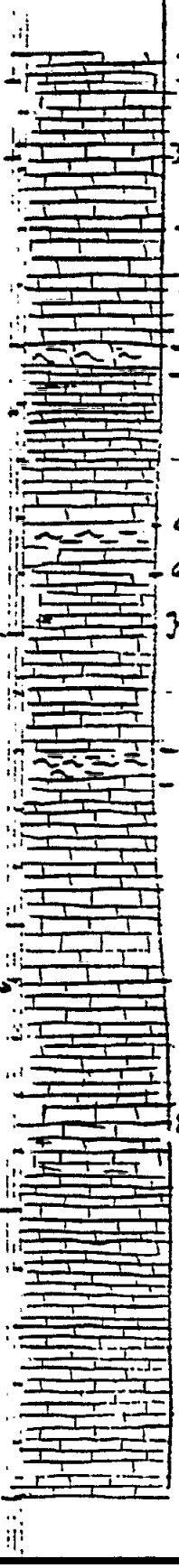
RETURN REDUCED Because of moisture

AR303662

DELTA RI/FS
13-88

9-29-88

MOISTURE CONDITIONS BLOWN YIELD	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
DAMP	50		} WEATHERED YELLOW ZONE — WEATHERED YELLOW ZONE 50-51'	SOFT
Dry	51			MED. SOFT
DAMP			} WEATHERED SILTY ZON [illegible]	
NEARLY Dry				
			LT. GRAY FINE GRAINED SLIGHTLY WEATHERED LIMES	56 Soft
			→ LIGHT GRAY FINE [illegible] LIMESTONE 50-66.5	54
DAMP	60		60 WEATHERED YELLOW BROWN LIMESTONE AND SILTY CLAY LOAM	HAR
Slightly Damp	61		61 WEATHERED YELLOW - BROWN LIMESTONE AND SILTY CLAY LOAM [illegible] 61	SOFT To Med. Soft
DAMP	66.5		66.5 } WEATHERED ORANGE-YELLOW SILTY ZONE YELLOW SILTY CLAY LOAM TO SILT LOAM — Check Chips — RETURN SLOWED 66.5	SOFT
SL. IP.	69		69 } LT. YELLOW SILTY ZONE — Poor Return	MED.
	70		LT. BROWN WEATHERED LIMESTONE. LIGHT BROWN WEATHERED LIMESTONE [illegible]	
MOIST	74		74 WEATHERED ZONE WITH YELLOW SILT AND REDDISH ORANGE PLASTIC CLAY 74	SOFT
? Poor Return	75		75 WEATHERED ZONE WITH YELLOW SILT AND RE[illegible] ORANGE PLASTIC CLAY 74-75 CUTTINGS ARE SILT + SAND SIZE 75	MED. S
DAMP	80			
	R.			
DAMP	87		87 CALCAREOUS LT. YELLOW SILT - WEATHERED LS	Soft
	90		? THIS [illegible] THE NATURE OF CUTTINGS	
			YELLOW-BROWN to Lt. BROWN Limestone, thin-bedded, fine-grained	
			[illegible]	
	100			

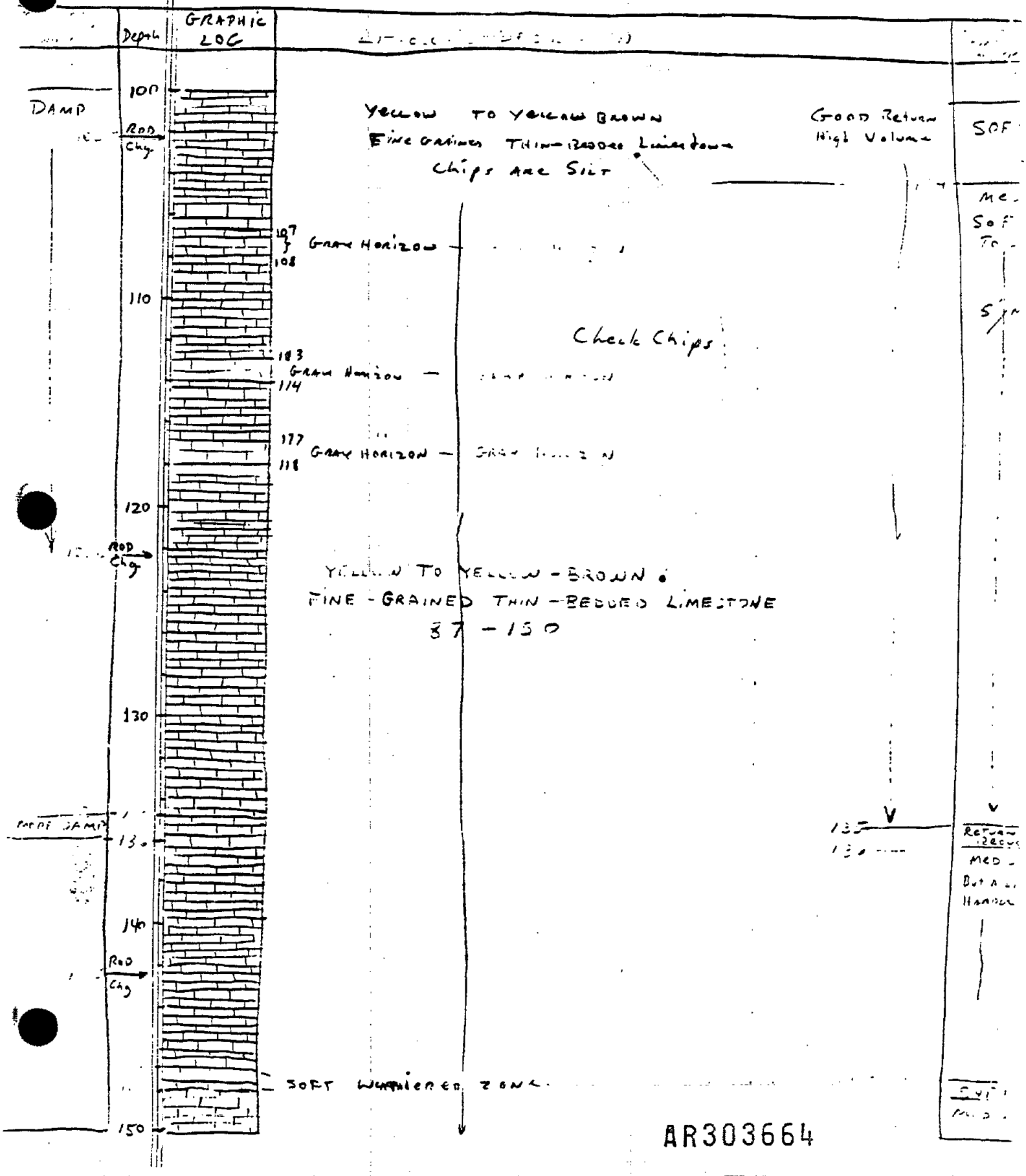


AR303663

DELTA RI/FS

13-38

9-29-88



AR303664

DELTA RI/FS

13-88

9-29-88

MOISTURE CONDITIONS	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS
DAMP	150		Fine-Grained Thin-Bedded Light Brown Limestone	SOF 6/m
			174	
	160			
MOIST				
			166	MED HARD
DAMP	170			
			174 Dark Gray Fine-Grained Limestone	
	180			
WET @ ROD chg	ROD chg		181	MED
3-4 gpm	190		T.D. 190' Final Blown Yield 3-4 gpm	

AR303665

Delta RI/FS
13-88

Well Construction Details

R. Pollok

9-26-88 1. 6" Pilot Hole 0-29' B.G.L., Sampled + Logged

2. 10" Reamed 0-29.5' B.G.L.

3. Set 30'4½" of 6" Sched. 40 PVC Flush-Joint Threaded Casing (in 10' lengths), male threads down, bottom three cut off.

Set @ 29'4½" B.G.L, 12" stick-up

4. 6' Length of 8" steel (8¼" ID, 8⅝" O.D) casing Set @ ~4' B.G.L., 27" A.G.L. (ie above bracket at ground level — will be set after grouting

5. Bentonite Seal 26'10" to 24'6" (2½' seal)

6. Hydrated Bentonite 9-27-88 400 pm with 4 gal. H_2O

9-27-88 7. Grout (Portland Bentonite Mix, see Bob's Notes) 24'6" — 1.5'

9-27-88 8) 6' of 8" (8¼ I.D., 8⅝" O.D.) steel casing Set @ 4' BGL, 2' AGL. w/locking c

9-29-88 9) Drilled 6" Hole (Hammer Bit ~ 5⅞") 29.5' — 190' B.G.L.

10.) Developed well with ~700 gallons of Rig Water (City of Alta

11.) Developed for ____ hours, check Bob's notes

12.) Grout Pad around 8" casing at surface

AR303666

Delta RI/FS
13-88

Nov. 3, 1988
R. Pollok

D-

Date	Time	Hnu	%LEL	% OX	Location of Measurement
11-3-88	12:45	0.0	000	20.9	inside steel 8" casing with cap partially removed
	12:47	0.0	000	20.9	Workspace 2' from Hole - Before Grout pour 3' to 0'

AR303667

Delta RI/FS

14-88

Sept. 30, 1988

D-5

Logged + Sampled by R. Pollon
Doug, Matt, B. Hershey on Site

Moisture Conditions, Blown Yield	Depth	Graphic Log	Lithologic Description	Drilling Conditions, Hardness
Slightly Damp	0		[illegible] Pink to Lt. Pinkish-Brown Silt and Siltstone	Med. Hard
	7		Shriver or Shriver Float	
Damp to Moist	7		Pink-Tan and Violet Silty Clay	Soft
	10		Pink-Tan and Violet Silty Clay	Very Soft
Moist Plastic	13		Black Silty Clay (Formation: Onondaga)?	
Very Damp Plastic	16			
	19			
	20	Rod Chg	(olive) Olive-Green Silty Clay to Silty Clay Loam (Dark Brown Band @ 21') Weathered Silty Shale ← Hau Explos	
			Olive to olive-Brown 22-25' (Formation: Onondaga)	
Very Moist Sample Balling up	25		Lt. Yellow-Orange Silty Very Fine-Grained Sandstone, Some Layers of Yellow Silt (Formation Ridgely)	Medium Soft, Little [illegible]
	30			
Damp			2" Gray Chert Bed @ 35' ← Hau Explosion.	Hard
	35		Gray Chert Bed 2"?	Reduced Returns
	36		Yellow Silt to Silty Clay Loam — Vague Relic Bedding, Dense-Firm	Soft New
	40	Rod Chg	? Formation: ? Weathered Shriver	
Moist	44		Orange and Brown Silt with Minor Chert	V. Soft
			Orange and Brown Silt [illegible] 44-47	
	47		Dark Brown Silt with Minor Chert and Occassional Layers of Brown Silty Clay	
	50		Dark Brown Silt with Minor Chert [illegible] Layers of Brown Silty Clay 47-[illegible]	

6" Hole w. Hammer 0-15

10" Ream 0-15'

10" Roller Bit 15'-75'

AR303668

D-

DELTA RI/FS

14-28

SEPT. 30, 1988

Logged + Sampled by R. Pollok

Oct. 3, 4

Moisture Condition, Blown Yield	Depth	Graphic Log	Lithologic Description	Drilling Condition Hardness
Moist Plastic	50		Dark Brown Silt with minor gray chert	V. Soft
			10" Roller Bit 50'-75'; 8" Hammer 75-85'	
			Poor Return must pull steels back every 2' and blow, bit probably pushing moist silt aside 50-71	
	59			
Rod Chg	60		Dark Brown Silty Clay Loam to Silt Loam	Soft
	64		Dark Brown Silt to Silt Loam	
? Moist/Damp				
	70		← some chips of Yellow-[illegible] Silt to V. Fine Sand	
	71		Gray Fine-Grained (Fresh) Limestone	71 Medium
Dry chips dry				72 Hard very hard
1-2 gpm			← Solution Features @ 75'	
			Petroleum smell characteristic of limestones 72-75; 75-85	
			Stopped for day @ 75' 9-30-88 1:00 pm	
			Set 76' of 8" steel casing @ 73' BGL	
	79		← Solution Features, some Yellow Silt 79-79.5'	Broken Hard
	79.5		Formation: Tonoloway 71.5'	
	80			
	83		Tan, more thin-bedded 83-85	
2-3 gpm			Tan more thin-bedded limestone 83-85	
	85		T.D. 85' B.G.L.	
	90		Final Blown Yield - 2-3 gpm 275 @ 16°C	
			100 P.M.: Sp. Conductance - 270 µmhos @ 15°C	
			Temp. - 15 °C	
			pH - 7.66 @ 13.1 °C; 7.86 @ 14.4 °C	
	100		Finish Drilling Noon 10-[illegible]	

AR303669

D-

DELTA RI/FS Page 1 of 3 Oct 1, 3, 4 1988

14-88 Installed by R. Pollok, B.H.

WELL CONSTRUCTION DETAILS Doug + MATT

DATE

1. 6" Hole with Hammer 0-15'

10-1-88 2. 10" Hole with Rollerbit 0-75' stopped to set 8" casing 10-1-

10-3-88 3:15 PM - PLUMBED DEPTH ~49' B.G.L. - DRY ← Hnu - 0.: %LEL - % O_2 - 2 Before Set Rig on H. 3:15 PM

" 3. CLEANED HOLE with 10" Roller bit without air

4. Set 8" casing to ~74' went in, to clean out

10-3-88 AND BLEW ABOUT 15 gallons H_2O - Stopped to Build Trench

10-4-88 4. WATER DATA - WATER BLOWN FROM HOLE AFTER SETTING CASING @ -

- MEASURED ON SAMPLE PONDED ON RUBBER MATT

SP. COND 315 @ 11.5 °C

10-4-88 5. EXPLOSIMETER READING 8:30 A.M. - % OXYGEN, 20.9

% LEL, 0.0

STANDARD ph 7 @ 7.0

10-4-88 CLEAN-OUT @ 74'. SP. COND 288 @ 14°C - pH 7.11 @ 14.2°C

10-4-88 CLEANED OUT to 73.5' Pushed Casing to 73' - CRIMPED END, changed Bit From Hammer to Roller bit, DRILLED OUT CASING.

* POSSIBLY GENERATED some steel Cuttings - very small Amount!

11:30-12:0 DRILLED 75-85' BLEW HOLE 1-2 gpm - 10 min.

1:00 PM @ 85'

SP. COND. 270 @ 15°C

% LEL - 0.0

% Ox - 20.8

pH - 7.66 @ 13.1 °C

7.86 @ 14.4 °C

MEASUREMENTS TAKEN after BLOWING 1/2 hr. 2ND TIME

1:00-1:30 Blew Hole @ 2-3 gpm for 1/2 Hr.

AR303670

DELTA RI/FS Page 2 of 2

14-88

WELL CONSTRUCTION DETAILS (CONTINUED)

10-4-88 2:55 (1) Set 60' of stainless Steel 2" .020" SLOT SCREEN
AND 25' of stainless Steel 2" CASING

(2) SAND 85 - 75.5'

(3) SLID PACKER (5" PVC sched. 40 with FLEXIBLE RUBBER FLANGES) AT
11½' B.G.L (ie, 1' BELOW WELDED joint in 8" CASING

PACKER MEASUREMENTS	
RUBBER PACKER	7½"
Steel	3' 5¾"
total Length	20' 2¾"
Bottom of Steel to top of PVC	19' 6¾"
Top of " " "	16' 1"

off Hole @ 5:00

10-5-88 (4) WATER LEVEL... ~ 8:30 A.M. - ~49.9' B.G.L.

(5) Reset Packer @ ~15' BGL, ~ 2' BELOW WELD

(6) SAND 75.5 - 57'

(7) Cut CASING off @ 60' 3" - Pulled Packer, Some Steel cutting
FRAGMENTS Went Down 8" CASING into SAND Pack

(8) Reinstalled Packer

(9) SAND - 57 - 47'

(10) Cut off 9' of 8" steel CASING, Pulled Packer, More Steel cut in SAND

(11) SAND 47 - 35 Installed Packer

(12) Cut off 11' of 8" Steel CASING, Pulled Packer, MORE STEEL cutting

(13) SAND 35 - 23, Installed Packer

(14) Cut of 12' of 8" Steel CASING, Pulled Packer, MORE Steel cutting IN WELL - on SAND

(15) SAND 23 - 21'

AR303671

Delta RI/FS
14-88

(16) Bentonite Pellets (3/8") 21-19', Pulled Casing to 18'9"
Hydrated with 4 gallons of H_2O

(17) Poured Grout (94 lb Portland Type I : 3 lb Bentonite Granular : 6 gallons
Mix inside Casing (10 gallon)

(18) Pulled all 28' of Casing out

(19) Grout pumped in thru 1" Hole to 1' B.G.L.

(18) Set 6' Length of 8" Steel Casing @ 3½' B.G.L.,
with Locking Cap

Materials:

Sand - 28 Bags
Benseal - ¼ bag
Bentonite Pellets - 2 Buckets
Portland Cement - 7 Bags

1 - Locking Cap 8"
1 - 6' of 8" Steel Casing
1 - Stainless Steel Cap
1 - " " Plug
25' - " " 2" Pipe
60' - " " 2" .020" slot screen

AR303672

DELTA KI/FS
15 - 82

OCT. 24 1988

LOGGED AND SAMPLED BY R. Pollo

...RE ...TIONS, SLOWNYIELD	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DRILLING CONDITIONS HARDNESS
	0		DARK BROWN SILT LOAM HUMIC LAYER (PLOW LAYER) 0-1	
DAMP	1		DARK BROWN SILT LOAM HUMIC LAYER (PLOW LAYER)	
DAMP			YELLOW SILTY CLAY LOAM, NO C.F., PLASTIC (FIRM). NO COARSE FRAGMENTS	SOFT FIRM
	7.5		7.5	7.5
DAMP to moist	10		DARK BROWN AND BROWN SILTY CLAY LOAM with (SOFT AND PLASTIC) MINOR GRAY AND BLACK CHERT FRAGMENTS CHERT FRAGMENTS	SOFT
			DARK BROWN SILT LOAM 20-22	
			21-22 SOME CHIPS OF BLACK AND WHITE SILTSTONE WITH MANGANESE OXIDE MINERALIZAT...	
	20		DARK BROWN SILT LOAM 20-22	
MOIST	22		21-22 Some chips of Black & White SILTSTONE WITH MANGAN (WEATHERED SHRIVER)	
			CHERT BLOCK @ 26.5	
			Chert Block	27.5
			1ST ROCK @ 31	Soft
	30			
DRY	31		31 Lt. Gray thin-bedded Limestone (Fine Grained)	MEDIUM
			LIGHT GRAY THIN-BEDDED FINE-GRAINED LIMESTONE	
MOIST	38		38 BROWN SILT LOAM AND WEATHERED LIMESTONE	SOFT
	39		39 BROWN SILT LOAM AND WEATHERED LIMESTONE	MEDIUM
DAMP to MOIST Sample ...	40			
	42'	ROD CLAY		
			48'	
			10-25-88 9:00 AM WATERLEVEL - DRY	
			10-25-88 Hnu - 0.0 %L.E.L - 000 %O Before Drilling	
			48'	
	50			

AR303673

DELTA RI/FS
15 - 88

OCT. 25, 1988

D-1

Blowing Yield	Depth	Graphic Log	Lithologic Description	Drilling Conditions
			LIGHT GRAY TO GRAY-BROWN SLIGHTLY WEATHERED TO GRAY-BROWN	
Cuttings Nearly Dry	50		Lt. Gray Slightly weathered thin-bedded Fine-Grained Limestone	Med
			THIN-BEDDED, FINE-GRAINED LIMESTONE	Somewhat Uneven
Very Damp	54.5		54.5 — MORE WEATHERED GRAY AND TAN LIMESTONE	
			MORE WEATHERED GRAY AND TAN LIMESTONE 57'	Return Reduced Because of Moisture
			59	
	60		LIGHT GRAY THIN-BEDDED FINE-GRAINED LIMESTONE 59-76', EXCEPT 64'	
62.4' Rod Chg. Damp to Moist			LT. GRAY THIN-BEDDED FINE GRAINED LIMESTONE FOR SILT HORIZONS @ 67-69 AND 70-72	
Cuttings Dry	64			
Damp	66			
Moist to Wet	67		67 — Yellow Brown Silt	67 — Very Soft
			YELLOW-BROWN SILT 67-69	69 — Med
			LIMESTONE	70 — Very Soft
	70		70 — Yellow-Brown Silt	
Blown Water (Just Mud Balls)			YELLOW-BROWN SILT 70-72	72 — Med
			WEATHERED ZONE 74.5-75	
	74.5		74.5 — WEATHERED 74.5-75	74.5 — Med/Uneven
			75	
	76		T.D. 76'	76
			76'	
	80		10:15	@ 76' 10:00 Hnu - 100ppm in Hole Quantitative
			Hnu - 1' From Hole 0.0	% LEL 000
			Hnu -	% OX - 20.9
				100ppm took a long time 1½ min. to go from 0-100
				Probably Hammer oil mist in Hole, Put on Rollen Bit and Blew it out and Rechecked Hnu -
	90			11:10 Hnu - >50 Slowly Rising
				% LEL - 000
				% OX - 21.0
			After sitting	12:00 Hnu - 0.0 in Hole
				- 0.0 1' From Hole
	100			

WATER SAMPLE
Water Sample
Blown from Well
2:10 P.M. 10-25-88
7.08 pH 10.0°C
170 µmhos

Poor Return Samples "Balling-up" 67-76

AR303674

DELTA RI/FS

15-88

OCT. 25, 1988

Drilled Depth	HNU	Loc. of Reading	% LEL	% OX	Time	Sp. Cond. µmhos	Temp	pH	Comments
48'	0.0	Under Table, in Hole	000	20.9	9:0AM	—	—	—	Before Drilling
76'	1.0	in Hole		20.9	10:15 AM	—	—	—	After Drilling
76	0.05	1' Above Hole		20.9	10:15	—	—	—	"
	50	in Hole				MUST BE HAMMER OR COMPR. OIL			
76'	0.05	1' Above Hole		20.9	11:10	—	—	—	After Blow Hole 20 min
	0.0	in Hole	000	20.9	12:00	—	—	—	After sitting 1 hour
	0.0	1' Above Hole	000	20.9	12:00	—	—	—	"
76'	0.05	Under Apron	000	20.9	12:15	—	—	—	While Blow Hole
76'	0.0	in Hole	000	20.8	1:50	—	—	—	
	0.0	in Hole							
76'	0.0	1' Above Hole	000	20.9	1:55				As Pipe was Being Installed
76'	0.0	1' Above Hole	000	20.0	2:30				As Sand was Being P[illegible]
76'	0.0	1" Above Hole & Pipe	000	21.0	3:00				Pipe Sa[illegible] Bentonite [illegible] to 23'

AR303675

RI/FS
15-88

Oct. 25. 1988

Well Construction Details

1. 8" Hole with Roller Bit 0 - 48'
2. 8" Hole with Hammer 48' - 76'
3. Cleaned and Developed Hole with Roller Bit 1 hour
   400 gallons taken to Tank ← (This is 90% Rig H_2O, Altoona City
4. Blew Hole 1 more Time to Get Sample for pH << 1/2 gpm
5. 30? gallons taken to Tank (90% Altoona City H_2O)
6. Set 51' 8" of 2" stainless Steel .020" slot wellscreen w/ Plug
   and 25' 1" of 2" " " Casing + cap
   @ 75' 2" Below Ground Level 76' 9" minus 19"
   " = 1'
7. Top of Screen @ 23' 6" B.G.L
8. Morie #1? Sand 72' 2" to 23'
9. 1 Bucket Bentonite 23 - 20.5' (measured) 3/8" Cylyonic Pellets
10. Hydrated Bentonite with 3 gallons of Altoona City H_2O
10-25-88 7:30 AM
11. Grout - 20.5' to 3' B.G.L.
    " Mix: 8 - 94 lb Bags Portland Type I, ~42 gal. H_2O, 25 lb Granular Bentonite

Water Level - 3:00 PM 74' Below T.O.C. Stainless (~72.5' BGL

AR303676

D-

DELTA RI/FS

Nov. 16, 1988

15A -88

Drilled Logged + Sampled by R. Pol

	GRAPHIC LOG	LITHOLOGIC DESCRIPTION		
DAMP	0	0 1 Yellow Silty Clay Loam No C.F. NO [illegible] FRAGMENTS	6" Roller Bit 0-28'	SOF
DAMP to Moist		4 NO COARSE [illegible] Brown to Dark Brown Silty Clay Loam, No C.F. [illegible] DARK GRAY CHERT [illegible] with occasional Dark Gray Chert Chips.	10" Roller Bit 0-38'	SO to [illegible] Sof.
	10	This interval 4-23' is probably weathered shriver (residuum)		
MOIST	20	1st Rock FIRST ROCK		
DRY	23	23 Lt. Gray to Tan Finely-crystalline Limestone LIGHT Thin-Bedded	23	MEDIUM UNEVE MEDIUM
	30	WEATHERED LIGHT BROWN SILTY - [illegible] ZONE		
DAMP DRY	31	31 } WEATHERED LT. BROWN SILTY LIMESTONE ZONE 32		
		35 GRAY FINELY-crystalline THICKER BEDDED LIMESTONE	35	HAR
DAMP		38' ← Stopped to Set PVC [illegible]		
	40 40.5 ROD	39 40 } TAN WEATHERED F.G. Limestone (weathered) FINE-GRAINED [illegible]		
	50			

AR303677

D-

Delta RI/FS

15A - 88

Nov. 18, 1988

Logged and Sampled by R. Pollol

Moisture Condition	Depth	Graphic Log	Lithologic Description	Drilling Condition
	50		FINE-GRAINED LIMESTONE	
Dry			LIGHT Lt. Gray to TAN F.G. LIMESTONE	Med. even Drill
→ 60.5	60			
DAMP	62		FINE-GRAINED	
			62 WEATHERED ZONE, YELLOW-BROWN LIMESTONE F.G. 62	SOFT
			63 TAN to YELLOW BROWN WEATHERED LIMESTONE 63	Med. to Med. SOFT A Lit. Unc.
			TAN TO YELLOW-BROWN WEATHERED LIMESTONE	
	70			69 Med.
Moist to WET <<1g BM@71'	71		71 ← Stopped 10 min to Measure H_2O Data	
			STOPPED TEN MINUTES AT 71' TO MEASURE WATER DATA	
	80			
RED CHANGE			ORANGE WEATHERED ZONE, WEATHERED TAN LIMESTONE	
	85		85 Orange WEATHERED ZONE WEATHERED TAN LIMESTONE 85	SOFT
WET			86	Med.
			TAN AND GRAY Finely-crystalline Limestone	
Drying up as drilling	90		TAN AND GRAY FINELY-CRYSTALLINE LIMESTONE	
DAMP				
Slightly Damp	92		92	Med. Hard to Med.
			DRYING UP AS DRILLING 8x-92'	
	100			

AR303678

D

DELTA RI, FD

15A - 88

11 OV. 18 1988

Depth	Graphic Log	Lithologic Description	Drill Condition
100		WEATHERED ZONE 100 - 100.5	
		WEATHERED ZONE 100 - 100.5	WET AFTER ROD CHG.
		Gray to Gray Brown	
		WEATHERED TAN TO YELLOW LIMESTONE WITH SILT HORIZONS	
109		WEATHERED TAN TO YELLOW LIMESTONE WITH SILT HORIZONS	
111		GRAY AND TAN FINELY-CRYSTALLINE LIMESTONE with Some Mineralization (Calcite veins @ 112-114	
		GRAY AND TAN FINELY - CRYSTALLINE LIMESTONE WITH SOME MINERALIZATION (CALCITE VEINS @ 112 - 114)	
113		Brown to Gray-Brown Very Finely - Crystalline (cherty appearance) Limestone	
		BROWN TO GRAY-BROWN VERY FINELY CRYSTALLINE (CHERTY APPEARANCE) LIMESTONE	
124		TAN AND YELLOW BROWN VERY WEATHERED LIMESTONE, F.G., Solution Features, CLEAR CALCITE MINERALIZATION, AND YELLOW ORANGE SILTY CLAY	
127		GRAY BROWN to BROWN Finely Banded VERY FINELY - crystalline Limestone	
130		130' T.D. (2.95' stick-up A.G.L.)	

DAMP WET 100.5 ROD CHG

Rig H_2O

120.5 ROD CHG.

MORE H_2O 124-127

10-12 gpm

124 - 127
TAN AND YELLOW-BROWN VERY WEATHERED LIMESTONE, FINE-GRAINED, SOLUTION FEATURES, CLEAR CALCITE MINERALIZATION, AND YELLOW-ORANGE SILTY CLAY

Final Blown Yield - 4-5 gpm

Sp. Cond - 220 µmhos @ 14.7

pH - 8.18 @ 14.7

Hnu - 0.1

% LEL - 000

% OX - 20.8

Water Level - 80.83' 2:50 P.M.

2.95' stick up - 8" casing

ACOVE

AR303679

[illegible] I/FS

15A-88

Nov. 17, 18, 1988

Data Collected by R. Pollok

	Time	Drilled Depth	Location of Air Measurement	Hnu	% OX	% LEL	Blown Yield	Sp. Cond. µmhos	pH	Comments
11-17-88	9:00	0'	@ Table	0.2	21.0	000	—	—	—	R[illegible] Before Dr[illegible]
	9:20	28'	@ Table	0.2	21.0	000	—	—	—	[illegible]" OD [illegible]
	11:45	38'	@ Table	0.1	20.8	000				Hole
			+ in Annulus	0.1	20.8	000	—	—	—	While Set[illegible] 8" Casing
11-18-88	9:00	38'	@ Table	0.2	20.8	000	—	—	—	Rig On Not Blowing
	9:15	60.5'	in Hole	0.2	20.8	000	<<1 gpm	162 @ 13.2°C	7.59 @ 12.7°C	Thick Mud
	9:45	80.5	in Hole	0.0	20.9	000	—	—	—	Rig On, No Blowing
	9:45	80.5	@ Table	0.0	20.9	000	—	—	—	
	10:00	100.5	in Hole	0.1	20.9	000	<<1 gpm	182 @ 15°C	7.70 @ 15°C	Thick Mud
	10:10	100.5	@ Table	0.1	20.9	000	—	—	—	Rig On Not Blowing
	10:45	120.5	@ Table	0.1						
			in Hole	0.1	20.9	000	~1 gpm	209 @ 15.8°C	8.04 @ 15.1°C	Rig On Not Blowing
	11:15	130'	—	—	—	—	10-12 gpm	212 @ 13.5°C	8.22 @ 13.7°C	Rig On
	11:30	130'	—	—	—	—	4-5 gpm	220 @ 14.7°C	8.18 @ 14.7°C	Rig On
	11:45	130'	in Hole	0.1	20.8	000	—	—	—	Rig OFF
	12:30	130'	in Hole	0.2	20.8	000	5-6 gpm	202 @ 13.2°C	8.28 @ 13.4°C	Water Low @ 90' Bgl Before Blow
11-18-88			2:40 PM Water Level - 80.83' Below 8" TOC. 2.95' stick-up							

AR303680

DELTA RI, FI Nov. 17, 18 1988

15A - 88

Well Construction Details

11-17-88 1. Drilled 6" Hole w/Roller Bit 0-28'

2. Drilled 10" Hole w/Roller Bit 0-38'

3. Set 39' of Flush-Joint Threaded Sched. 40 PVC Casing @ 37.5' B.G.L., Bentonite Pellets 37.5' - 35'

4. Grout in Annulus 37.5' - 3' B.G.L. * Settled to 7' B.G.L.

Grout Mix: Portland Type I Cement - 10-94 lb. Bags

Benseal Granular Bentonite - 35 lb

Water (Altoona City H_2O) - 5½ gal./Bag.

5 Set Protective Casing (8") with Locking Cap (Lot Cap Temporarily over top ...

11-18-88 6. Drilled 6" Hole with Hammer 38' - 130' B.G.L.

7. Blew Hole @ 120.5' for 15 minutes

8. Blew Hole @ 130' for 15 minutes 12:30 80% Hole 450 gallon

9. Pulled All Steels, Casing Muddy inside

10. Put Steels Back on Bottom, Blew 25 min. more. 1:30 100% Hole 150 gal. To

11. Total of 600 gallons of Water Taken to Tank

12. Sakrete, Concrete Mix 7' to 0' B.G.L.

13. 6' Length of 8" Steel Protective Casing with Locking Cap Set @ 3' B.G.L., 2.95' "stick-up"

14. Sakrete Brought to Surface in Round Pad

AR303681

DELTA RI/FS
16 - 88

Projected Depth - 56'
Screened Well

Nov. 10, 1988
LOGGED + SAMPLED by Pollak

Structure Conditions, Blown Yield	Depth	Graphic Log	Lithologic Description		Drilling Condition
Very Damp	0		YELLOW SILT LOAM WITH SHRIVER SILTSTONE FRAGMENTS (COLLUVIUM)	6" PILOT HOLE WITH HAMMER 0-41'	SOFT
	5		Yellow Brown to Lt. Brown Silt Loam to Silty Clay Loam		
	10		YELLOW - BROWN TO LIGHT BROWN SILT LOAM TO SILTY CLAY LOAM	POOR RETURN BUT NO MUD 10-29'	
	17		Yellow ~~weathered Siltstone~~? Shrivers?		Very Soft
21 - Rod	20		PROBABLY CLAY LT. GRAY? → 17-29'		
Dry			~~Lt. Gray Clay and~~ Weathered Dark Gray Shale		
			LIGHT GRAY CLAY AND WEATHERED DARK GRAY SHALE 17-29		
Dry? But [illegible] NO MUD BALLS	29		DARK GRAY TO BLACK SILTY SHALE	VERY POOR RETURN 29-41	Soft
	30		High CLAY CONTENT DARK GRAY TO BLACK SILTY SHALE 29-37		
	34		Dark Gray to Black Shale		Med. Soft
	37		CLAY OR WEATHERED SHALE 37-40		Soft
			CLAY OR WEATHERED SHALE 37-40		
41 Rod Chg.	40		DARK GRAY to BLACK Shale No Pyrite Non Calcareous		Med. to Med. Soft
			DARK GRAY TO BLACK, NON-CALCAREOUS BLOCKY SHALE NO PYRITE	GOOD Return	
			← 46' Brachiopod? Fossil		
			CARBONATE IN SOME LIMESTONE		
	50		[illegible]		

AR303682

D.

DELTA RI/FS

16-88

Nov. 11, 1988

LOGGED AND Samples by R. Pollok

...TURE CONDITIONS,	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DR... CONDI... HARD...
Rig H_2O	50		DARK GRAY to BLACK SILTY SHALE (BLOCKY RATHER THAN FISSILE) No OBSERVED Pyrite Non-Calcareous	MEDI...
			-54 GRAY SILTY SLIGHTLY MICACEOUS PLASTIC CLAY	54
			-55 CARBONACEOUS in SOME HORIZONS	55 SOFT
			-57 GRAY SILTY SLIGHTLY MICACEOUS PLASTIC CLAY	MEDIUM
			-58	SOFT
	60		58' GRAY SILTY SLIGHTLY MICA... PLASTIC CLAY	
			DARK GRAY TO BLACK SILTY BLOCKY NON-CALCAREOUS, NON-PYRITIFEROUS SHALE 55-57	
	70		BLOWING AIR BACK INTO FORMATION AT ABOUT 30-40'	
	80		BLOWN YIELD ? > 2 gpm	

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DELTA RI/FS

16-88

Nov. 11 1988

WELL DATA

Date	Time	Depth Drilled	Location of Air Measurement	HNu	%OX	%LEL	Blown Yield	Sp. Cond. µmhos	pH	Comment
11-10-88	5:00	0	@ Table	0.2	21.0	000	—	—	—	Before Beginning Hole
	5:10	21'	@ Table	0.2	21.0	000	—	—	—	Rig Running Not Blowing
	5:10	21'	in Hole	0.2	21.0	000	—	—	—	"
	5:30P	41'	in Hole	0.4	21.0	000	H_2O Rising in 6" Hole @ 2'/min.	—	—	RIG OFF Steels OUT
11-11-88	10:00A	41'	in Hole	0.3	21.0	4' in hole 000	—	—	—	Static H_2O @ 10
			AT TABLE	0.3						Water Bubbling Air
	10:00A	41'	Background	0.3	21.0	000	Air + H_2O Blown into Hole	28° @ 11° C	5.27 @ 9.8° C	Water Purged from Hole 0-21
			@ TABLE	0.0	21.0	000				8" Roller Bit used
	12:45	58'	Background	0.0	21.0	000	Ran Rig H_2O ?	—	—	to Drill 41-58
	1:00	58'	in Hole	1.0 to 0.8	21.0	000	—	—	—	
	2:45	58'	WATER LEVEL — 14' Below TOC Stainless and Rising							Measured inside Stainless Steel

AR303684

DELTA RI/FS Nov. 11, 1988

16-88

WELL CONSTRUCTION DETAILS

11-10-88

1. 6" Pilot Hole with Hammer 0-41'
2. Pulled Steels to Look at Bit
3. Hole was gurgling - Formation pressurized ~30-40'
   Water Rising Above Pressurized Zone, 18'+ Rising @ 5:30PM

11-11-88

4. Static H_2O Level 10' B.G.L. 10:00AM - Hole Bubbling a little
5. Blow H_2O from Hole with 6" Hammer, Lost air @ 21'
6. 8" Roller Bit 0-58' Blow 5 min @ 58' Water Pretty muddy, lots of cla
7. Set 2" Stainless Steel Casing and Screen @ 56' B.G.L.
   5'8" of 2" Stainless Steel .020" slot screen with Cap
   and 5' of 2" " " Casing.
8. Sand in 8" Hole 58' - 4½' B.G.L.
9. Bentonite 3/8" pellets 4½' - 2½' B.G.L. 1½
10. Sakrete 2½' - 0
11. 5' Length of 6" Steel Casing Set @ 2½' B.G.L. with Locking

* After drilling 58' water was NOT cascading in from above

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D-

DELTA RI/FS
17-88

PROJECTED DEPTH 48'
" SCREEN 4/1'8"
" RISER 5'

NOV. 21, 1988
22'

[illegible] CONDITIONS, BLOWYIELD	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION		DRILLING CONDITIONS [illegible]
	0		[illegible]		
DAMP			BROWN LOAM HUMIC LAYER	0-48' 10" Hole w/ROLLER BIT	[illegible]
			YELLOW-BROWN LOAM TO SANDY LOAM		
			[illegible]		
	5		TAN TO YELLOW/TAN FINE-GRAINED TO VERY FINE GRAINED LOAMY SAND		
	10		[illegible]		
MOIST	13		[illegible] LOAMY [illegible] 13'		VERY SOFT
				CUTTINGS SMALL [illegible]	
POD	20				
	22'		A FEW FINE GRAINED SANDSTONE BLOCKS		
			YELLOW-TAN TO TAN FINE-GRAINED SAND WITH A FEW FINE-[illegible] SAND[illegible] FRAGMENTS. 22 [illegible]	CUTTING BIG ? LUMPS OF WET SAND	
	30				
	32		PINKISH-TAN FINE-GRAINED SAND WITH A FEW FINE GRAINED TAN SANDSTONE FRAGMENTS (1")		
POD	40		PINK[illegible]-T[illegible] SAND [illegible] TAN [illegible] SAND[illegible] 11	CUTTING THICK WET SAND NOT YET FLOWIN BUT VERY WET	
	47		T.D. 47'	47	
	50				

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DELTA RI/FS

WELL DATA

17-88

Nov. 22 1988

DATE	DEPTH DRILLED	LOCATION of Air measurement	Hnu	%OX	%LEL	BLOWN YIELD	SP. COND. µmhos	pH	Time	COM[illegible]
11-21-88	0'	@ TABLE Background	0.2	20.9	000	—	—	—	9:30	Before [illegible]
	47'	workspace AT TABLE	0.3	20.6	001	—	—	—	10:30	[illegible]
	47'	in Hole	0.3	20.6	001	—	—	—	10:30	
	47'	in 8" Casing	0.3	20.6	001	—	—	—	11:1[illegible]	RIG ON [illegible] set @ 15 - Before Welding
		—	—	—	—	—	—	—	—	
	47'	—	—	—	—	Cased off <<1 gpm	89 @ 11°C	6.44 @ 10.4°C	12:15	[illegible]
	47'	@ TABLE Above Casing	0.2	20.7	000	—	—	—	1:30	8" CAS[illegible] 46' BG
	47'	@ GROUND Beside Casing	0.2	20.8	000	—	—	—	4:30	8" CAS[illegible] TO 20'

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DELTA RI/FS

17-88

Nov. 21, 1988

WELL CONSTRUCTION DETAILS

1. 10" Hole Drilled with Roller Bit 0 - 46'
2. Set 50' of 8" Steel Casing @ 46' B.G.L.
3. Cleaned out with 6" Hammer 0-47' Drilled 1' more
4. Cleaned out with 8" Roller Bit 0-47' Drilled 1' more
5. Pulled Steels and Set 2" Stainless Steel @ 47' B.G.L.
   41'4" of 2" Stainless Steel .020" slot screen with [illegible]
   6'9" of 2" " " Casing, No Plug at top [illegible]
   48'1" Total Length, Set @ ~47' B.G.L.
   Top of Screen @ 5'8" B.G.L.
6. Sand* 47' - 5'2", Sand Measured 6" over Screen 4'2" top [illegible]
7. Bentonite (3/8" Pellets) 5½' - 3' B.G.L.
8. Sakrete 3' - Surface
9. 6' Length of 6" steel Casing Set at 3½' B.G.L.
   with Locking Cap (Lock Protector not on yet) and Lock

* Sand was put inside 8" casing as it was pulled so that stainless was never in touch with collapsed material. Casing was cut off every 10' with casing cutter so that no metal "beads" entered hole

DELTA RI/FS

18-88

OCT. 31, 1988

Logged + Sampled by R. Pollak

Doug + Matt of Funk's Well Drilling

Moisture Conditions Blown Yield	Depth	Graphic Log	Lithologic Description	Drill
			DARK [illegible] AND SAND [illegible]	
DAMP	0		DARK BROWN LOAM, 10% CF. of Siltstone and Sandstone	SOF
			TAN TO YELLOW-BROWN slightly Mottled Loam to Silt	
			LOAM with 10-20% CF. of Siltstone SandStone and	
	14.5		Chert — (COLLUVIUM)	
VERY DAMP			YELLOW-BROWN TO LIGHT ORANGE FINE-SILTY SAND (LOAMY SAND NO C.F.)	SOF to Very SOFT
			8" Roller Bit 0-	
	8			
	10		TAN TO PINK FINE TO VERY FINE-GRAINED	
			SILTY SAND (LOAMY SAND)	
			[FORMATION: RIDGELY]	
			pH 5.02 @ 11.6°C	
			Sp. Cond. 50 @ 12.5	
LT <<1gpm	20		20'	
			BLEW ABOUT 5 gallons of H_2O after sitting 5-10 min — Enough to Sample + Test	
	28		TAN TO Light-orange-Brown FINE-GRAINED SILTY SAND	
	30		SOME CLAY LOAM HORIZONS MORE HEMATITE STAINING	
			(Some Lt chunks show white loam with orange and	
	33		Red Ironstained streaks, Relic Beds?)	
			COARSE AND MEDIUM-GRAINED Pink to Lt. Orange Silty SAND WITH CONGLOMERATIC ZONES Up to 1/8" Pebbles	
	40			
FOAM + 42.5 RIG H_2O	41		41 — LT. ORANGE CONGLOMERATIC SANDSTONE, WEATHERED	MEDIUM
			* CUTTINGS AND WATER ARE TOO THICK TO PUMP - 41-62.5' SO ALL WATER WENT WITH CUTTINGS TO PIT	
			Return Mixed, Difficult to Interpret	
RIG H_2O ONLY			LIGHT ORANGE COARSE-GRAINED	HARD
	50		TO [illegible] VERY WEATHERED SANDSTONE 41-52	

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DELTA RI/FS

18-88

Nov. 1988

Logged and Sampled by R. Polick

on Drill - Doug and Matt of Funk's Well Drill

Moisture Conditions	Depth	Graphic Log	Lithologic Description		Drilling Conditions
Rig H_2O	50		Lt. Orange Coarse to Conglomeratic Sandstone (very weathered - casing push through 8 7/8" Hole)	Return Mixed	Hard
Blown mud no water	52		[illegible] FINE- [illegible] [illegible] 52-53	Difficult to Interpret	Med. to Soft
	58		[illegible]	Life Staining	Soft
	60		61 Very Coarse? Grained to Conglomeratic Sandstone to Sand (weathered - casing Pushed through it)		Hard to Med. a little uneven
62.5 Rod Chg. 3-4 gpm			63 ← Casing set @ 63 while drilling 69-82.5	← 3-4 gpm Blew 5 min	
Still using some Rig H_2O			VERY COARSE-GRAINED TO CONGLOMERATIC SANDSTONE TO SAND 60-72'		
3-4 gpm			FLOWING SAND NOW @ 69'	← 3-4 gpm while Blowing, Rig H_2O off	
	70		72' ← BOUNDARY UNCERTAIN		
			89 TAN Fine-Grained Silty Sand Dense, Blocky, But Very Friable	Return Mixed D	Medium even
			Blowing thick mud TAN FINE-GRAINED SILTY SAND, DENSE, BLOCKY BUT VERY FRIABLE 72-94		
	80		White and Red Silty Horizons ~ 80-82 WHITE AND RED SILTY HORIZONS 80-82		
Rod Chg. After Setting casing ~ 0.3 gpm leaking by?	82		TAN Fine-Grained Silty Sand		
	90		94' VERY COARSE TO CONGLOMERATIC SAND 94-[illegible] Very Coarse-Grained to Conglomeratic [illegible]		Very to Uneven
20 gpm ?			Blown Yield may be much Higher		
	100		Flowing Sand Reduces velocity and volume		

AR303690

DELTA RI/FS
18-88

Nov.
Logged and Sampled by
R. Pollok - Doug + Matt

...ture Conditions	Depth	Graphic Log	Lithologic Description	
20 gpm ?	100		Very coarse-grained to conglomeratic sand	Very soft uneven steel jum...
	102.5		Rotation uneven	
	110			
	120		120' ← Proposed top of screen	
	130			
	140			
	150			

AR303691

D-

Delta RI/FS Page 1 Oct. 31, 198[illegible]

Well Data Data Collected by R. Pollok

18-88

Date	Time	Hnu	% LEL	% OX	Hole Depth	Location of Measurement	SP (mmhos) Cond	pH	Brown Yield	Comments
10-31-88	5:00P	0.4	000	21.0	20'	6" Above Hole	50 @ 12.5°C	5.02 @11.6°C	<<1gpm	Water is T[illegible] mud, tan
0-31-88	5:30P	0.4	000	20.9	20'	Top of 10" casing (HAT)	—	—	—	Rig shut [illegible] for dat
11-1-88	9:15P	Background 0.2	001	21.1	20'	@ T.O.C. (HAT)	Static water level - 13.1' BGL 9:15 AM			H_2O Lev[illegible] taken bef[illegible] drilling
	"	—	000	21.1	20'	Under apron				
	9:40	0.2	—	—	20'	2" Below T.O.C. (HAT)	30 @ 10.25°C	6.26 @10.2	—	Water dr[illegible] @ 11:00 AM
	~11:30	—	000	20.9	42.5'	"	—	—	—	Rig off
	12:00	—	001	20.9	48'	"	—	—	—	Rig off
	12:20	0.4	001	20.9	50'	"	—	—	—	Rig off
	12:20	—	000	20.9	50'	1' From hole	—	—	—	
	12:30	.2	001	21.0	62.5'	2" Below T.O.C.	—	—	—	
	12:45	.4	001	21.0	62.5'	Ambient air 5' from hole	—	—	—	Before setting
	2:30	.3	001	21.0	62.5	In casing & in annulus	—	—	—	After setting casing
	4:30	.3	001	21.0	62.5'	In 8" casing	—	—	—	Before welding
	4:35P	.3	001	21.0	62.5	Ambient air @ Table	—	—	—	"
1-2-88	9:00A	Background 0.0	-002	21.1	62.5	Under table apron	—	—	—	Before Rig.
	~9:30A	—	—	—	62.5 casing @ 52'	—	15 @ 10°C	6.14 @ 10.6°C	3-4gpm	Some water [illegible] coming from [illegible]
	10:30A	—	-002	21.0	69'	Under apron	22 @ 8.8°C	5.25 @ 10.3°C	3-4gpm	
	12:15P	0.0	—	—	69'	"			10 gpm	12:00 [illegible] casing @ [illegible]
	12:50P	—	-001	21.0	69'	In casing	—	—		
	12:50P	—	-002	21.0	69'	3' From hole	—	—	—	Casing @ [illegible]
	3:50PM	—	-002	21.0	82.5'	Under apron, and on drillers platform	—	—	—	Before [illegible] casing
11-3-88	8:25	—	Before 000 drilling	20.8	82.5	Under apron	35 @ 9.8°C	7.28 @ 9.3°C	—	Casing @ [illegible] Water sit[illegible] in casing [illegible]
	8:45	—	—	—	82.5'	—	25 @ 10°C	5.82 @ 11.1	3-4	Water from [illegible]
	9:15	—	—	—	102.5'	—	35 @ 9°C	5.72 @ 9.5°C	? 10	Water fr[illegible] hole
	11:30	—	000	20.9	102.5'	Under apron	20 @ 12°C	5.37 @ 12°C	20gpm?	Casing [illegible] yield [illegible] estimate [illegible]
	12:30	Background 0.1 0.1	000	20.9	102.5'	At T.O.C. 8" casing	—	—	—	Rig shut down / [illegible]
	12:32	0.1	000	20.9	102.5'	In workspace 2' from table	—	—	—	"

AR303692

See Page 2

Delta RI/FS Page 2 Nov. 3, 1988

18-88 Data collected by R. Pollok

Date	Time	Hnu	%LEL	% OX	Loc. of Measurement	Hole Depth	Sp. Cond. µmhos	pH	Blown Yield	Comme
11-3-88	2:00	—	000	20.9	Inside 8" casing	102.5'	—	—	—	Before Se
"	2:02PM	—	000	20.9	Under Apron	102.5'	—	—	—	Cas. To
"	2:55	—	000	20.9	Workspace @ Table	102.5'	—	—	—	
"	3:50	—	—	—	—	102.5'	28 µmhos @ 11°C	6.12 @ 12.1°C	> 20? Too much sand to measure yield	Set 95'
"	4:30	0.0	—	—	—	102.5'	12 µmhos @ 10°C	5.71 @ 9.7°C	20 gpm	As @ 95
11-4-88	8:45	0.2	000	20.8	Under Apron	102.5'	28 µmhos @ 10.5°C	6.04 @ 9.1°C	100-200 gpm	Water Sample
	"	0.2	000	20.8	Workspace at Table	102.5'	Casing @ 99'	—		Take N9:
	11:30	0.0	001	20.7	Under Apron	102.5'	—	—	—	Before Weld
	11:30	0.0	000	20.7	Workspace at Table	102.5'	—	—	—	+ Cutting
	12:45	—	—	—	—	102.5'	23 @ µmhos 13.5	6.07 @ 10.8°C	20	Casing Set @
	2:00	0.0	001	20.8	Under Apron	102.5'	—	—	—	Befo
	2:00	Background 0.0 0.0	000	20.8	Workspace @ Rig Table	102.5'	—	—	—	Setting
11-7-88	9:00	0.3	—	—	Workspace @ Table	102.5'	—	—	—	20's on 3
	12:00	—	000	21.0	Rig on Workspace @ Table	102.5'	Casing still @ 99.8 GL	—	—	After Retrieve Stain
11-8-88	9:00 AM	Background 0.2 0.2	000	21.0	Rig off @ Table	102.5'	—	—	—	Before Start
	9:30	0.3	000	21.0	Rig on Blowing @ 80	102.5'	35 µmhos @ 8.5°C	6.52 @ 8.0°C		Water Casing
	9:35	.3	000	21.0	Rig on Not Blowing @ Table	102.5'	12 µmhos @ 8.8°C	6.12 @ 8.5°C	10-20	Water After 5 3 min
	1:30	0.2	000	20.9	Rig off @ Table	102.5'	—		—	Before Try Fluid As Pull Stain
	3:15	Background 0.2 0.3	000	20.9	Rig on @ Table	102.5'				
	3:15	0.2	000	20.9	Background					
	3:30	0.2	001	20.9	In 8" Casing 2"					Bef Well

AR303693

DELTA RI/FS
18-88

Oct. 31, 1988
Nov. 1, 2, 3 1988

WELL CONSTRUCTION DETAILS

1. 8" Hole with Roller Bit 0-20'
2. Ream to 10" " " 0-20'
10-31-88 3. Set 20' of 8" Heavy Wall Steel Casing @ 19' B.G.L.
11-1-88 4. 8" Hole with Hammer 20-41
5. Foam (1 qt. "Airfoam/20 gallons H_2O) Ran Foam 41-50' +40 gal
6. 8" Hole w./Hammer 48-50'
50-62.5'
7. Weld on 21'6" more feet of 8" casing - Set Casing @ 40.5' B.G.L.
8. Weld on 11'9" more (Total Casing Length 53'3") - Set Casing @ ~52' B.G.L.
★ All Water from 41-62.5' was mixed with cuttings and was too
★ thick to Pump so it all was put in cuttings Pit with Loader
11-2-88 9. Drill 8" Hole w/Hammer 62.5-69' stopped 1 hr. to get Fuel for Rig
10. Set 11'3" more of 8" Casing (64'6"? total Length) @ ~63' B.G.L.
11. Drill 8" Hole w/Hammer 69-82.5' B.G.L.
12. Set 15'11" more of 8" Casing (80'5" Total Length) @ 79' B.G.L.
11-3-88 13. Blew Hole, Drilled 8" Hole 82.5-102.5'
14. Welded on (20'1" / 3'11") more of 8" casing (103.5' total Length) Set @ 99.5' B.G.L. could pull fan
11-4-88 15. Blew Hole 100-200 gpm? (Difficult to Estimate Because we can only Blow it a few seconds Before Pit is Full - Can't get a sustained yield. Estimate Maybe even 500 gpm the way water "Berches" from Hole.
16. Plumbed hole to 98' B.G.L., Coarse-Sand to Fine-Gravel (Ridgely) about 4' up inside Casing. Check to See if we could pull cas
17. Set 10'4" of Stainless Steel Screen 2"
90' of " " Pipe 2"
18. Casing Pulled Point, Pulled stainless, 20' Length of Stainless Fell in Well

DELTA RI/FS
18-88

WELL CONSTRUCTION DETAILS, CONTINUED

19. FISHED OUT STAINLESS BUT LEFT A 1/4" x 12" piece
11-7-88 Chrome Bared Steel (Hook) in Hole

11-8-88 12. BLEW Hole with 8" Rollen Bit to 100' Pulled S

13. Set 8" Stainless Steel CASING AND SCREEN THEN PULLED it OUT

14. Pulled Rig OFF Hole - ATTACHED Locking CAP

SUMMARY: DRILLED DEPTH 8" Hole - 102.5'
Total CASING Length - 102 ' ?
CASING SET AT - 100.5' B.G.L.
SAND FLOWED UP INTO CASING to - 91' B.G.L.
CASING ABOVE GROUND Level -
STATIC H_2O Level 11-9-88 - B

DELTA RI/FS (Projected Formation Shriver) Nov. 9, 1988

21-88

Projected Depth 100'

Logged and Sampled by R. Pollok

Surface 1150

OPEN ROCK HOLE

Moisture Conditions, Blow Yield	Depth	Graphic Log	Lithologic Description	Drill Condit. Rel. Hr.
DAMP to Very DAMP	0		Weathered Light Brown to Gray-Brown Siltstone 0-36' — Return Diminished Because of Moisture	SOF
	10		Weathered Light Brown to gray Brown Siltstone	Me SOF 20 2'/m
			[Formation: Shriver 0-110']	
	20			
DAMP to MOIST	23			
	24			
DAMP to Very Damp				
	30			21
DAMP to MOIST			} Sample very moist - Balled-up	2'/m
DAMP	35			
	36		Lt. Brown to Slightly Orange Brown weathered Siltstone	Me 400psi 2'/min
1100	40		LIGHT BROWN TO SILTLY ORANGE-BROWN WEATHERED SILTSTONE 36-47' ← 40', 10" stopper to set [illegible] 6" PVC	
	47		DARK GRAY NON-CALCAREOUS SILICEOUS SILTSTONE	
	50		DARK GRAY NON-CALCAREOUS SILICEOUS SILTSTONE 47-51	

AR303696

DELTA RI/FS

21-88

Nov. 1988

Logged and Sampled by R. Pollok

TURE ...ITIONS, ...WN YIELD	DEPTH	GRAPHIC LOG	LITHOLOGIC DESCRIPTION		DRILLING CONDITIONS REL. HARDNESS
	50		DARK GRAY NON CALCAREOUS SILICEOUS SILTSTONE		MEDIUM
			DAR... NON-...		
MOIST to WET				56	SOF
				57.5	MED.
NEAR DRY CUTTING	60			59	HARD
61 ROD CLG.			DARK GRAY-BROWN TO DARK GRAY	62	MED.
			SILICEOUS SILTSTONE, NON-CALCAREOUS.		
DAMP to MOIST	67			67	SOFT
Cuttings Proveed	68				
	70				
to moist to WET				72?	MED.
				77	MED. SO
MOIST DAMP	80				
ROD CLG. 81			← A LITTLE MUD @ ROD change		
			← BLACK SILTY SHALE HORIZON @ 85'	85	Soft
	90		DARK GRAY & NON-CALCAREOUS SILTSTONE		
	100				

AR303697

DELTA RI/FS

21-88

Nov. 10, 1988

Logged and Sampled by

Time Conditions, Blown Yield	Depth	Graphic Log	Lithologic Description	Drill Condit. Hardness
	100			
DAMP No Blown water or mud but return is reduced			DA[illegible]	101 — Medi[illegible] Even Drill
			Si[illegible]	
	110			110
8 gpm After Developing			T.D. 110'	

Let Sit ½ Hour After Drilling

Final Blown Yield – 8 gpm

Final pH – 7.29 @ 13.6°C

Final Conductivity – 49 μmhos @ 13.9°C

~6 Photos Taken of Progress

AR303698

DELTA RI/FS

Begun Nov. 9, 1988

21 - 88

WELL DATA

DATE	TIME	DEPTH DRILLED	LOCATION OF AIR MEASURER	Hnu	% OX.	% LEL	BLOWN YIELD	SPECIFIC COND. µmhos	pH	COMMENTS
11-9-88	12:00	0	Background	0.1	Charging Problem on LEL		—	—	—	
	12:30	21'	@ Table	0.1	—	—	—	—	—	
	12:45	41'	@ Table	0.1	—	—	—	—	—	
			in Hole	0.1						
	1:50	41'	Background	0.0	—	—	—	—	—	
			in Hole	0.0						
	2:10	41'	Background	0.1	—	—	—	—	—	Rig Running + Blowing + Reaming @
			@ TABLE	0.1						
	2:15	41'	SMOKE UNDER TABLE	0.3	Charging Problem on LEL		—	—	—	Compressor oil Smoke visible and odor
	3:00	41'	UNDER TABLE	0.3	—	—	—	—	—	Rig Running Blowing Reaming 10" @ 38'
	~3:30	41'	BACKGROUND	0.4	—	—	—	—	—	RIG OFF, CASING SET in Hole @ 38'
			UNDER TABLE	0.3						
	3:30	41'	8" in Annulus Between 6" PVC and 10" Hole	.3	—	—				RIG OFF, 6" PVC set @ B.GL
	3:35	41'	1' From Hole	.4	—	—	—	—	—	BEFORE GROUTING HOLE
	3:36	41'	1' From Hole	1.0	—	—	—	—	—	While Grouting (Sm[illegible] Reading Prob. Grouter Exh[illegible])
	3:37	41'	Between Rig and Grouter	2.0 to 3.0	—	—	—	—	—	GROUTER MOTOR ON Smelled EXHAUST FUMES
11-10-88	9:00	41'	Background 30' From Rig	0.4	—	—	—	—	—	CASING SET @ 38' Rig ON NOT BLOWING
	9:00	41'	AT TABLE	0.4	—	—	—	—	—	Rig on "
	10:00	41'	AT Hole	0.4	—	—	—	—	—	Rig on "
	10:00	41'	—	—	—	—	? <1gpm	219 @ 9.5°C (Cement H_2O?)	7.16 @ 9.3°C	WATER BLOWN FROM INSIDE CASING
	10:15	61'	@ TABLE	0.3	—	—	—	—	—	Rig on, Blowing
	10:45	110'	@ TABLE	0.3	—	—	—			RIG ON, NOT BLOWING
			in Hole	0.3						
	11:40	110'	@ TABLE	0.3	—	—	5gpm	39 @ 14.8°C	7.65 @ 15.4°C	AFTER SITTING ½ HO[illegible] RIG OFF (WATER 1ST BLOWN)
			in Hole	0.3						
	12:00	110'	@ TABLE	0.4	—	—	8gpm	49 @ 13.9°C	7.29 @ 13.6	WATER AFTER BLOWING Rig-on Blowing
			UNDER APRON	0.4						
	2:00P	110'	IN Hole	—	21.0	000	—	—	—	AFTER PULLING RIG OFF Hole

AR303699

DELTA RI/FS

21-88

WELL CONSTRUCTION DETAILS

1. 6" Hole with Hammer 0 - 40' 10"
2. 10" Hole with Roller Bit 0 - 38'
3. Set 39' of 6" Sched. 40 PVC Threaded flush-joint in 4-10' Lengths (make threads down), Bottom threads cut off, Set @ 38' B.G.L.
4. Bentonite 38 - 35' in 6" x 10" annulus (3/8" Pellets)
5. Grout 35' - 3'

   Grout Mix: 9 Bags Portland cement (846 lb.)

   28 lbs of Granular Bentonite

   4:00 PM TO

   Set 18 hours ~45 gallons of water
6. Had Fuel Spill ½ gal. under rig - Put Granular Bentonite on Fuel and dug 1' of Soil off top and put it in Cuttings Pit Check with HNU afterwards and got ~1 ppm @ 2" from Soil
7. 6" Hole 41 - 110'
8. Let Sit ½ Hour
9. Blew Hole + Developed ½ Hour Final Blown Yield 8 gpm

10. 2nd Fuel Spill ~½ gallon of Gas from Green truck leaked from Tank 40' N. of Well - Skid Loader Excavated 1' of Soil from area + Placed it in Cuttings Pit - Sniffed with HNU < 1 ppm after Excavation

11. Sakrete 3' - 0', 6' Length of 8" Protective Casing set @ 3' B.G.L. with Locking Cap

AR303700

DELTA RI/FS

NOV. 14, 1988

WATER LEVELS

Well Number	Water Level Depth Below T.O.C. (8")(6")	Height of Casing (6" or 8") A.G.L.	Time	COMMENTS
14-88	79.27 (8")	3.43	1:00	
15-88	78.32 (6")	3.10	1:06	
16-88	23.08 (6")	2.45	1:15	
Long Pipe ~~17-88~~ 509	13.59 (4" PVC)	.40	1:30	
18-88	16.62 (8")	1.45	1:25	SP. COND. too Low Probe not activate watches it touch H. SURFACE + added 2

AR303701

Delta RI/FS

Water Levels

Measured by R. Pollok

D-

Date	Time	Well Number	Water Level Below T.O.C.	Drilled Depth	Comments
11-21-88	12:05 PM	13-88	146.58'	198'?	Hole plumbed w/soiltest to AT 182
"	4:30P	15A-88 1135	82.39'	130'	5' lower than Fri, ★ sound of drops below water trickling in
"	4:32P	15-88	78.35'	77'	2" of H_2O in Steel Cup on Bott.
—	—	—	—	—	Bottom of Screen ~ 75' 2" (ie 1'6" stick-up of 2" stainless A.G.L) 76'8 total

AR303702

GEOPHYSICAL LOGS

P.O. Box 17203
Pittsburgh, PA 15235
Telephone (412) 243-3039

APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
11-88

COMPANY CANONIE ENVIRONMENTAL	LOCATION	UNIT 53 OFFICE Pgh
PROJECT HOLE NO. 11-88		OPERATOR PRC
CLIENT REPRESENTATIVE A. Pryon	COUNTY Blair STATE PA	DATE 18-Aug-89
DRILLED DEPTH 90 FT. ELEVATION FT.	CASING DEPTH FT.	DRILLING FLUID AIR
HOLE DIAMETER 6.0 IN. WATER LEVEL 57 FT.	DIAMETER IN. FACTOR 28	DRILLING CO. DRILLER
	WALL THICKNESS IN.	

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
1	CALIPER	28 - 77	1 in/in			
2	NATURAL γ	6 - 77	100 CPS	2 SEC	NATURAL	
2	H.R. DENSITY	6 - 77	1k CPS	1 SEC	Am 241	0.5 in.
	γγ DENSITY	-	CPS	SEC	Ra 226	in.
4	NEUTRON	6 - 77	1k CPS	1 SEC	Am-Be	12.0 in.
3	RESISTIVITY	57 - 77	50 Ω			
	SPONTANEOUS POTENTIAL	-	MV			
	TEMPERATURE	-	°F			
	FLUID CONDUCTIVITY	-	ΩM			
	SONIC	-	us/ft			2.0 FT.
	OTHER	-				

INTERPRETATION

- COAL < 10% ASH
- COAL > 10% ASH
- BONE/CARBONACEOUS SHALE > 50% ASH
- FIRECLAY/HOT SHALE
- LIMESTONE/OTHER CARBONATE
- SANDSTONE
- SILTY SANDSTONE
- SHALE/CLAYSTONE
- SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

RUN #	INTERVAL (DEPTH) FT.	SCALE FT/IN	LOGGING SPEED FT/MIN
1	SUR - 77	10	50
2	SUR - 77	10	20
3	SUR - 77	10	20
4	SUR - 77	10	20
	-		
	-		
	-		
	-		

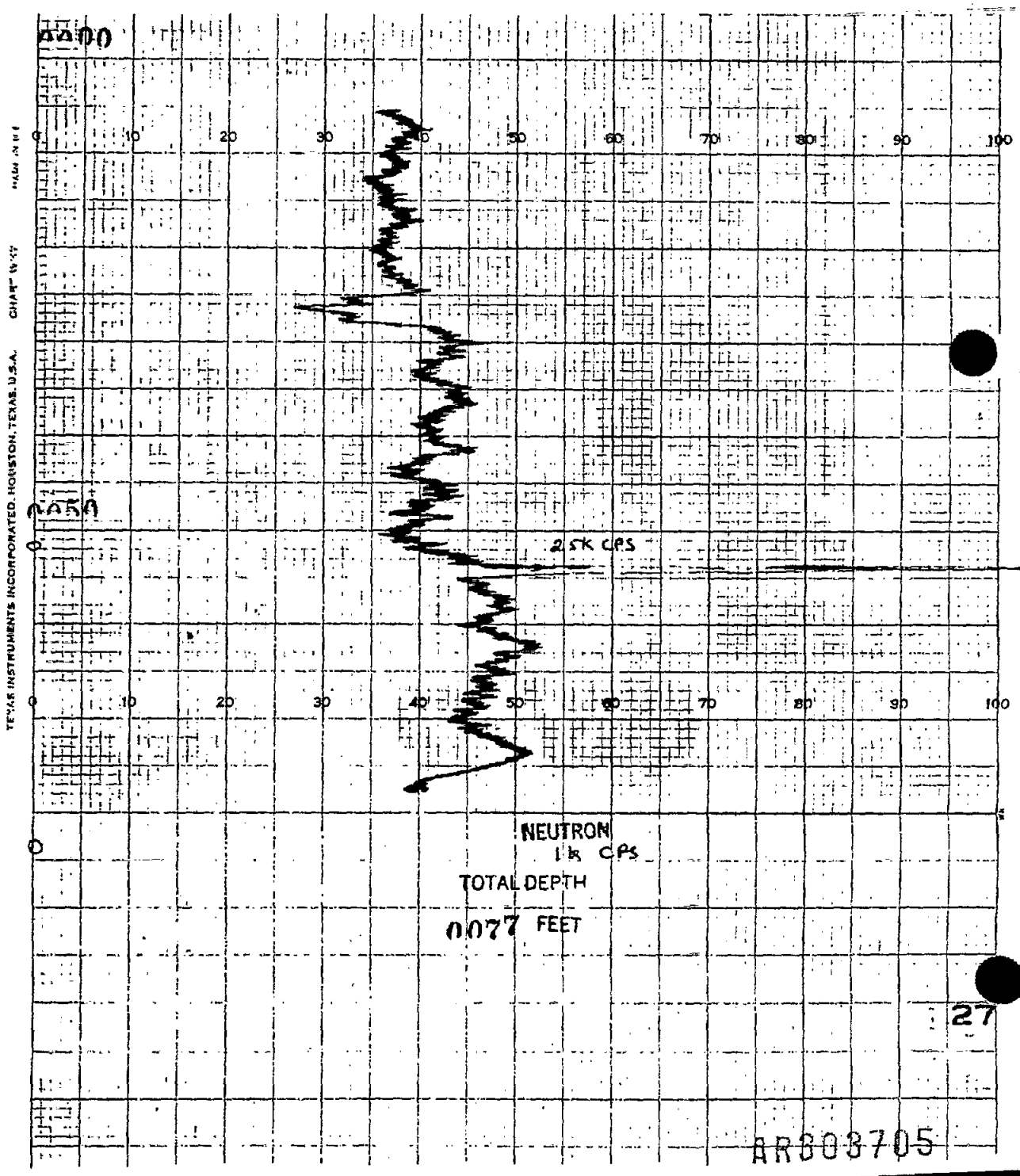
NOTES:

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ

H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3

D-

AR303704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30
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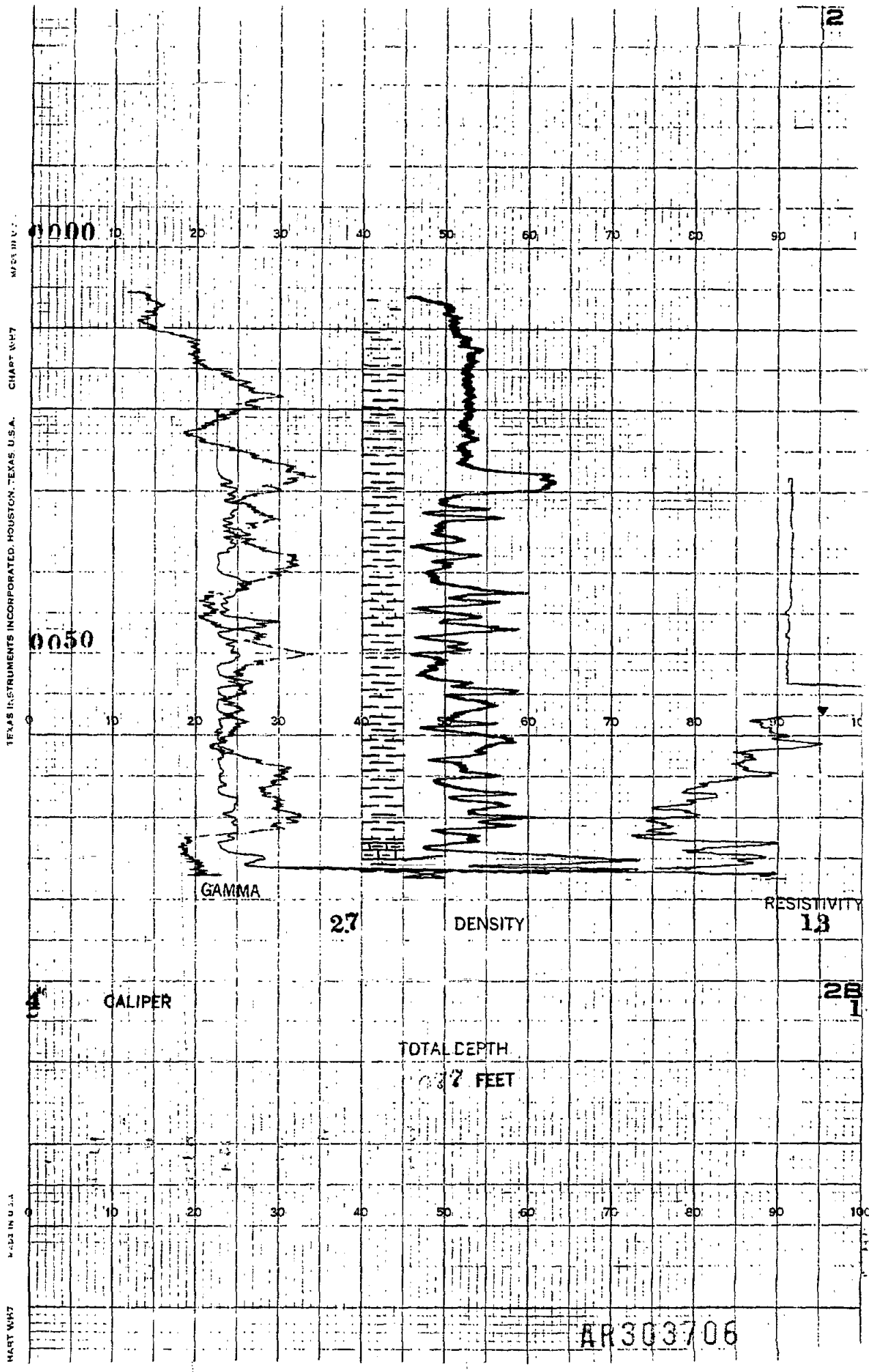
70
80
90
100
2050
2.5K CPS
NEUTRON
1k CPS
TOTAL DEPTH
0077 FEET
TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.

27

AR303705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GAMMA
2.7
DENSITY
RESISTIVITY
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4"
CALIPER
2B
1
TOTAL DEPTH
FEET
TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.
CHART W47
HART W47
AR303706

P.O. Box 17203
Pittsburgh, PA 15235
Telephone (412) 243-3039

APPALACHIAN COAL SURVEYS

LOG LOADING
HOLE NO.
13-88

COMPANY CANONIE ENVIRONMENTAL	LOCATION	UNIT 53 OFFICE Pgh
PROJECT HOLE NO. 13-88		OPERATOR PRC
CLIENT REPRESENTATIVE A. Pryon	COUNTY Blair STATE PA	DATE 18-Aug-89
DRILLED DEPTH 190 FT. ELEVATION FT.	CASING DEPTH FT.	DRILLING FLUID AIR
HOLE DIAMETER 6.0 IN. WATER LEVEL 123 FT.	DIAMETER IN. FACTOR 41	DRILLING CO. DRILLER
	WALL THICKNESS IN.	

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
1	CALIPER	41 - 170	1 in/in			
2	NATURAL γ	6 - 170	100 CPS	2 SEC	NATURAL	
2	H.R. DENSITY	6 - 170	1k CPS	1 SEC	Am 241	0.5 in.
	γγ DENSITY	-	CPS	SEC	Ra 226	in.
4	NEUTRON	6 - 170	1k CPS	1 SEC	Am-Be	12.0 in.
3	RESISTIVITY	123 - 170	50 Ω			
	SPONTANEOUS POTENTIAL	-	MV			
	TEMPERATURE	-	°F			
	FLUID CONDUCTIVITY	-	ΩM			
	SONIC	-	us/ft			2.0 FT.
	OTHER	-				

INTERPRETATION

- COAL < 10% ASH
- COAL > 10% ASH
- BONE/CARBONACEOUS SHALE > 50% ASH
- FIRECLAY/HOT SHALE
- LIMESTONE/OTHER CARBONATE
- SANDSTONE
- SILTY SANDSTONE
- SHALE/CLAYSTONE
- SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

RUN #	INTERVAL (DEPTH) FT.	SCALE FT./IN	LOGGING SPEED FT./MIN
1	SUR - 170	10	50
2	SUR - 170	10	20
3	SUR - 170	10	20
4	SUR - 170	10	20
	-		
	-		
	-		
	-		

NOTES:

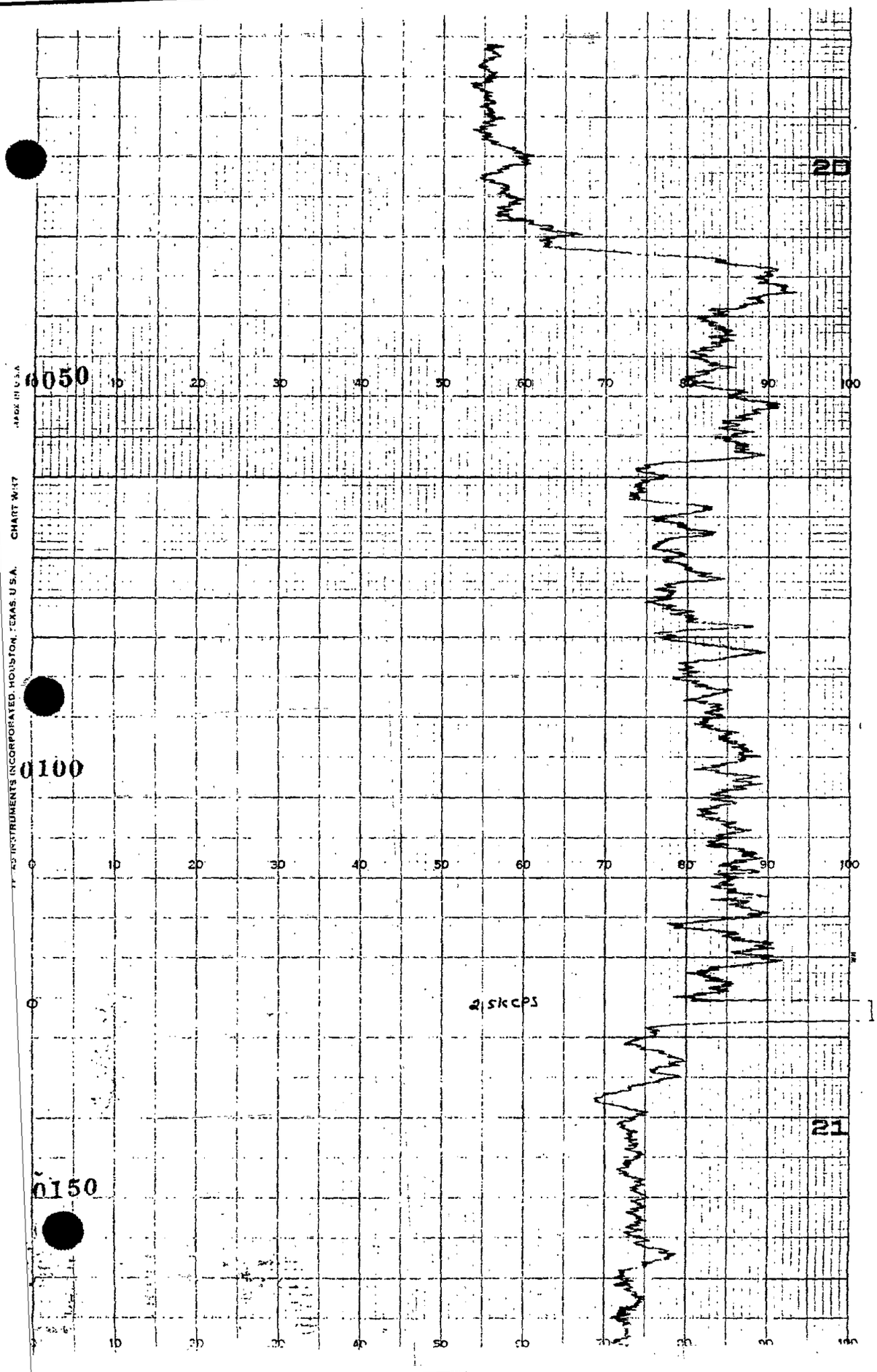
0 10 20 30 40 50 60 70 80 90 100

H.R. DENSITY CALIBRATION g/cc

27 26 25 24 23 22 21 20 19 18 17 16 15 14 13

AR303707

D-



20
0050
10
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30
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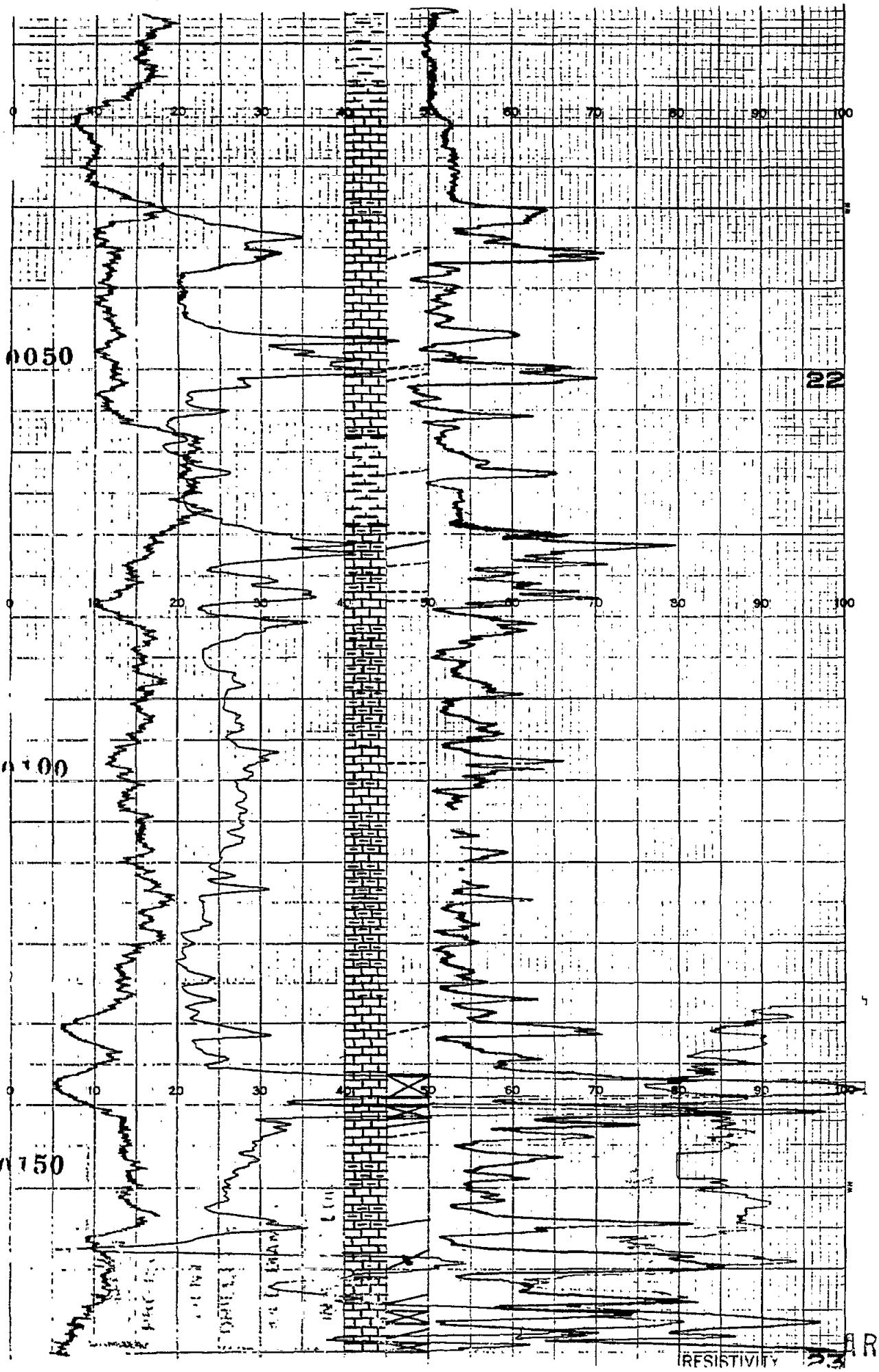
AR303708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0100
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22
23
RESISTIVITY

P.O. Box 203
Pittsburgh, PA 15235
Telephone (412) 243-3039

APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
15A-88

COMPANY CANONIE ENVIRONMENTAL	LOCATION	UNIT 53 OFFICE Pgh
PROJECT HOLE NO. 15A-88		OPERATOR PRC
CLIENT REPRESENTATIVE A. Pryon	COUNTY Blair STATE PA	DATE 18-Aug-89
DRILLED DEPTH 130 FT. ELEVATION FT.	CASING DEPTH FT.	DRILLING FLUID AIR
HOLE DIAMETER 6.0 IN. WATER LEVEL 56 FT.	DIAMETER IN. FACTOR 41	DRILLING CO. DRILLER
	WALL THICKNESS IN.	

RUN	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
1	CALIPER	41 - 127	1 in/in			
2	NATURAL γ	6 - 127	100 CPS	2 SEC	NATURAL	
2	H.R. DENSITY	6 - 127	1k CPS	1 SEC	Am 241	0.5 in.
	γγ DENSITY	-	CPS	SEC	Ra 226	in.
4	NEUTRON	6 - 127	1k CPS	1 SEC	Am-Be	12.0 in.
3	RESISTIVITY	56 - 127	50 Ω			
	SPONTANEOUS POTENTIAL	-	MV			
	TEMPERATURE	-	°F			
	FLUID CONDUCTIVITY	-	ΩM			
	SONIC	-	us/ft			2.0 FT.
	OTHER	-				

NOTES:

INTERPRETATION

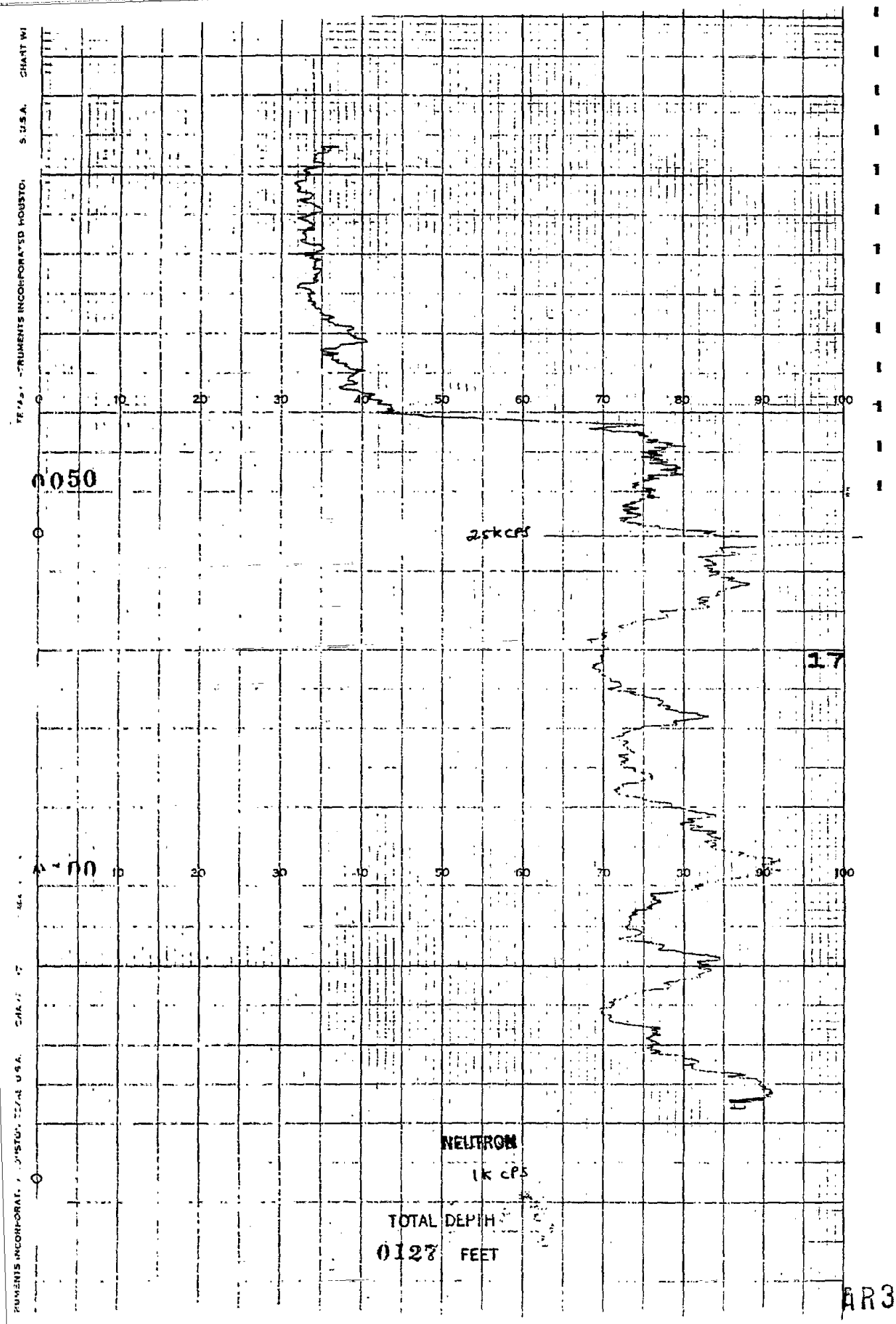
- COAL < 10% ASH
- COAL > 10% ASH
- BONE/CARBONACEOUS SHALE > 50% ASH
- FIRECLAY/HOT SHALE
- LIMESTONE/OTHER CARBONATE
- SANDSTONE
- SILTY SANDSTONE
- SHALE/CLAYSTONE
- SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

RUNS

RUN #	INTERVAL (DEPTH) FT.	SCALE FT./IN.	LOGGING SPEED FT./MIN.
1	SUR - 127	10	50
2	SUR - 127	10	20
3	SUR - 127	10	20
4	SUR - 127	10	20
	-		
	-		
	-		
	-		

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ

27 26 25 24 23 22 21 20
H.R. DENSITY CALIBRATION g/cc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40
50
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0050
25kcps
17
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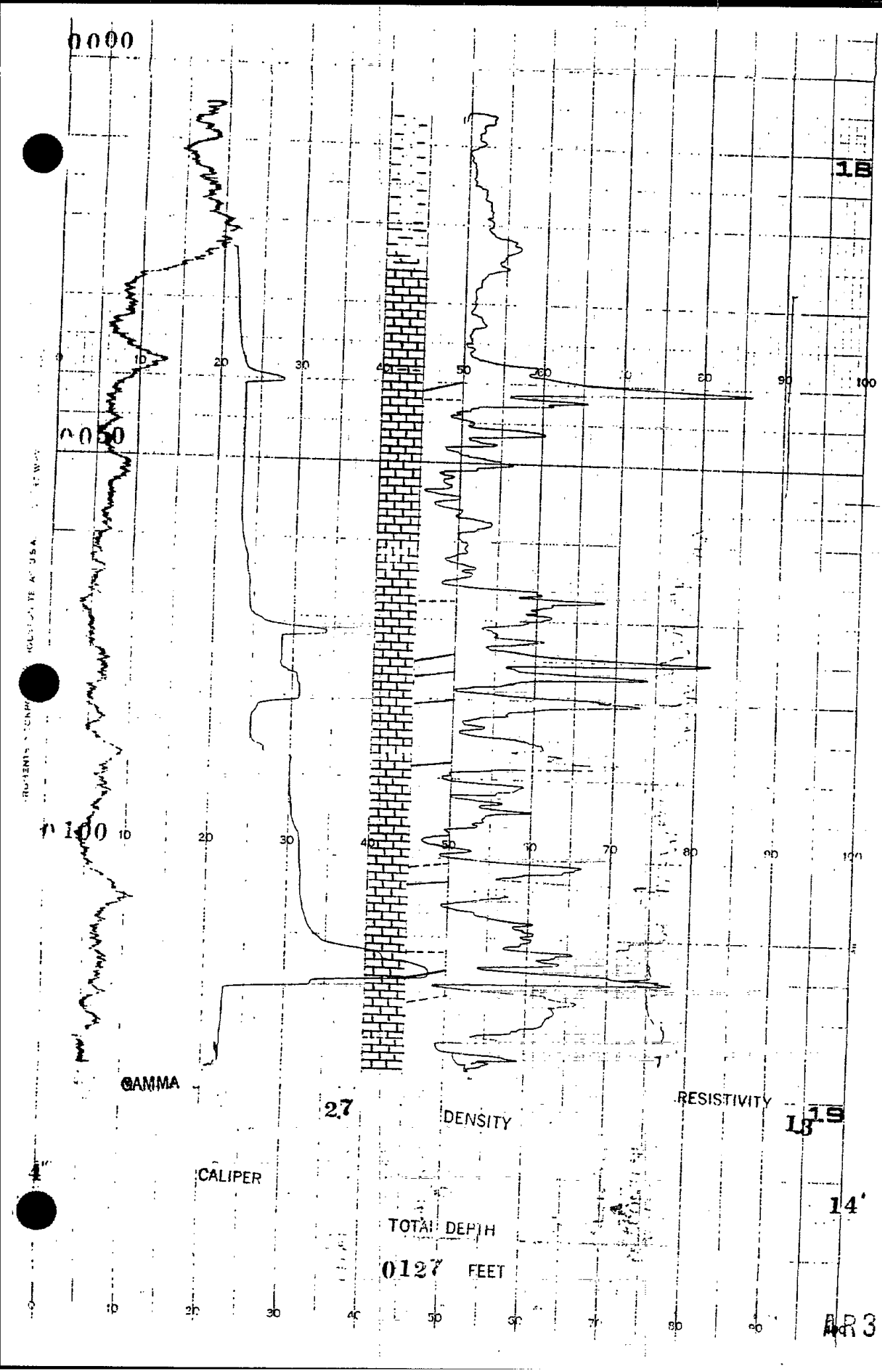
NEUTRON
1k cps
TOTAL DEPTH
0127 FEET

AR303711


0000
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0100
18
GAMMA
27
DENSITY
RESISTIVITY
13
19
4"
CALIPER
14'
TOTAL DEPTH
0127 FEET

AR303712

P.O. Box 17203
Pittsburgh, PA 15235
Telephone (412) 243-3039

APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
19-88

COMPANY CANONIE ENVIRONMENTAL	LOCATION	UNIT 53 OFFICE Pgh
PROJECT HOLE NO. 19-88		OPERATOR PRC
CLIENT REPRESENTATIVE A. Pryon	COUNTY Blair STATE PA	DATE 21-Aug-89
DRILLED DEPTH 155 FT. ELEVATION FT.	CASING DEPTH FT.	DRILLING FLUID AIR
HOLE DIAMETER 6.0 IN. WATER LEVEL 75 FT.	DIAMETER IN. FACTOR 24	DRILLING CO. DRILLER
	WALL THICKNESS IN.	

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
1	CALIPER	24 - 155	1 in/in			
2	NATURAL γ	6 - 155	100 CPS	2 SEC	NATURAL	
2	H.R. DENSITY	6 - 155	1k CPS	1 SEC	Am 241	0.5 in.
	γγ DENSITY	-	CPS	SEC	Ra 226	in.
4	NEUTRON	6 - 155	1k CPS	1 SEC	Am-Be	12.0 in.
3	RESISTIVITY	75 - 155	50 Ω			
	SPONTANEOUS POTENTIAL	-	MV			
	TEMPERATURE	-	°F			
	FLUID CONDUCTIVITY	-	ΩM			
	SONIC	-	us/ft			2.0 FT.
	OTHER	-				

INTERPRETATION

- COAL < 10% ASH
- COAL > 10% ASH
- BONE/CARBONACEOUS SHALE > 50% ASH
- FIRECLAY/HOT SHALE
- LIMESTONE/OTHER CARBONATE
- SANDSTONE
- SILTY SANDSTONE
- SHALE/CLAYSTONE
- SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

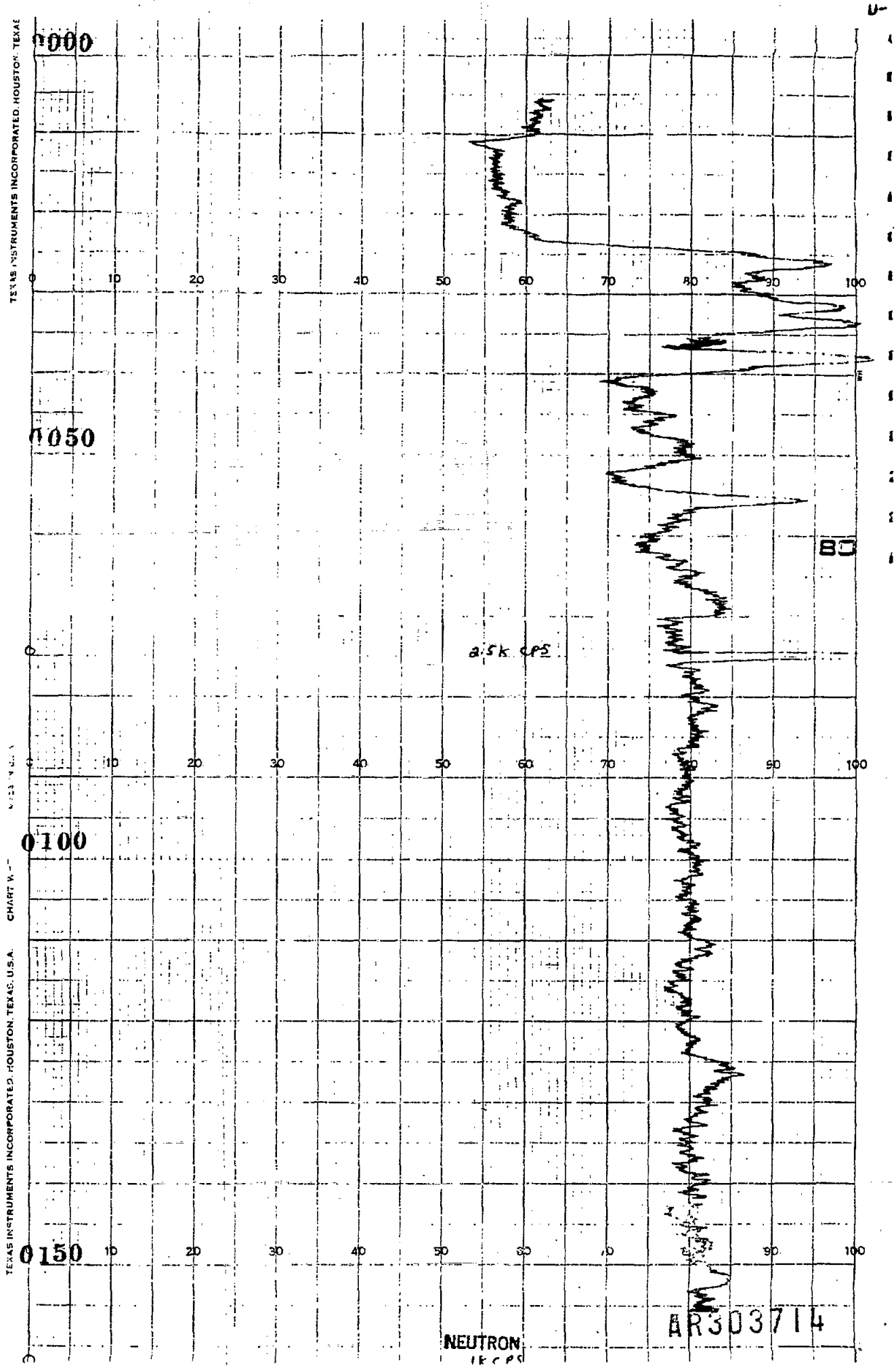
RUN #	INTERVAL (DEPTH) FT.	SCALE FT./IN.	LOGGING SPEED FT./MIN.
1	SUR - 155	10	50
2	SUR - 155	10	20
3	SUR - 155	10	20
4	SUR - 155	10	20
	-		
	-		
	-		
	-		

NOTES:

0 10 20 30 40 50 60 70 80 90 100

H.R. DENSITY CALIBRATION g/cc

AR303713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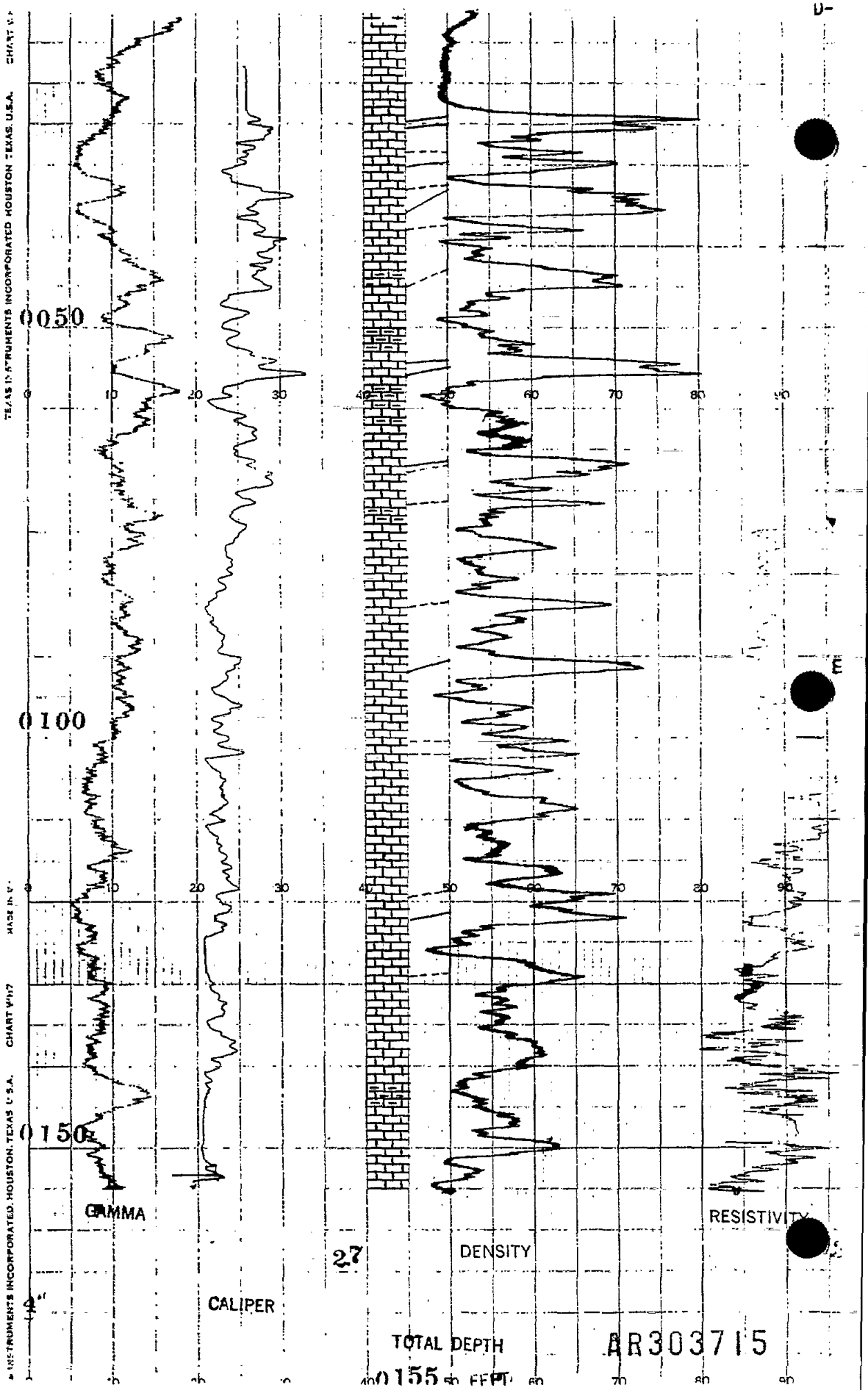
AR303714


TEXAS INSTRUMENTS INCORPORATED HOUSTON TEXAS U.S.A.
0050
0100
0150
GAMMA
CALIPER
DENSITY
RESISTIVITY
TOTAL DEPTH
0155 FEET
27
AR303715

APPENDIX E

APPENDIX E

RESIDENTIAL WELL INVENTORY FORMS

DRAFT

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: James Conner Date: 9/7/88

Address: Street - RD #1 Box 966-C Phone: 943-5480

City - Altoona PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics: well in shallow swale that goes across front of house bricks around well casing

Elevation:

Well Depth: 190' Casing Depth/Diameter:

Depth to consolidated rock:

Driller: Fred Albright Date Drilled:

Pump type: submersible Depth of Intake:

Reported yield (or flow if a spring): No. of persons served: 5

Aquifer: Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.): 5

Treatment (softening, filtration, etc.): softener but never put salt in it in last 2 1/2 years

Well access for water level measurement (sketch well head details at bottom):

Depth to water: 142.57' Date: 9/7/88 Time: 11:27 am

Measuring point AGS (+ or -): +2.3' Use prior to measurement: morning before work

Best time during day for routine W.L. measurement: early afternoon

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample: call first

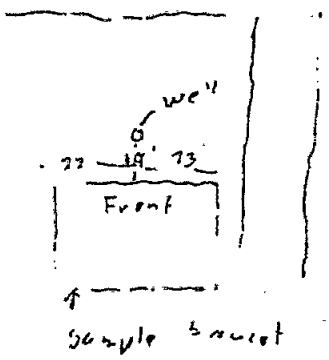


TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: ERRADO + CATHERINE CARRACIOLO Date:

Address: Street - R.D. #1, BOX 924 Phone:

City - ALTOONA, PA 16603

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: Casing Depth/Diameter:

Depth to consolidated rock:

Driller: Date Drilled:

Pump type: Depth of Intake:

Reported yield (or flow if a spring): No. of persons served:

Aquifer: Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.):

Well access for water level measurement (sketch well head details at bottom):

Depth to water: Date: Time:

Measuring point AGS (+ or -): Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:

ASK MIKE LEHMAN

* MEASURE BRIAN JONES' WELL WL AND SURVEY IN! SMELLS AND YELLOW WATER

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: BARBARA BICKLE Date: 7-28-88

Address: Street - RD 1, BOX 921A Phone: (814) 943-1786

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:
USE:

Elevation:

Well Depth: ~75' Casing Depth/Diameter: 6" (B. BICKLE) 6" (B. JONES)

Depth to consolidated rock:

Driller: RITCHEY Date Drilled: APRIL 1984

Pump type: SUBMERSIBLE Depth of Intake:

Reported yield (or flow if a spring): No. of persons served: 1

Aquifer: SHALE? Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): NONE

Well access for water level measurement (sketch well head details at bottom):
UNDER FRONT OF TRAILER - TAKE FROM HOSE BEFORE PRESSURE TANK

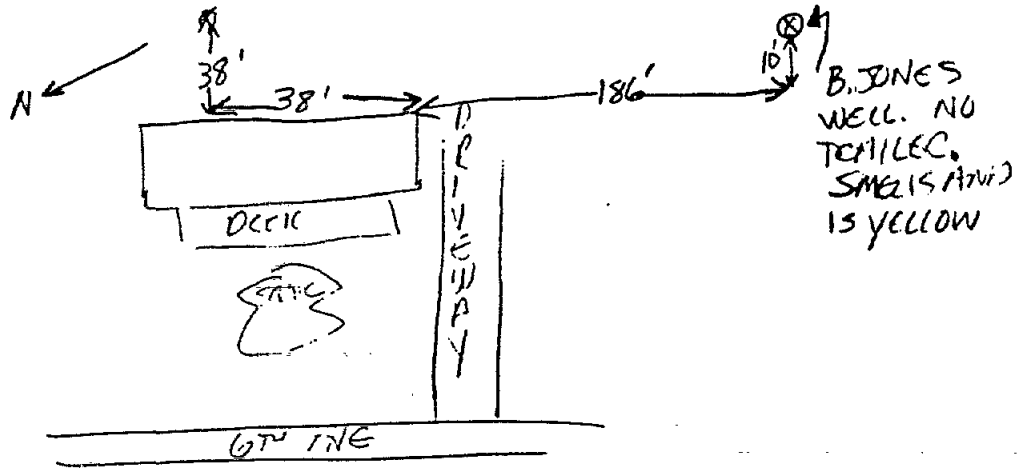
Depth to water: Date: Time:

Measuring point AGS (+ or -): 2.0' Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no) CALL AHEAD

Acceptable time to collect sample:



AR303720

7 28-88 1:45pm

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: PHILIP DRACUP Date:

Address: Street - Phone:

City -

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: Casing Depth/Diameter:

Depth to consolidated rock:

Driller: Date Drilled:

Pump type: Depth of Intake:

Reported yield (or flow if a spring): No. of persons served:

Aquifer: Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.):

Well access for water level measurement (sketch well head details at bottom):

Depth to water: Date: Time:

Measuring point AGS (+ or -): Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: BETTIA M. GEORGE

Date: 7-28-88

Address: Street - R.D. #1, BOX 800

Phone: (814) 944-9540

City - AZTOONA, PA 16603

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 280'

Casing Depth/Diameter:

Depth to consolidated rock:

Driller:

Date Drilled: >33 yrs

Pump type: JET PUMP - 1 PIPE (SHALLOW - CAN'T [illegible] 30' DL).

Depth of Intake:

Reported yield (or flow if a spring): NEVER DRY

No. of persons served: 1

Aquifer:

Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.): USE BOTTLED WATER TO DRINK. COOK + WASH [illegible]

Treatment (softening, filtration, etc.):

Well access for water level measurement (sketch well head details at bottom): [illegible] - TANK - STILL USE OUTSIDE SPIGOT.

Depth to water:

Date:

Time:

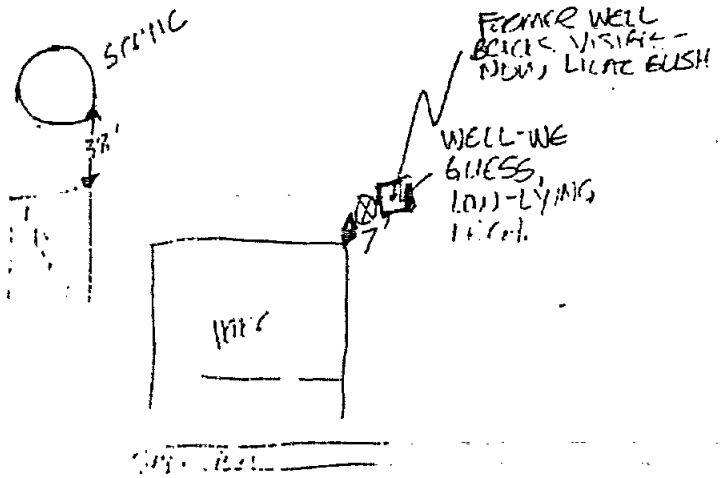
Measuring point AGS (+ or -):

Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:
[illegible] - DON'T DRINK BUT COOK WITH + WASH WITH.



AR303722

7-28-88
1:13 NOT HOME
HOME FROM WORK @ ~4PM

E-7

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: JAMES M. & HELEN HOLLINGSHEAD MOVED HERE IN 1976 Date: 9-6-88

Address: Street - R.D. # 1, BOX 796 Phone: (814) 946-1911

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 141' Casing Depth/Diameter: 6"

Depth to consolidated rock:

Driller: BLATT WOULD KNOW Date Drilled: PREVIOUSLY OWNED BY BLATTS BEFORE 1976

Pump type: SUBMERSIBLE PUT IN 1988 (6/3/88) Depth of Intake:

Reported yield (or flow if a spring): No. of persons served: 3

Aquifer: Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): IRON REMOVAL, TWO PURIFIERS (COLLIGAN)

Well access for water level measurement (sketch well head details at bottom): SAMPLE OUTSIDE SPIGOT AFTER BYPASS TREATMENT

Depth to water: ~40' Date: Time:

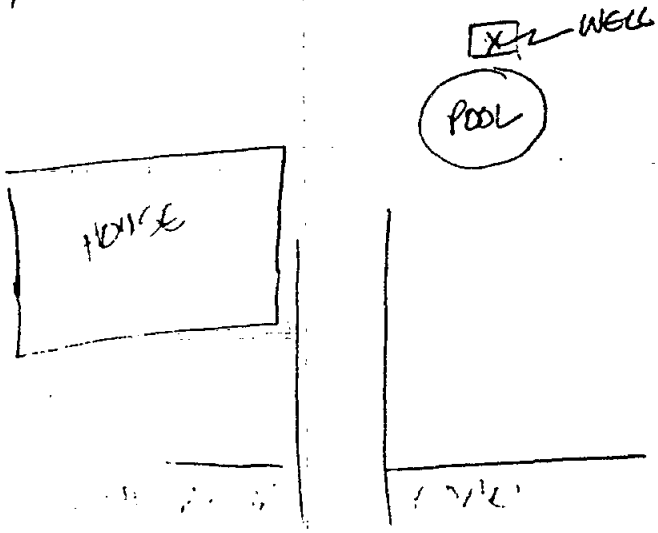
Measuring point AGS (+ or -): Use prior to measurement:
IN WELL HOUSE UNDER ROOF ~ 6' BELOW G. SURFACE

Best time during day for routine W.L. measurement: AFTER 4PM

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample: AFTER 4PM OR ON SATS.

RECENTLY ANALYZED - CLEAN. GARAGE



WISSINGERS WELL & PUMP
5th Ave & 36th ST.
942-2901

CULLIGAN
944-2091

AR303723

JOHN BLATT
944-0226

(106 HOME)

E-8

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: HERBERT JONES Date: 7-28-88

Address: Street - RD 1 BOX 795B Phone: (814) 943-8[illegible]

City -

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 225' Casing Depth/Diameter: ~200' CASING.

Depth to consolidated rock:

Driller: ALBRIGHT Date Drilled: ~1980

Pump type: [illegible] Depth of Intake: ~219

Reported yield (or flow if a spring): No. of persons served: 3 HOMES [illegible] 5

Aquifer: 140' SAND Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): NONE
[illegible] JOHN BLATT BASEMENT

Well access for water level measurement (sketch well head details at bottom):

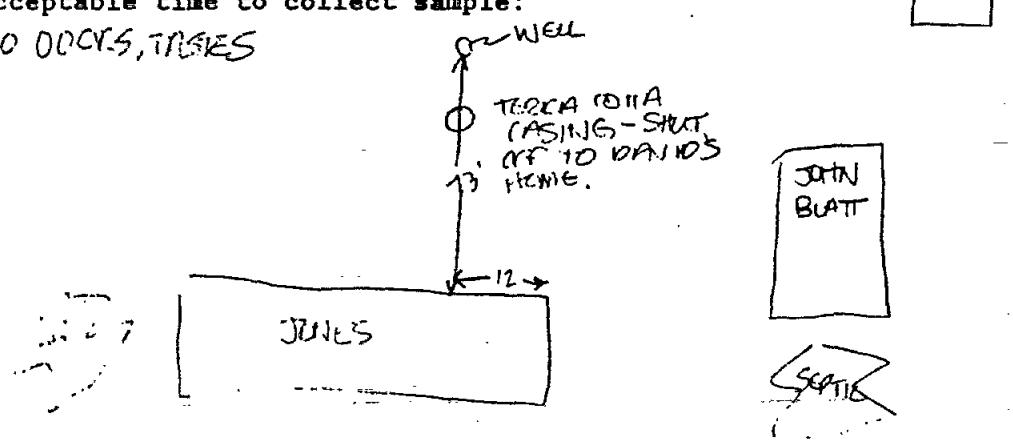
Depth to water: 147' Date: 1-16-86 Time:

Measuring point AGS (+ or -): 1.0 Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:
NO DOORS, TASTES



AR303724

NOTE: NEED INFO ON HOLMES WELL

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM JOSEPH [illegible]

Owner: DEBORAH ~~A. TOMEO~~ AND WILLIAM F. KLING **Date:** 7-28-88

Address: **Street** - R.D. #1, BOX 304 **Phone:** (814) 944-[illegible]

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom): CAN GET SAMPLE IN SHED [illegible]

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 200 (KLING) NOT ACCESSIBLE 135 (HOLMES) CAN MEASURE **Casing Depth/Diameter:** 80' CASING [illegible] WELL COVERED BY PORCH 5" [illegible] DEPTH

Depth to consolidated rock:

Driller: RITCHEY - Maybe RITCHEY DRILLED HOLMES **Date Drilled:** WK OF NOV 25, 1987

Pump type: [illegible] **Depth of Intake:**

Reported yield (or flow if a spring): 6 GPM **No. of persons served:** 6, 2 TRAILERS

Aquifer: [illegible] **Water-Bearing Zones:** 160'

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.):

Well access for water level measurement (sketch well head details at bottom): NO

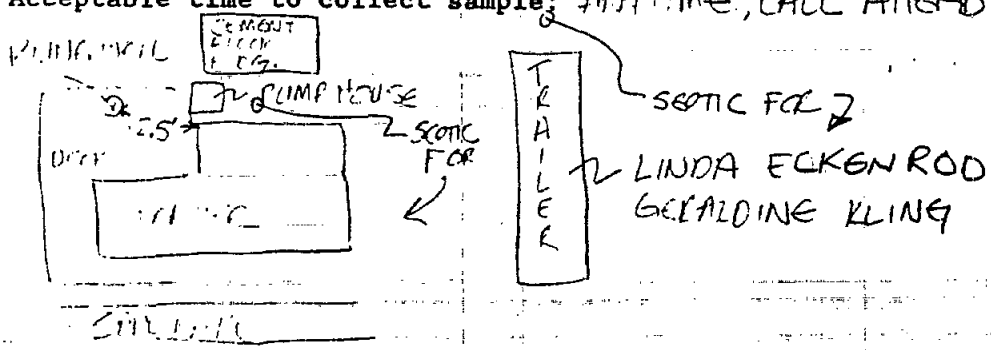
Depth to water: **Date:** **Time:**

Measuring point AGS (+ or -): KLING 1.0 AGS **Use prior to measurement:** CAN'T MEASURE

Best time during day for routine W.L. measurement: ANYTIME TO MEASURE HOLMES [illegible]

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample: [illegible] IN WELL PIT ANYTIME, CALL AHEAD



AR303725

[illegible]
[illegible], PA 16602

OFF WORK

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: JOSEPH E. + CAROLE A. KLING

Date: 7-28-88

Address: Street - RD 1, BOX 804B

City - ALTOONA, PA 16601

Phone: (814) 942-3136
(814) 942-0209
WORK FOR JOSEPH

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 130'

Casing Depth/Diameter: 47' OF 6" STEEL CASING GROUTED FROM 47' TO SURFACE

Depth to consolidated rock:

Driller: MUCH-DRILLING CO, INC
[illegible] RD. 1, 16640

Date Drilled: 10-28-86

Pump type: SUBMERSIBLE

Depth of Intake:

Reported yield (or flow if a spring): NEVER GONE DAY

No. of persons served: 4

Aquifer:

Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): NONE. PRESSURE TANK INSIDE HOUSE [illegible] WASHING, ETC.

Well access for water level measurement (sketch well head details at bottom): [illegible] CASING - CAN ACCESS THOUGH

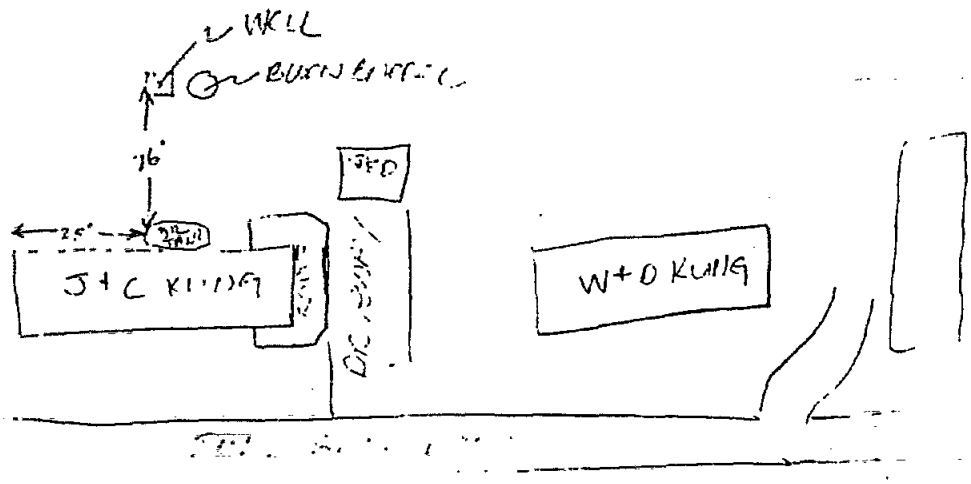
Depth to water: **Date:** **Time:**

Measuring point AGS (+ or -): ~1.5' **Use prior to measurement:**

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample: CALL AHEAD



1.08 5th Ave JUN, Altoona PA

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: THOMAS P. + ROBERTA A. LINGAFELT Date:

Address: Street - Phone:

City -

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: Casing Depth/Diameter:

Depth to consolidated rock:

Driller: Date Drilled:

Pump type: Depth of Intake:

Reported yield (or flow if a spring): No. of persons served:

Aquifer: Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.):

Well access for water level measurement (sketch well head details at bottom):

Depth to water: Date: Time:

Measuring point AGS (+ or -): Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:

... ; go yet?

MAY OR MAY NOT BE HOME IN EVENINGS.

ROBERTA

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: JAMES P LINGAFELT

Date: 7-28-88

Address: Street - R.D 1, BOX 806A

Phone: (814) 943-8433

City - ALTOONA, PA

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 175'

Casing Depth/Diameter:

Depth to consolidated rock:

Driller:

Date Drilled: 1978

Pump type: SUBMERSIBLE

Depth of Intake:

Reported yield (or flow if a spring):

No. of persons served: 4

Aquifer:

Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): LONG BLUE PLASTIC W/PAPER FILTER

Well access for water level measurement (sketch well head details at bottom):

Depth to water:

Date:

Time:

Measuring point AGS (+ or -): N/A

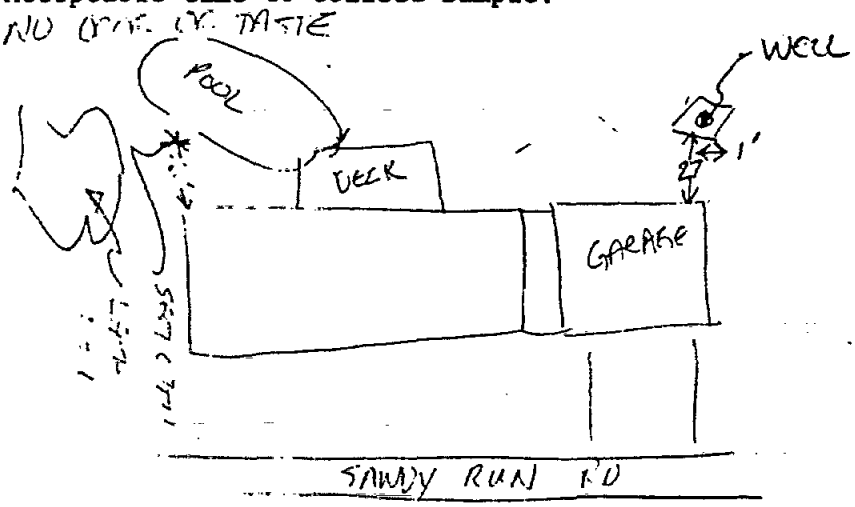
Use prior to measurement:

Best time during day for routine W.L. measurement: AFTER 3:30

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:

NO ODOR OR TASTE



AR303728

CARL BARGER — COMES DOWN IN EVENINGS AND WEEKENDS.
RD1, BOX 924 (Maple)

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: MYRON LEHMAN + JUDY (PFAHLER — MOM) Date: 7-28-88

Address: Street - R.D. #1, BOX 723 Phone: (814) 942-8413

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 58' Casing Depth/Diameter: 260'

Depth to consolidated rock:

Driller: RITCHEY Date Drilled: 1965

Pump type: SUBMERSIBLE Depth of Intake:

Reported yield (or flow if a spring): ~5 GPM No. of persons served: 4

Aquifer: 20' SLATE? Water-Bearing Zones:

Use of supply: (domestic) agricultural, etc.):

Treatment (softening, filtration, etc.): NONE

Well access for water level measurement (sketch well head details at bottom):

Depth to water: Date: Time:

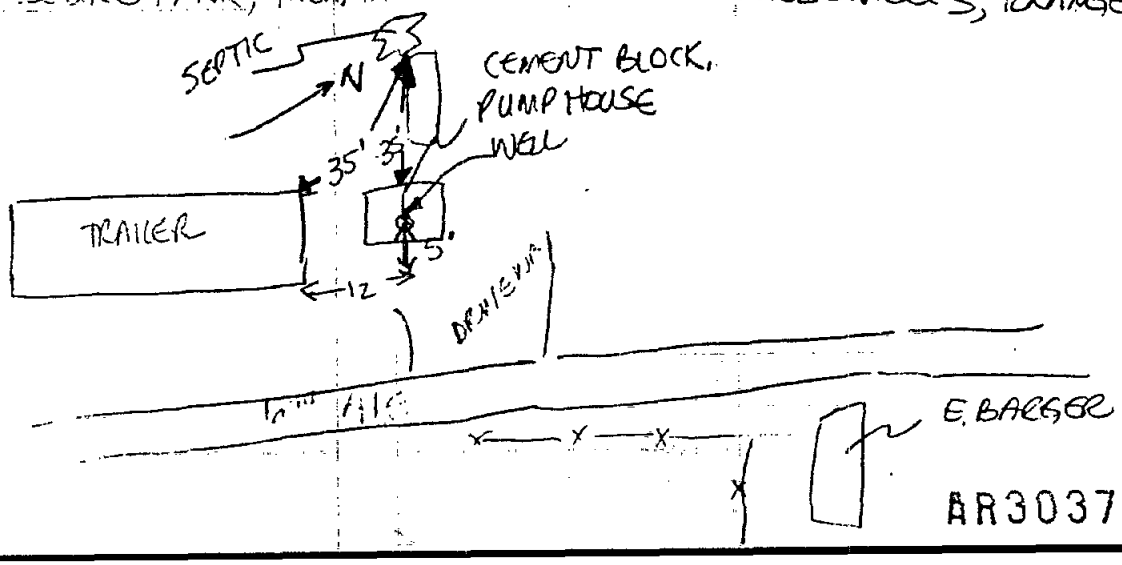
Measuring point AGS (+ or (-)): 3.6 Use prior to measurement:
TO TOP OF BLOCK; BLOCK IS 0.6 AGS

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:

3/0 PRESSURE TANK, IRON IN WATER AND SOMETIMES SMELLS, ORANGE WATER



CASCADE OIL CO. LTD

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: GEORGE ~~NAHL~~ NALE

Date: 7-28-88

Address: Street - R.D. #1, BOX 924B

Phone: (814) 944-2801

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:
IRON (ORANGE) IN WATER

Elevation:

Well Depth: ~55-60'

Casing Depth/Diameter:

Depth to consolidated rock:

Driller: GRAHAM WELL DRILLING (814) 658-3736
[illegible], PA

Date Drilled: 1977?

Pump type: SUBMERSIBLE

Depth of Intake:

Reported yield (or flow if a spring):

No. of persons served: 3

Aquifer:

Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.): DRINK WELL WATER

Treatment (softening, filtration, etc.): NONE

Well access for water level measurement (sketch well head details at bottom):
[illegible] UNDERGROUND. SPIGOT OUT OF HOSE IN HOUSE - RIGHT FROM [illegible]

Depth to water:

Date:

Time:

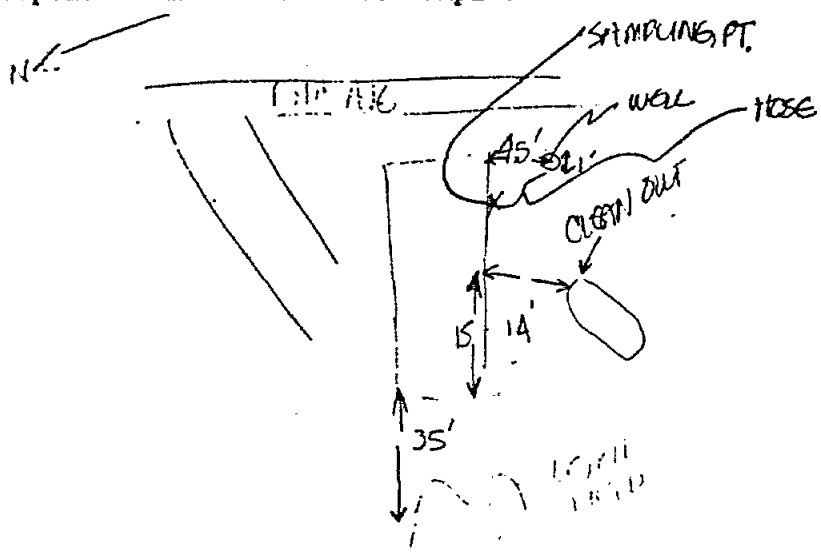
Measuring point AGS (+ or -):

Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:



AR303730

12:00 pm NOT HOME

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: JEFF MARSHALL - RENTS FROM SHAWLEY. Date:

Address: Street - Phone:

City -

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: Casing Depth/Diameter:

Depth to consolidated rock:

Driller: Date Drilled:

Pump type: Depth of Intake:

Reported yield (or flow if a spring): No. of persons served:

Aquifer: Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.):

Well access for water level measurement (sketch well head details at bottom):

Depth to water: Date: Time:

Measuring point AGS (+ or -): Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:

OWNER – SHAWLEY
LIVES IN JUNIATA

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

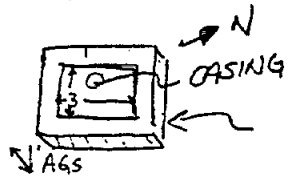
Owner: MORRIS RODKEY (12 YRS LIVED HERE) **Date:**

Address: **Street** - R.D. #1, BOX 799 **Phone:** ~~(814) 944-5712~~ ~~943-4218~~

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:
BIGELOW MIGHT KNOW MORE. DEAN PARSHALL MIGHT HAVE DRILLED



Elevation:

Well Depth:

Casing Depth/Diameter: 6" GALVANIZED CEMENT BLOCK PIT 5.3' FROM TOP OF P TO BOTTOM. CASING IS 0.25 BELOW TOP OF CEMENT BLOCK.

Depth to consolidated rock: DUG WELL? ASK BIGELOW

Driller: **Date Drilled:** ?

Pump type: JET PUMP – 2 PIPES **Depth of Intake:**

Reported yield (or flow if a spring): **No. of persons served:** 2

Aquifer: **Water-Bearing Zones:**

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): NONE

Well access for water level measurement (sketch well head details at bottom): ~~IN BASEMENT~~ BAIL WELL
CAN'T ACCESS BEFORE PRESSURE TANK – HAVE TO BAIL WELL

Depth to water: **Date:** **Time:**

Measuring point AGS (+ or -): 0.75 **Use prior to measurement:**

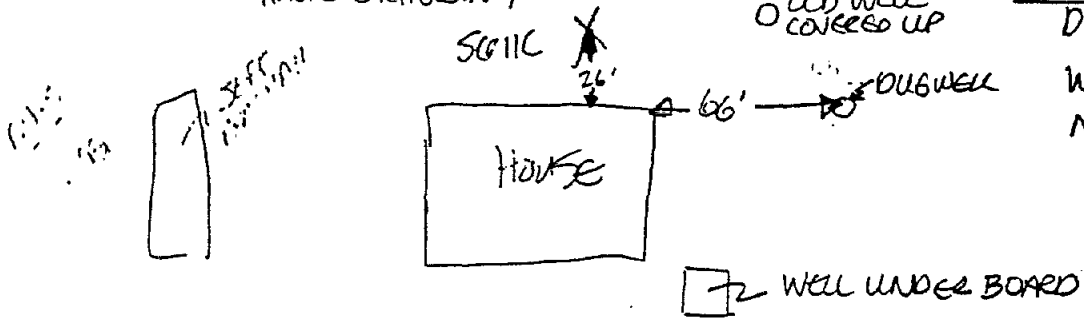
Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample:

USE – WATER BROWN, ONLY USE FOR SHOWERS, WASHING
HAUL DRINKING WATER IN,

DUG WELL
DEPTH TO WATER – 1.2'
WATER DEPTH – 3.5'
NEVER DRY



SAND BANK LD

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: JAMES T., DR. & ROSELYN A. STIFFLER

Date:

Address: Street - R.D. #1, BOX 804A

Phone (814) 942-7949

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: ~200'-225'

Casing Depth/Diameter: BELOW GROUND

Depth to consolidated rock:

Driller: ALB RIGHT ?

Date Drilled: ~76/77

Pump type: SUBMERSIBLE

Depth of Intake: 3

Reported yield (or flow if a spring):

No. of persons served:

Aquifer:

Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): NONE

Well access for water level measurement (sketch well head details at bottom): NEED HELP TO ACCESS

Depth to water:

Date:

Time:

Measuring point AGS (+ or -):

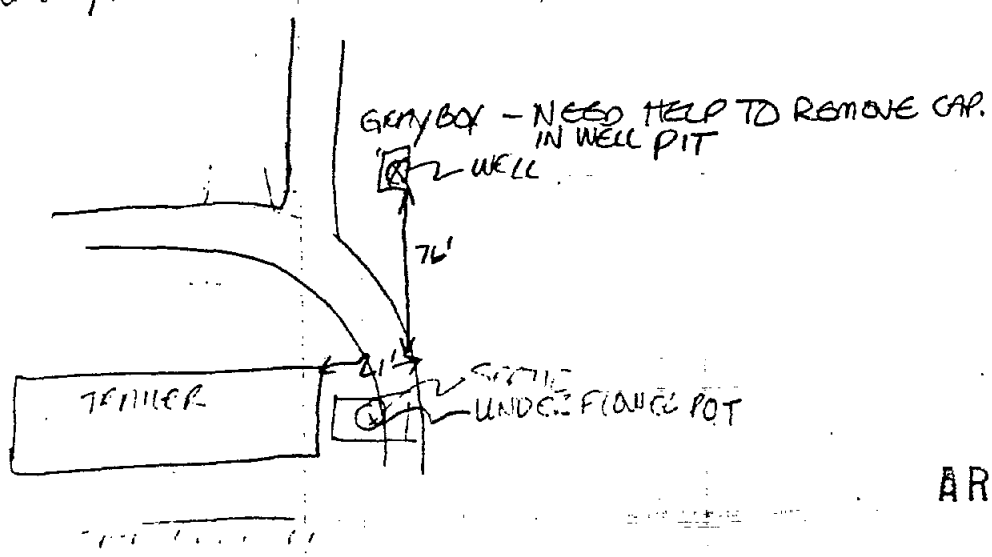
Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample: CALL

WATER-QUALITY?



AR303733

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: GLENN E. & HILDE STOTLER BEEN HERE 24 YRS **Date:** 7-28-88

Address: Street - R.D. #1, BOX 803 **Phone:** (814) 942-4119 UNLISTED

City - ALTOONA, PA 16601

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:
SUNKEY? — WILL ASK HUSBAND

Elevation:

Well Depth: ~200' **Casing Depth/Diameter:**

Depth to consolidated rock:

Driller: **Date Drilled:** >24 YRS AGO

Pump type: SUBMERSIBLE PUMP **Depth of Intake:**

Reported yield (or flow if a spring): **No. of persons served:** 6, 2 HOMES

Aquifer: **Water-Bearing Zones:**

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): NONE

Well access for water level measurement (sketch well head details at bottom): IN PUMP [illegible] TO [illegible] SPOT, COLLECT WATER FROM TAP.

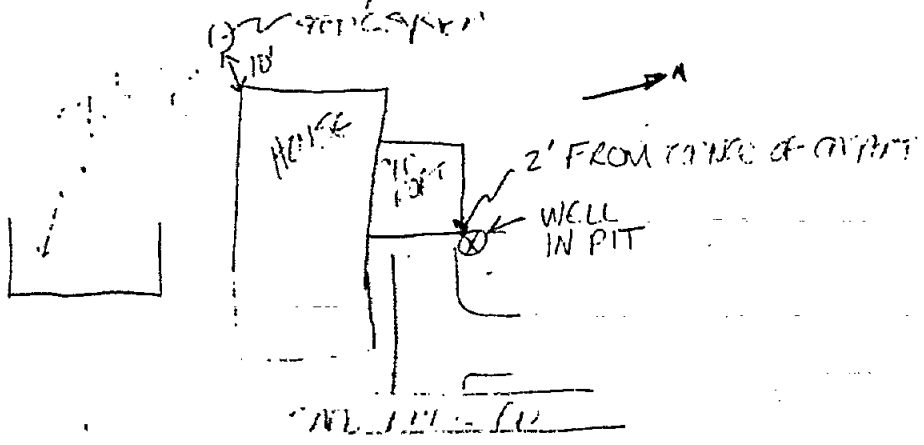
Depth to water: **Date:** **Time:**

Measuring point AGS (+ or -): -4' **Use prior to measurement:**

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no) CALL JUDY STOTLER TO INFORM

Acceptable time to collect sample:
[illegible] — PIT SOMETHING IN @ PINEPORT (DIGGING SEPTIC OR SOMETHING) AND [illegible] — CHECKED UP AFTER FINISHED IN PINEPORT.



AR303734

BLATT OWNED G. STOTLER RESIDENT
*YARD LITE FIXED

MAIL RECENT REPORTS
IF WATER QUALITY

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

Owner: JAMES H. & JUDITH E. STOTLER

Date: 7-28-88

Address: **Street** - R.O. 1, BOX 802
SAND BANK ROAD
City - ALTOONA, PA 16601

Phone: (814) 944-0182
JOSIE STOTLER (814) 942-4455

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth: 180'

Casing Depth/Diameter:

Depth to consolidated rock:

Driller: JOHNNY BLATT HAD DRILLED - ASK HIM

Date Drilled: < JUNE 1967

Pump type: SUBMERSIBLE

Depth of Intake:

Reported yield (or flow if a spring):

No. of persons served: 15

Aquifer: [illegible]

Water-Bearing Zones:

Use of supply (domestic, agricultural, etc.):

Treatment (softening, filtration, etc.): NONE
[illegible]

Well access for water level measurement (sketch well head details at bottom):

Depth to water: **Date:** **Time:**

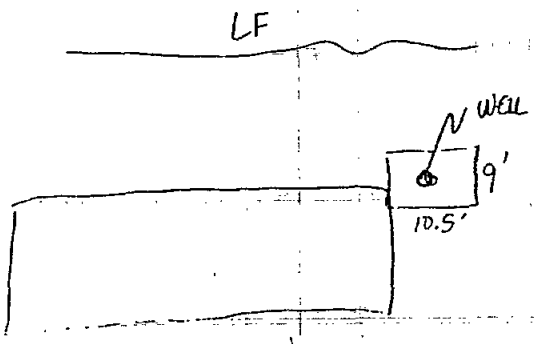
Measuring point AGS (+ or -): **Use prior to measurement:**

Best time during day for routine W.L. measurement: CALL IN ADVANCE TO SHUT OFF WATER TO ALL TRAILERS

Permission to sample well at later date? (yes/no) CALL FIRST

Acceptable time to collect sample:

** [illegible] LADDER TO ACCESS PIT
** [illegible] CALL IN THREE WHEELERS



AR303735

TABLE 9-2
DELTA RI/FS
RESIDENTIAL WELL INVENTORY FORM

AFTER 9 PM LEAVES @ ~5 am

Owner: SHANLEY — DIANE + BOB ULRICH

Address: Street - R.D. #1, BOX 799

City - ALTOONA, PA 16601

Date: 7-28-88

Phone: (814) 944-7294

Location of well in relation to house (sketch at bottom):

Description of features surrounding well which may affect water quality or hydraulics:

Elevation:

Well Depth:

Depth to consolidated rock:

Casing Depth/Diameter: 6" GALVANIZED CASING

Driller:

Pump type:

Date Drilled:

Reported yield (or flow if a spring):

Depth of Intake:

Aquifer:

No. of persons served: 4

Use of supply (domestic, agricultural, etc.):

Water-Bearing Zones:

Treatment (softening, filtration, etc.):

Well access for water level measurement (sketch well head details at bottom):

Depth to water:

Date:

Time:

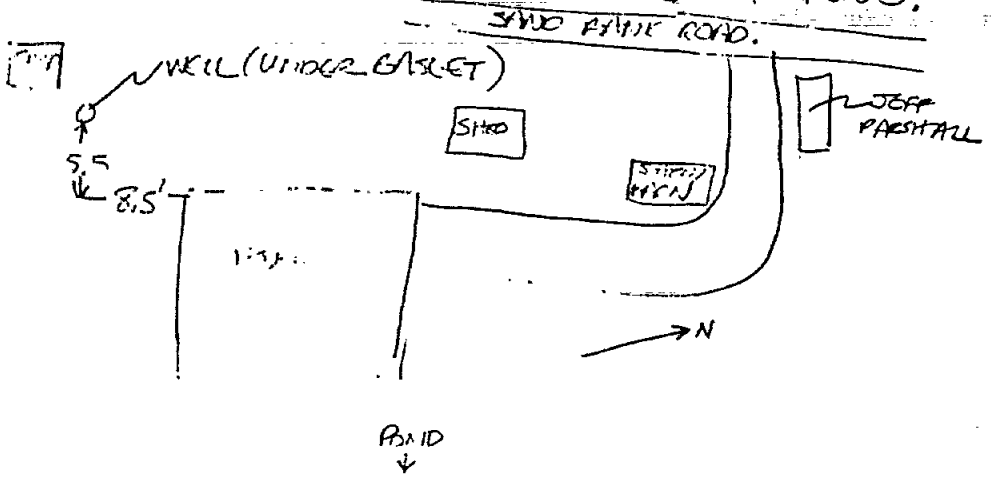
Measuring point AGS (+ or -): 1.4'

Use prior to measurement:

Best time during day for routine W.L. measurement:

Permission to sample well at later date? (yes/no)

Acceptable time to collect sample: CALL FIRST

USE: DON'T USE TO DRINK, BRINGS IN WATER TO COOK + DRINK, WELL WATER HAS IRON

WELL HAS NEVER CLEARED SINCE DUG OUT POND.