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Bureau of Hazardous Waste
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Substances Regulation

REPORT FOR
INSTALLATION OF ON-SITE MONITORING WELLS
TEXACO'S INACTIVE DISPOSAL SITE
BEACON, NEW YORK

Submitted to:

Texaco, Inc.
Beacon, New York

O.H. Materials Corp.

Blaine Fresco
Blaine Fresco
Hydrogeologist

June 18, 1986
Project File No. 2755



THE ENVIRONMENTAL SERVICES COMPANY

O.H. MATERIALS CO.
16406 U.S. Route 224 East
P.O. Box 551
Findlay, Ohio 45839-0551

Phone: 419-423-3526
800-537-9540 (24 hr)
800-537-5660 (in Ohio)
Telex: 298248 OHMI UR (RCA)

June 18, 1986

Mr. Michael Gallagher
Texaco Inc.
P.O. Box 509
Old Glenham Road
Beacon, New York 12508

Dear Mr. Gallagher:

RE: Installation of on-site monitoring wells, Texaco's Inactive
Disposal Site, Beacon, New York

O.H. Materials Corp. (OHM) is pleased to submit this report for
the installation of on-site monitoring wells at Texaco's Inactive
Disposal Site, Beacon, New York.

Should you have any questions or if we can be of further
assistance to you please do not hesitate to contact me or Jim
Harrigan at (609) 443-2800.

Sincerely,

Blaine Fresco

Blaine Fresco
Hydrogeologist

BF:jl

pc: Project File No. 2755

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1.0 INTRODUCTION

At Texaco's request, OHM installed 5 on-site monitoring wells at Texaco's Inactive Disposal Site, Beacon, New York. These 5 monitoring wells replaced the 5 wells that were damaged during implementation of the site remedial action, OHM Project No. 2997, and which were required for post-remedial monitoring.

Prior to the installation of the monitoring wells, OHM performed a site investigation and reviewed existing data to determine if a change in the number or placement of the wells is warranted and if a reduction in the number of wells could provide adequate post-remedial monitoring. The subsequent report, which is contained in Appendix A, recommended replacement of all of the damaged wells which were required for post-remedial monitoring.

The 5 monitoring wells installed included 4 overburden wells and 1 rock well.

2.0 INSTALLATION OF MONITORING WELLS

Installation of the 5 monitoring wells began on Tuesday, April 15, and was completed on Friday, April 18, 1986. Rochester Drilling of Rochester, New York, was retained to install the wells.

Prior to the start of work, representatives of OHM met with Texaco's representatives to verify well locations relative to the locations of the damaged wells. Figure 2.1 shows the monitoring well locations.

Borings for the overburden wells, Nos. DB-7A, DB-8A, DB-13A, and UC-1A; were advanced using hollow stem augers. The boring for the rock well was advanced using a hollow stem auger until bedrock was encountered. A 3-inch diameter core barrel was then used to advance the boring into bedrock. Geologic logs for each well were maintained by OHM's on-site hydrogeologist. These logs, contained in Appendix B, also show monitoring well construction details.

Following completion, all wells were developed by pumping to a clear discharge.

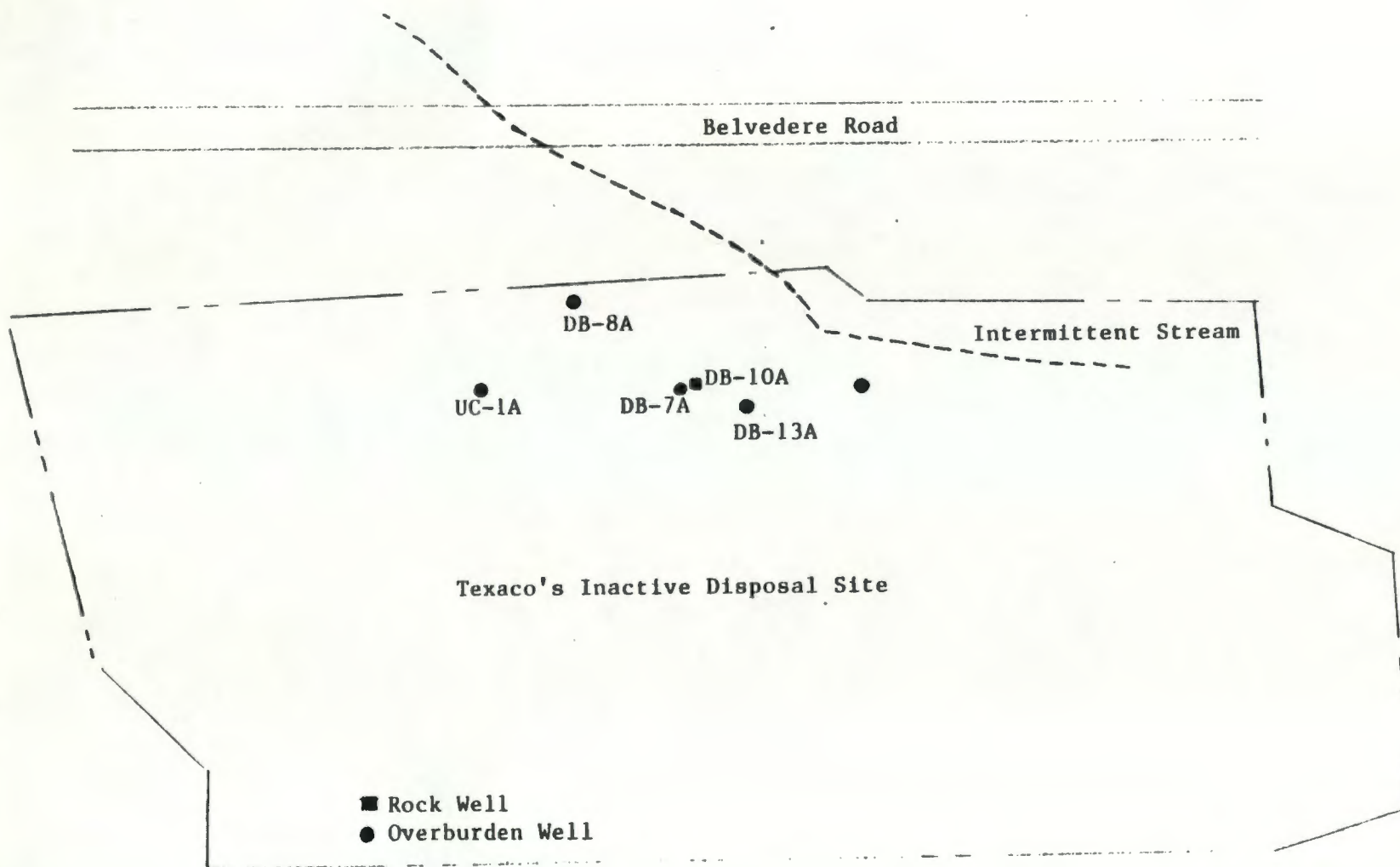


Fig. 2.1

Monitoring Well Locations

Beacon

New York

O. H. MATERIALS CO.

EMERGENCY RESPONSE AND
ENVIRONMENTAL RESTORATION

BOX 151 FINDLAY OHIO
416423 3426 BOX/S37 9540

PROJECT

DRAWING

REVISION

SCALE	DRAWN BY	NO.	DATE	REVISION	BY
NTS					
DATE	CHECKED				
SHEET ___ OF ___	APPROVED				

APPENDIX A
ASSESSMENT OF SITE CONDITIONS

March 25, 1986

Mr. Michael Gallagher
Texaco, Inc.
Research, Environmental, & Safety Dept.
P.O. Box 509
Old Glenham Road
Beacon, New York 12507

Dear Mr. Gallagher:

RE: Replacement of On-site Monitoring Wells for Post-Remediation
Monitoring, Inactive Disposal Site, Beacon, New York

In accordance with your request, we have reviewed existing data and performed an inspection of the site for the purpose of assessing site conditions with regard to the replacement of monitoring wells which were damaged or removed during remedial excavation operations. The purpose of this assessment specifically, is to determine if a change in the number or placement of the wells is warranted and if a reduction in the number of wells could provide adequate post-remediation monitoring.

The monitoring wells which are slated for replacement are listed below:

Overburden Wells

DB-7
DB-8
DB-13
UC-1

Bedrock Wells

DB-10

The other wells to be used in the post-remediation monitoring program were found to be intact.

To determine if a change should be made in the number or the placement of the wells, the following factors were considered:

- o The post-excavation groundwater flow conditions as compared to the conditions observed prior to excavation operations
- o The levels of contamination previously observed at the monitoring wells and the locations of the monitoring wells with respect to areas of contamination which were addressed during remedial excavation operations
- o The locations of the monitoring wells with respect to the site boundary
- o The impact on the total information package provided by the monitoring program which would occur if a monitoring well were to be omitted

Groundwater Flow Conditions

Groundwater levels were measured at selected on-site wells and off-site wells completed in the overburden on February 28. The observed groundwater elevations are listed in Table 1. Interpreted groundwater elevation contours, the locations of wells at which water level measurements were measured, and the locations of the wells slated for replacement are shown in Figure 1.

The water level observed at DB-31 is anomalous with respect to the level observed at DB-16. DB-16, however, was dry on past dates for which water level measurements are available for DB-31, and no basis for comparison of pre-remediation conditions versus post-remediation water levels between the two wells exists. In light of questions raised concerning the possibility that there may be standing water in an unscreened section of casing at the base of DB-16, however, the water level measured at DB-31 was judged to be more reflective of the groundwater level in the vicinity. The casing of DB-13 appears to have been pushed downward, and the calculated water level elevation is judged to be unrepresentative.

Comparison of the interpreted directions of groundwater flow indicated in Figure 1 with those in the December 7, 1984 report to Texaco (Project No. 1767) indicate that the changes in topography which have resulted from excavation operations have not significantly affected the groundwater flow regime at the site.

Observed Pre-Remediation Contaminant Levels

Analyses of groundwater samples prior to remediation operations (reported December 7, 1984) indicated the presence of organic constituents in the ground water at monitoring wells DB-13, DB-7, DB-8, and DB-10.

Location of Wells With Respect to the Site Boundary

Monitoring well DB-8 was located immediately adjacent to the site boundary. The remainder of the wells were at interior locations.

Impact on Monitoring Program

Monitoring well DB-8 was the only well located downgradient of former Chemical Burial Site No. 1. Furthermore, it was located at the site boundary. Omission of DB-8 would result in no monitoring of groundwater quality downgradient from former Chemical Burial Site No. 1.

The location of monitoring well UC-1 is strategic because of its proximity to the location of the groundwater divide. The omission of UC-1 would provide for no water level measurement in the vicinity of the divide.

Water quality data from DB-10 indicates the presence of organic contamination in the bedrock. Omission of DB-10 would provide for no monitoring of the contaminant levels at this location. Although trends in water levels at bedrock wells have previously been observed to be similar to those observed in overburden wells, groundwater flow in fractured bedrock such as that underlying the site occurs along discrete pathways. There is no guarantee, therefore, that bedrock monitoring well DB-11, located near the site boundary next to DB-17, will serve satisfactorily as a downgradient monitoring point for the contamination previously observed at DB-10.

The DB-7 and DB-13 locations are both immediately downgradient of former Chemical Disposal Site No. 2. Omission of both wells would provide for no downgradient monitoring between the former chemical disposal area and monitoring well DB-17, located near the site boundary. If post-remediation monitoring were to be performed only at the site boundary, and if subsequent monitoring were to indicate that contamination is still present in the groundwater, that contamination problem would affect a considerable volume of soil by the time of its detection. Early detection (i.e. monitoring at locations closer to the potential source) is in the best interests of Texaco. One overburden monitoring well, located centrally between the DB-7 and DB-13 locations will provide the minimum degree of monitoring necessary for early detection.

Monitoring at both the DB-7 and DB-13 locations, however, would provide optimum monitoring downgradient of the former Chemical Disposal Site No. 2 location. Furthermore, the casing of DB-13 is still standing and it may be possible to repair the well. In light of the fact that the highest levels of contamination were detected downgradient of this chemical disposal site, it is in the best interests of Texaco to provide the optimum level of monitoring in this area (i.e., replace both DB-7 and DB-13).

Nested Well Construction Versus Construction in Individual Boreholes

With regard to nested construction of a bedrock well and an overburden well at the DB-10/DB-7 location, several technical factors warrant consideration:

- o Special care is necessary to isolate various screen sections to ensure the representativeness of each sample at a particular depth. Bentonite grout is usually used for the creation of an impermeable seal when backfilling the annular space of a well borehole. Grout is susceptible to shrinkage due to temperature changes during curing and from poor bonding between the grout and the casing surface. The increased surface area from several casings within a single borehole increases the potential channeling of surface water or water between wells along the casing and soil or seal interface.
- o The construction of an overburden well with gravel packing opposite its screening within the same borehole as a bedrock well is not compatible with the recommended construction of a bedrock monitoring well (i.e., complete grouting of the annular space). The recommended construction of a bedrock monitoring well is to drill an oversize borehole through the overburden into competent rock, to grout a steel casing in place by completely filling the annular space with a granular bentonite/cement mixture, and to continue to drill into the bedrock to complete the well. If bedrock stability problems necessitate the installation of screening in the bedrock well, the screening should be installed within the steel cased/open borehole.
- o Nested completion of wells within a single borehole can only be recommended in the limiting case of a single aquifer in which monitoring of vertical contaminant stratification is desired, and where the reduction in total drilling footage will result in a substantial savings. Nested completions are not

March 25, 1986

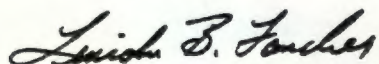
recommended under any circumstances for situations in which more than one aquifer is involved or in adjacent formations having limited hydraulic communication because of the increased chances of mixing of contaminated waters between formations.

Recommendations

All monitoring wells slated for replacement for the post-remediation monitoring program should be replaced. The very fact that the wells were removed during remedial operation points to the strategic nature of their locations. An attempt should be made to repair monitoring well DB-13 prior to installing a new well at that location. If attempts to repair DB-13 are successful, the casing should be re-surveyed. A bedrock well and an overburden well should be constructed in individual boreholes at the DB-10/DB-7 location.

If you have any questions concerning the information presented in this letter, please do not hesitate to contact Mr. Blaine Fresco or me at (609) 443-2800.

Sincerely,



Lincoln B. Fancher
Hydrogeologist

LBF:jl

pc: Blaine Fresco
Project File No. 2755

TABLE 1
OBSERVED GROUNDWATER ELEVATIONS
2/28/86
(OVERBURDEN WELLS)

<u>Well No.</u>	<u>TOC Elev*</u> <u>(Ft.)</u>	<u>Meas. Depth to</u> <u>Water (FT.)</u>	<u>Groundwater Elev.</u> <u>(Ft.)</u>
On-Site Wells:			
DB-31	236.23	7.11	229.12
DB-13 **	236.82	8.61	228.21
DB-17	232.01	5.65	226.36
DB-14	243.56	9.63	233.93
UB-5	251.13	15.39	235.74
DB-16	240.63	15.13 ***	225.50
DL-8	239.66	3.31	236.35
DB-6B	236.45	(Unable to open lock) ****	
Off-site Wells:			
MW-1A	262.07	7.26	254.81
MW-2A	222.30	6.00	216.30
MW-3A	233.60	1.79	231.81
MW-4A	273.85	(Unable to measure) *****	

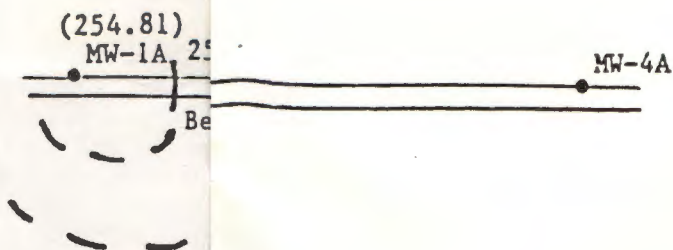
* Top of casing elevations from 12/7/84 report to Texaco, Project No. 1767.

** Casing damaged, may not be representative.

*** May not be representative.

**** Not used since 1981, may not be functional.

***** Hydraulic head above ground surface, well flowing.



Site Bound

Approx.
location of
G.W. flow
divide

LEGEND:

- Monitoring Well - Overburden
- □ Location of Monitoring Well
To be Replaced
(Circle = Overburden,
Square = Bedrock)
- Interpreted direction of
groundwater flow

Note: All Locations Approximate

Approximate
Scale:

0 50 100

(Feet)

SCALE As Shown	DRAWN BY LBF	NO.	O. H. MATERIALS CO.	
DATE 03/01/86	CHECKED		EMERGENCY RESPONSE AND ENVIRONMENTAL RESTORATION	
SHEET 1 OF 1	APPROVED		BOX 551 419.423-3526	FINDLAY, OHIO 800.537-9540
		SUBJECT 2755	DRAWING	REVISION

APPENDIX B
GEOLOGIC BORING LOGS

O H M

PAGE 1 OF 2

PART 1

JOB NO.

2755

BORE HOLE NO. UC-1A

PROJECT Texaco		LOCATION Inactive Disposal Site, Beacon NY	
DRILLING CONTRACTOR Rochester Drilling		DRILLING EQUIPMENT Hollow Stem Auger	
HYDROGEOLOGIST Mark Erickson		DRILLER Ed Ganier	
DATE START/TIME 4/15/86	DATE FINISH/TIME	SURFACE ELEVATION	TOTAL DEPTH 21.6'
WELL CASING 2" PVC	SCREEN TYPE 2" PVC	LENGTH 15'	SLOT .010

GROUND WATER

DATE	TIME	DEPTH	WEATHER	TYPE	CASING	CORE	SAMPLER	TUBE
4/15/86		2.9'		DIAMETER				
				HAMMER WEIGHT				
				FALL				

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	BORE HOLE LOG		GRAPHIC LOG
				LITHOLOGIC DESCRIPTION	REMARKS	
1				Silt and fine sand, Brown with gravel	Lithologic description taken from auger cuttings.	B cement casing
2				some cobbles, trace boulders.		
3				Disturbed to approximately 10' BGS		
4						
5						
6						
7						
8						
9						
10						
11				10'-17' BGS, soil dense, balls easily (Glacial Till)		

JOB NO 2755

BORE HOLE NO UC-1A

PROJECT Texaco

LOCATION Inactive Disposal Site, Beacon NY

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY			GRAPHIC LOG
				LITHOLOGIC DESCRIPTION	REMARKS	
13						.015 Ottawa sand .010 PVC screen
14						
15						
16						
17						
18				Brown sand and silt, trace gravel 17'-21.6'	saturated, caving sand	
19						
20						
25				EOB	Auger refusal (bedrock) @ 21.6'	
					boring overdrilled to 21.6' (bedrock) then collapsed to 18'. 1' sand put in to set screen at desired depth (17').	
					Well developed @ 0.6 gpm	

OHM

PAGE 1 OF 1

PART 1

B NO. 2755

BORE HOLE NO. DB-13A

PROJECT Texaco		LOCATION Inactive Disposal Site, Beacon NY	
DRILLING CONTRACTOR Rochester Drilling		DRILLING EQUIPMENT Hollow Stem Auger	
HYDROGEOLOGIST Mark Erickson		DRILLER Ed Ganier	
DATE START/TIME 4/15/86	DATE FINISH/TIME	SURFACE ELEVATION	TOTAL DEPTH 12.6'
WELL CASING 2" PVC	SCREEN TYPE 2" PVC	LENGTH 5'	SLOT .010

GROUND WATER					CASING	CORE	SAMPLER	TUBE
DATE	TIME	DEPTH	WEATHER	TYPE				
4/16/86		10.8'		DIAMETER				
				HAMMER WEIGHT				
				FALL				

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	BORE HOLE LOG		GRAPHIC LOG
				LITHOLOGIC DESCRIPTION	REMARKS	
1				Silt and fine sand, brown, with some cobbles, some clay, trace boulders. Disturbed to 3'	Lithologic description taken from auger cuttings.	
2						
3				3'-12.6' dense brown glacial till.		
4						
5						
6						
7						
8						
9						
10						
11				saturated with caving sand @ 11.4'	well developed @ 1.6 gpm	
12				Auger refusal (bedrock) @ 12.6'		

015 Ottawa sand
Bent.
cement grout
PVC casing
PVC screen

O H M

PAGE 1 OF 2

PART 1

JOB NO.

2755

BORE HOLE NO. DB-8A

PROJECT Texaco		LOCATION Inactive Disposal Site, Beacon NY	
DRILLING CONTRACTOR Rochester Drilling		DRILLING EQUIPMENT Hollow Stem Auger	
HYDROGEOLOGIST Mark Erickson		DRILLER Ed Ganier	
DATE START/TIME 4/16/86	DATE FINISH/TIME	SURFACE ELEVATION	TOTAL DEPTH 20'
WELL CASING 2" PVC	SCREEN TYPE 2" PVC	LENGTH 10'	SLOT .010

GROUND WATER					CASING	CORE	SAMPLER	TUBE
DATE	TIME	DEPTH	WEATHER	TYPE				
4/17/86		6.4'		DIAMETER				
				HAMMER WEIGHT				
				FALL				

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	BORE HOLE LOG		GRAPHIC LOG
				LITHOLOGIC DESCRIPTION	REMARKS	
1				Brown sand silt, with gravel and clay, some cobbles, trace boulders. undisturbed from 0-14' BGS. Dense, slightly plastic. Wet from 7'	Lithologic description taken from auger cuttings	cement grout
2						Bent.
3						PVC casing
4						
5						
6						
7						
8						
9						
10						
11						
12						

OHM

PART 2

PAGE 2 OF 2

JOB NO 2755

BORE HOLE NO. DB-8A

PROJECT Texaco

LOCATION Inactive Disposal Site, Beacon NY

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	LITHOLOGIC DESCRIPTION	REMARKS	GRAPHIC LOG	
						.015 sand	.010 PVC screen
13							
14							
15				Brown sand and silt with gravel, some clay. Saturated with caving sand 14'-16'			
16							
17				Gray sand and silt with gravel, some clay. Saturated with caving sand.			
18					Cave in from 20-15.3'. Well developing by pumping @ approx. .1 gpm		
19							
20							
21				EOB			

O H M

PAGE 1 OF 3

PART 1

JOB NO. 2755

BORE HOLE NO. DB-10A

PROJECT Texaco		LOCATION Inactive Disposal Site, Beacon NY	
DRILLING CONTRACTOR Rochester Drilling		DRILLING EQUIPMENT Hollow Stem Auger/ Core Barrel	
HYDROGEOLOGIST Mark Erickson		DRILLER Ed Gainer	
DATE START/TIME 4/16/86	DATE FINISH/TIME 4/18/86	SURFACE ELEVATION	TOTAL DEPTH 35'
WELL CASING 5" steel/3" steel	SCREEN TYPE N/A	LENGTH	SLOT

GROUND WATER

DATE	TIME	DEPTH	WEATHER	TYPE	CASING	CORE	SAMPLER	TUBE
4/16/86		4.2'		DIAMETER		3" OD		
				HAMMER WEIGHT				
				FALL				

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	BORE HOLE LOG		GRAPHIC LOG
				LITHOLOGIC DESCRIPTION	REMARKS	
1				Brown silt and fine sand with gravel, trace boulders. Disturbed to approximately 12.0' BGS.	Lithologic description taken from auger cuttings.	5" steel casing cement grout 3" steel casing
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

JOB NO 2755

BORE HOLE NO. DB-10A

PROJECT Texaco

LOCATION Inactive Disposal Site, Beacon NY

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY			GRAPHIC LOG
				LITHOLOGIC DESCRIPTION	REMARKS	
13				Undisturbed soil, dense balled easily, saturated 12'-22'		5" steel casing cement grout 3" steel casing
14						
15						
16						
17						
18						
19						
20						
21						
22						
23				22'-27': Dark grey dolomite with calcite stringers. Moderately fractured. No fossils, dense.		
24						
25				27'-32': Dolomite, calcite, gravel. Loose, no solid core. Gravel round to subround.		open boring
26						
27						
28						
29						

PART 2

OHM

PAGE 3 OF 3

JOB NO 2755

BORE HOLE NO. DB-10A

PROJECT Texaco

LOCATION Inactive Disposal Site, Beacon NY

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	LITHOLOGIC DESCRIPTION		REMARKS	GRAPHIC LOG
30							open boring
31							
32							
33				32'-35': Light grey to tan dolomite, hard, dense		Boring caved in from 35'-30'.	
34							
35				EOB			
36							
37							

OHM

PAGE 1 OF 2

BORE HOLE NO. DB-7A

PART 1

JOB NO. 2755

PROJECT Texaco

LOCATION Inactive Disposal Site, Beacon NY

DRILLING CONTRACTOR Rochester Drilling

DRILLING EQUIPMENT Hollow Stem Auger

GEOLOGIST Mark Erickson

DRILLER Ed Gainer

DATE START/TIME 4/15/86

DATE FINISH/TIME

SURFACE ELEVATION

TOTAL DEPTH 15'

WELL CASING 2" PVC

SCREEN TYPE 2" PVC

LENGTH 10'

SLOT .010

GROUND WATER

DATE	TIME	DEPTH	WEATHER	TYPE	CASING	CORE	SAMPLER	TUBE
4/15/86		4.0'		DIAMETER				
				HAMMER				
				WEIGHT				
				FALL				

MARKS

SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	BORE HOLE LOG		GRAPHIC LOG
			LITHOLOGIC DESCRIPTION	REMARKS	
			Brown silt and fine sand with gravel, traces boulders. Disturbed to approx. 12.0' BGS.	Lithologic description taken from DB-10A	.015 Ottawa sand Bent. cement PVC casing PVC screen 13'-3'

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PAGE 2 OF 2

BORE HOLE NO. DB-7A

PART 2

JOB NO 2755

PROJECT Texaco

LOCATION Inactive Disposal Site, Beacon NY

REMARKS

DEPTH	SAMPLE NO.	BLOW COUNT PER 6"	RECOVERY	LITHOLOGIC DESCRIPTION		REMARKS	GRAPHIC LOG	
							sand	screen
13				Undisturbed soil, dense, saturated, balled easily 12'-15'		boring allowed to collapse 13'-15'.		
14								
15				EOB				
16								

