99444

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES

FIT PROJECT

TASK REPORT TO THE ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. 68-01-6056

Well Drilling
at

Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17

Revision Date: October 8, 1982

Presented to: Linda Y. Boornazian, Acting DPO
EPA Region III

Prepared by: _____
C. K. Lee

_____
Joseph G. McGovern, FITL III

ecology and environment, inc.

International Specialists in the Environmental Sciences

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at
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TDD No. F3-8202-04C
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SECTION 1

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SUMMATION AND FINDINGS

1.1 SUMMATION

The Delaware Sand and Gravel Landfill is located approximately two miles southwest of the City of New Castle, Delaware and immediately east of the Army Creek Landfill (DE-01). But both landfills are interconnected hydrogeologically, only divided topographically by the Army Creek.

The Delaware Sand and Gravel Landfill was alleged to contain drums of industrial chemical liquid waste. The purpose of this effort was to evaluate the contamination contribution of the Delaware Sand and Gravel site. Accordingly, three monitoring wells and two boreholes were developed during the period of June 28 to July 14, 1982. Groundwater sampling program was performed on July 14, 1982. The subsequent analytical results indicated the following:

o The groundwater flow direction in the study area is generally from the northwest to the southeast. This is the same pattern observed in November 1981.

o The groundwater elevation measured approximately 14 feet below mean sea level (MSL) in the drum-pit area.

o Groundwater sample (B-1), near the drum-pit area showed contamination as follows:

Lead (120 ppb)
1,2 Dichloroethane (1,500 ppb)
Trichloroethylene (27 ppb)
Benzene (180 ppb)
Phenol (360 ppb)
Methylene Chloride (4,000 ppb)
Toluene (1,200 ppb)
Ethylbenzene (16 ppb)

o Groundwater sample (B-4), near the refuse area, downgradient of the drum-pit area showed contamination as follows:

Benzene (57 ppb)
Toluene (880 ppb)
Ethylbenzene (18 ppb)

o The groundwater sample of Well #39, near the recovery well #13 did not contain significant levels of priority pollutants, except lead (320 ppb), arsenic (120 ppb) and nickel (60 ppb).

o Groundwater and cutting samples of B-5 did contain a small amount of pollutants that were similar to the pollutants of the drum-pit area. This could be due to groundwater fluctuation in this area.

o A soil cutting sample from B-2, located in the drum-pit area, showed a concentration of 262 ug/g (ppm) of PCB-1248.

o Trace amounts of ethylene and toluene were found in the stained soil near the entrance of the landfill.

1.2 FINDINGS

The observations cited above indicate that the groundwater and soil have been contaminated by the drum-pit area.

SECTION 2

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FIELD TRIP REPORT

2.1 INTRODUCTION

The Field Investigation Team, Region III (FIT III) developed a subcontract to drill three monitoring wells and two boreholes (See Figure 1), to better assess the constituents of contamination from Delaware Sand and Gravel Landfill Site, based upon recommendations of a previous hydrogeologic study (TDD No. F3-8108-11B).

On June 28 through July 14, 1982, the subcontractor, A. C. Shultes and Sons, Inc., a licensed driller in Delaware, drilled five holes under the supervision of FIT III. After drilling was completed, FIT III conducted sampling of the groundwater and the drilling cuttings and forwarded the samples to the labs for analyses. The FIT III members included Frank Quirus, Loren Lasky, Doug Taylor, Bill Wentworth, David Nickerson, Jim Vogel, Terrence Shannon and C. K. Lee.

The weather conditions for the operation period were sunny, hot and humid with occasional thunderstorms. The air temperature ranged 85° to 95° F.

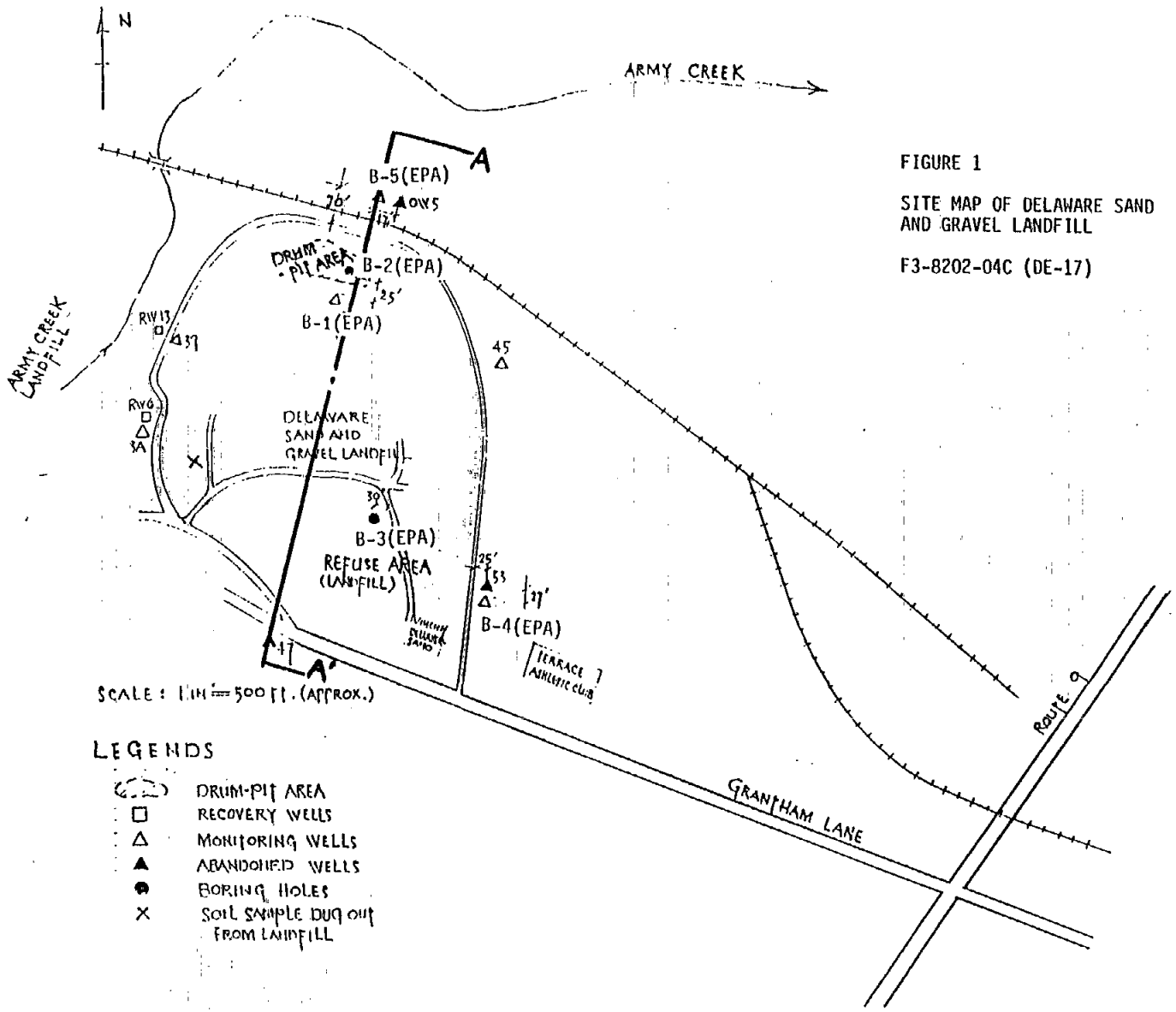

FIGURE 1

SITE MAP OF DELAWARE SAND AND GRAVEL LANDFILL

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2.2 CONTACTS

Christine Hladchuk
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Edward Tatnall Building
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(302) 736-5739

Dave Clark
New Castle County Engineer
Public Building
11th and King Streets
Wilmington, DE 19801
(302) 366-7800

Charles Hurd
Amoco Chemical Corporation
P.O. Box 312
New Castle, DE 19720
(302) 322-1878

Timothy Rafferty, Lawyer
Custom House Plaza, Suite 514
Wilmington, DE 19801
(302) 656-8295 Changed 302-239-2305

Vincent DellAversano, Owner
Delaware Sand and Gravel Company
229 Grantham Lane
New Castle, DE 19720
(302) 328-3491

Charlie Kramer (Drillers)
Dale Godsil
Jim Schultes
Ted Budzynski
A.C. Schultes and Sons, Inc.
664 South Evergreen Avenue
Woodbury, NJ 08096
(609) 845-5656

2.3 PERTINENT COMMENTS

Robert J. Touhey, DNERC Manager -

o In a letter of June 22, 1982 to Walter Lee, Chief of EPA III, Mr. Tohey approved the plan for the drilling work to monitor the Delaware Sand and Gravel site.

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Emil Onuschak, Chairman, Delaware State Board of Registration of Geologists -

o In his letter of June 8, 1982 to Christine Hladchuk, EPA Region III, Project Officer, it stated that independent geologists with whom a federal agency contracts to do geological work in Delaware must be under the supervision of a geologist who is an employee of the federal government.

o EPA Region III appointed Stephen Platt as a Federal Geologist to supervise the drilling work at the Delaware Sand and Gravel site.

Dave Clark, New Castle County Engineer -

o In a telephone conversation of July 6, 1982, he gave verbal permission for drilling Well B-4 which is adjacent to the abandoned Well #53.

o Mr. Clark also mentioned that Well B-4 is on property that now belongs to Vincent DellAversano.

Timothy Rafferty, Lawyer for Delaware Sand and Gravel Company -

o In a telephone conversation of March 29, 1982, he stated that Delaware Sand and Gravel Company had granted permission to enter its property for the drilling work.

o In a telephone conversation of July 14, 1982, he said that the owner, Vincent DellAversano did not want split samples.

o A sample receipt was sent to Timothy Rafferty on July 21, 1982 for Mr. DellAversano's signature (See Document #11). But it had not yet been returned when this report was prepared.

Vincent DellAversano, Owner of Delaware Sand and Gravel Company -

o Mr. DellAversano was on site the morning of July 6, 1982. He was paid by Schultes for installing an access path to the B-4 site.

Charles Hurd, Amoco Chemicals -

o Amoco Chemicals Corporation granted permission to access and drill Well B-5 on its property (See Document #10).

o A sample receipt was supplied to Amoco (See Document #12).

2.4 MAGNETOMETER SURVEY

A "Unimag II" magnetometer was used to search for concentrations of buried magnetic (ferrous metal) objects in the drum-pit area, as well as in the refuse (landfill) area. These magnetometer surveys of selected locations were performed on July 2 and July 7, 1982.

The drum-pit area was a dumpsite for disposing industrial waste. A scan of the area with the HNU was conducted prior to the magnetometer survey on July 2, 1982. No readings above background level were detected on the surface of the site. Magnetic intensity measurements from the instrument's digital readout, in gamma, were recorded every 5 ft. along lines delineated in Figure 2. The general

FIGURE 2

MAGNETOMETER READINGS ON THE DRUM-PIT AREA (OBSERVED ON JULY 2, 1982)

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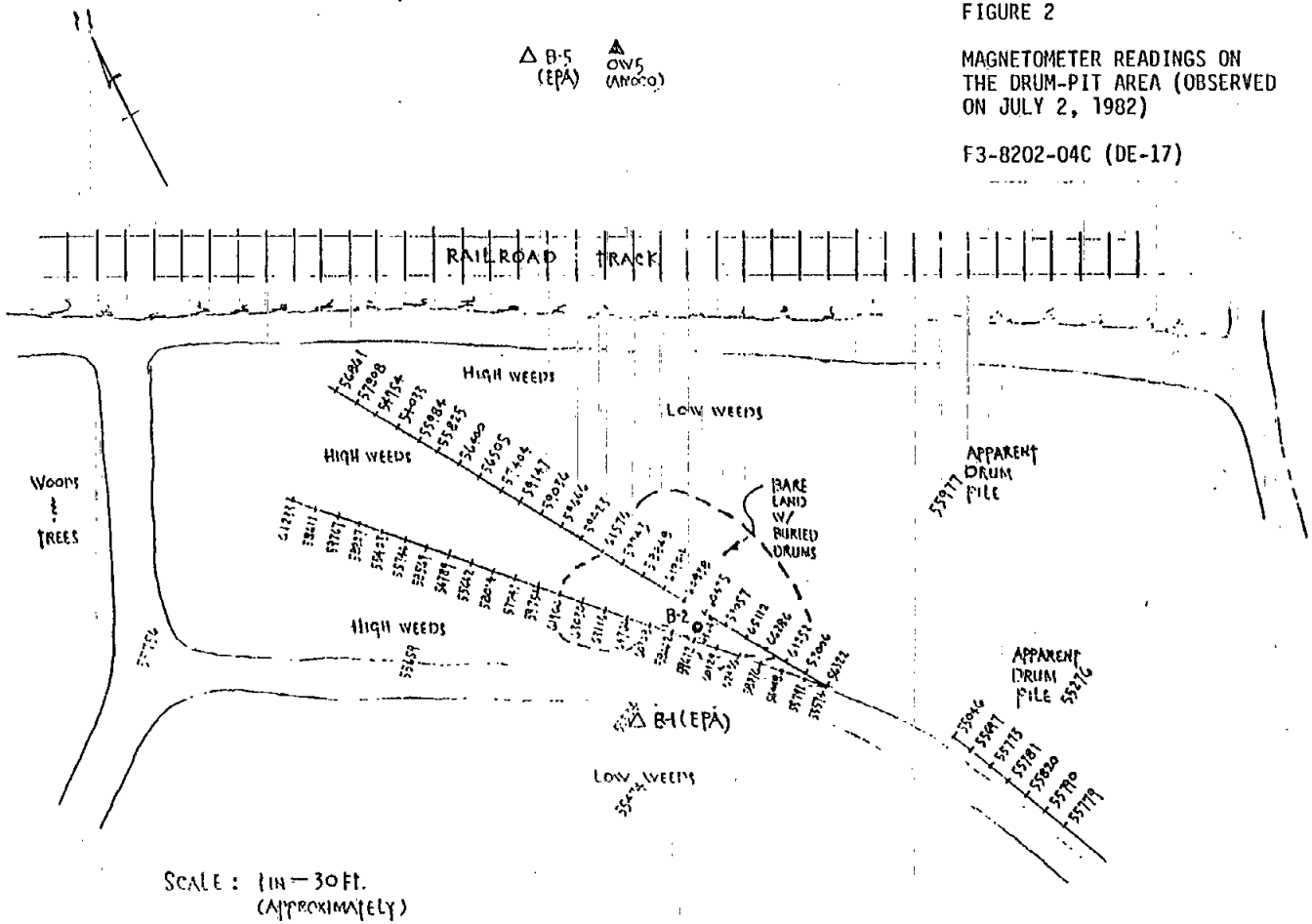

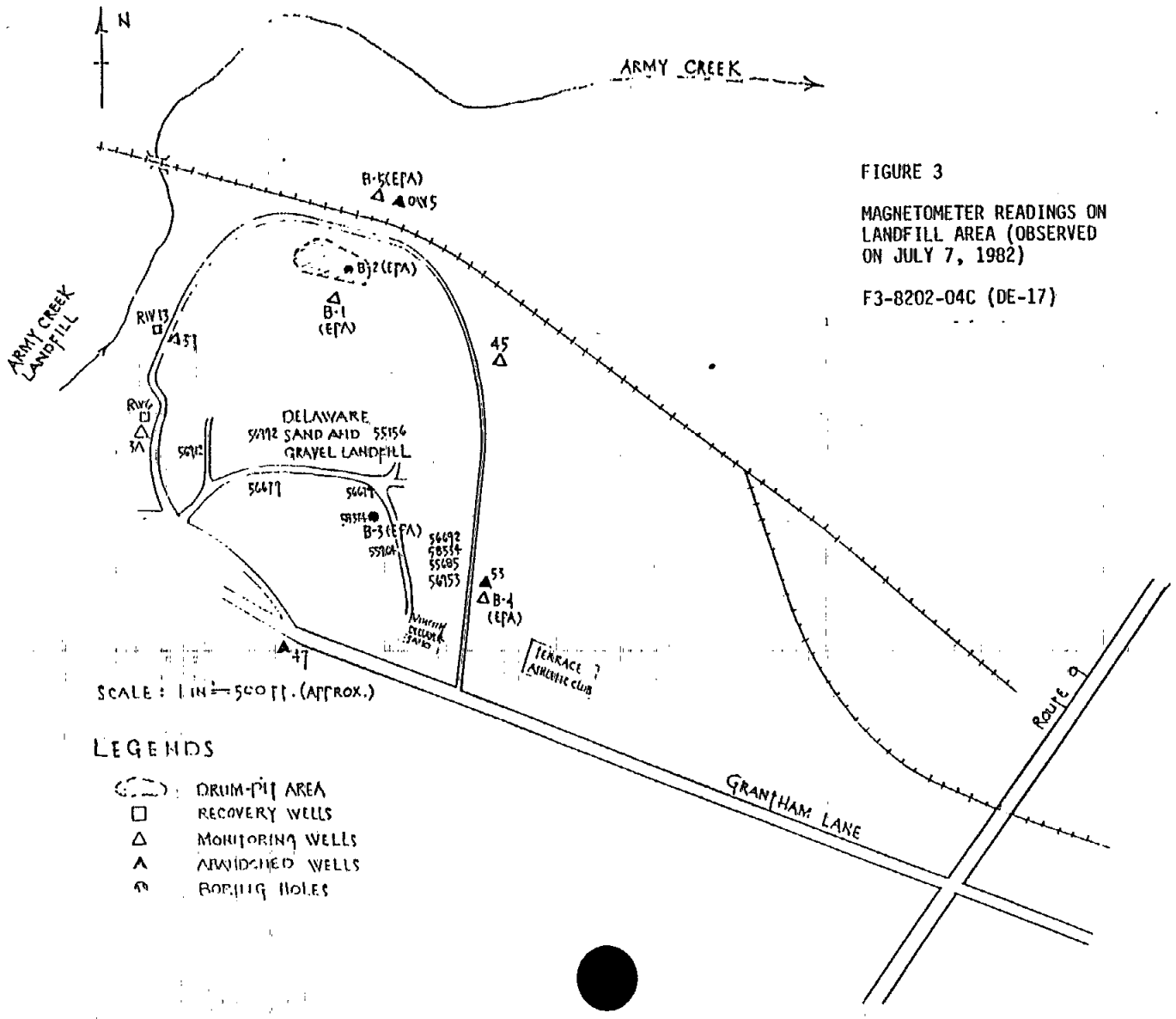

FIGURE 3

MAGNETOMETER READINGS ON LANDFILL AREA (OBSERVED ON JULY 7, 1982)

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reading in the drum-pit area was about 56,000 gamma. Areas with readings of greater than 60,000 gamma were arbitrarily considered as indicative of high metal concentration. The drum burial area is within the defined limits on Figure 2.

Scattered readings on the refuse (landfill) area are presented in Figure 3. A general background level in this area is also approximately 56,000 gamma. Few high readings above 58,000 gamma were recorded on the southeastern part of the landfill, but no correlating evidence was found to determine an exact location of buried drum concentrations.

2.5 DRILLING PERFORMANCE

The firm of A. C. Schultes and Sons, Inc., Woodbury, NJ was selected as the subcontractor on this project. Schultes operated a rotary drilling rig and an auger rig for boring the holes. The total drilling cost was $16,104.

Five holes were drilled during the period from June 28 to July 14, 1982. These were the following (See Figure 1 and Well Logs Figure 4 through 8).

o Well B-1 was installed on the southern side of the boundary path, outside of the drum-pit area. The drilled depth of this hole is 55 feet. This borehole is cased with a 4-inch steel pipe with a 10 ft. screen installed between 30 and 40 feet below grade.

o Borehole B-2 is located approximately in the center of the drum-pit area, about 25 ft. from Well B-1. B-2 was drilled 20 feet through the waste pit, and then filled with bentonite and cement after completion of the drilling.

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o Borehole B-3 is located in the center of the refuse or landfill area. The borehole was drilled to a 33-foot depth and filled with bentonite and cement after completing the hole.

o Well B-4 is located about 27 ft. from abandoned Well #53, on the southwestern part of the owner's property. The well was drilled to 102 feet and cased with 4" steel pipe, and screened between 85 and 95 feet below the ground surface.

o Well B-5 was installed about 17 ft. from abandoned well #OW5, on the northwestern side of the drum-pit area. The well is 150 feet deep and cased with a 4-inch steel pipe, screened between 110 to 120 feet below the ground surface.

Ecology and Environment, Inc. conducted a training session in the use of respiratory protective equipment and decontamination procedures at the Region III office on June 22, 1982. The drillers did wear personal protective clothing and respiratory protective equipment while drilling at the B-1, B-2 and B-3 sites.

Ecology and Environment, Inc. monitored ambient air with HNU continuously during drilling operations. No readings above background were detected in the ambient air. Some positive readings above the split spoon sampler and at the head of holes B-1 and B-2 were noted. Strong chemical odors were noted during drilling on the drum-pit area.

The drilling equipment was cleaned and rinsed with high pressure hot water prior to drilling the first hole, between subsequent holes and after completing the last hole.

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The drilling spoils, cuttings and the water generated in connection with the drilling work were dispersed on the ground. This process was discussed and agreed to by EPA Region III and the landowners (See Document #6).

The boreholes B-2 and B-3 were backfilled with bentonite and cement after completion (See Figures 5 and 6). The annular space for each newly installed well was sealed with bentonite and cement from 2 feet above the top of the screen to the ground level (See Figures 4, 7 and 8). Each well had 4-inch diameter stainless steel casing and screen, plus a protective steel outer casing at the surface with a locking cap. Detailed information on the drilling work, and observed groundwater elevations are listed in Table 1. A contour map of the observed groundwater elevations is shown in Figure 10 which indicates that the groundwater flow direction is south-easterly, with an approximate hydraulic gradient 0.02 ft. per ft. at the drum-pit area.

TABLE 1 - WELL INSTALLATION SUMMARY

Delaware Sand and Gravel Landfill
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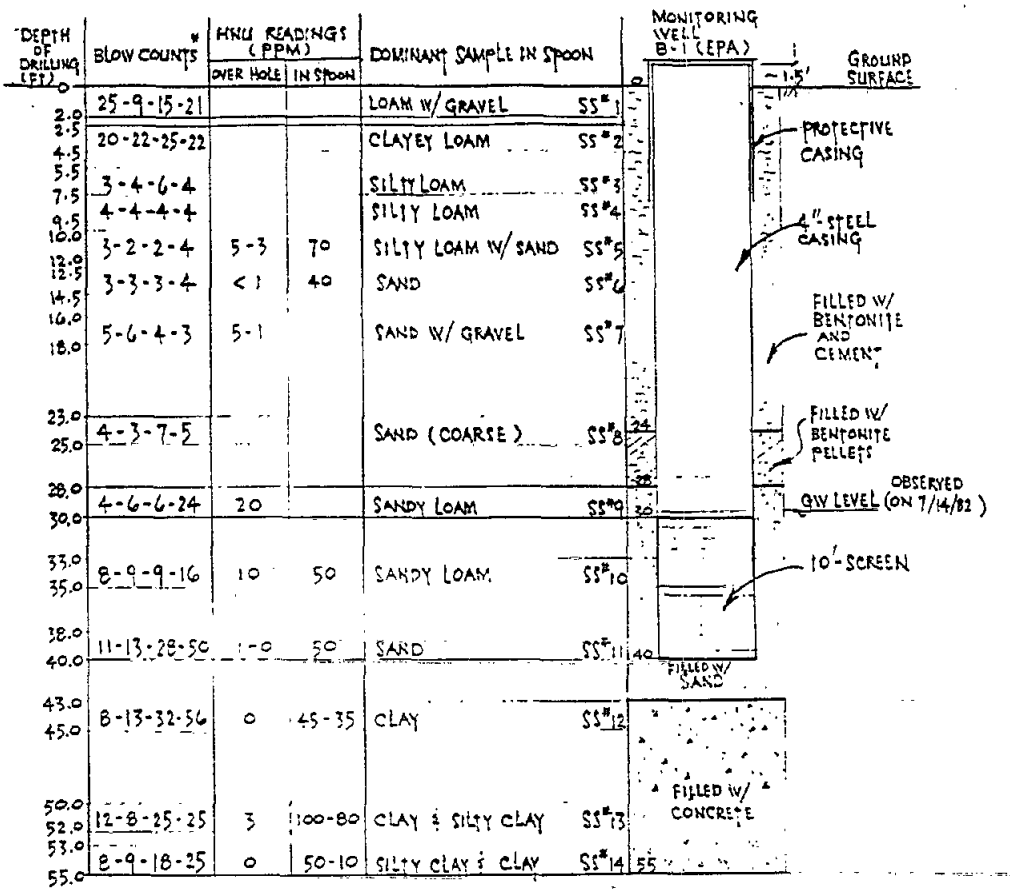
Location	Function	Date of Drilling	Ground * Surface Elevation (approx.) (ft., MSL)	Depth of Drilling (ft.)	CASING					GROUNDWATER LEVEL OBSERVED ON JULY 4, 1982		Remarks
					Inside Diameter (ins.)	Material	Screen Depth (ft.)	Height Above Ground Surface (ft.)	Top of Casing Elevation (ft.,MSL)	Depth Below Top of Casing (ft.)	Ft., MSL	
B-1 (EPA)	Monitoring Well	07/09/82 - 07/14/82	approx. +14.0	55	4	Steel	30-40 (Columbia Formation)	1.5	+15.5	29.7	-14.2	strong smell
B-2 (EPA)	Boring Hole	07/12/82	approx. +14.0	20	-	-	-	-	-	-	-	strong smell
B-3 (EPA)	Boring Hole	07/13/82 - 07/14/82	0	33	-	-	-	-	-	-	-	
B-4 (EPA)	Monitoring Well	07/06/82 - 07/09/82	+24.8	102.5	4	Steel	85-95 (Potomac Formation)	2.7	+27.5	51.0	-23.5	smell
B-5 (EPA)	Monitoring Well	06/28/82 - 07/01/82	+13.3	150	4	Steel	110-120 (Potomac Formation)	2.2	+15.5	29.8	-14.3	
#39	Monitoring Well	Existing	+6.4	132	4	PVC	78-118 (Potomac Formation)	2.0	+8.4	29.9	-21.5	
#45	Monitoring Well	Existing	+24.1	156	4	PVC	100-115 135-145 (Potomac Formation)	1.1	+25.2	45.7	-20.5	

*Ground surface elevations are estimated from the record of nearby wells.



DRILLER : A. C. SCHULTES & SONS, INC.
DATE STARTED : JULY 9, 1982
COMPLETED : JULY 14, 1982
METHOD OF ADVANCING BORING : AUGER
DEPTH OF WELL : 40 FEET
DEPTH OF GROUNDWATER BELOW TOP OF CASING : 29.6 FT.

* SAMPLE HAMMER : WT. 140 LB., DROP 30 INS.

FIGURE 4

SUBSURFACE EXPLORATION
OF MONITORING WELL B-1

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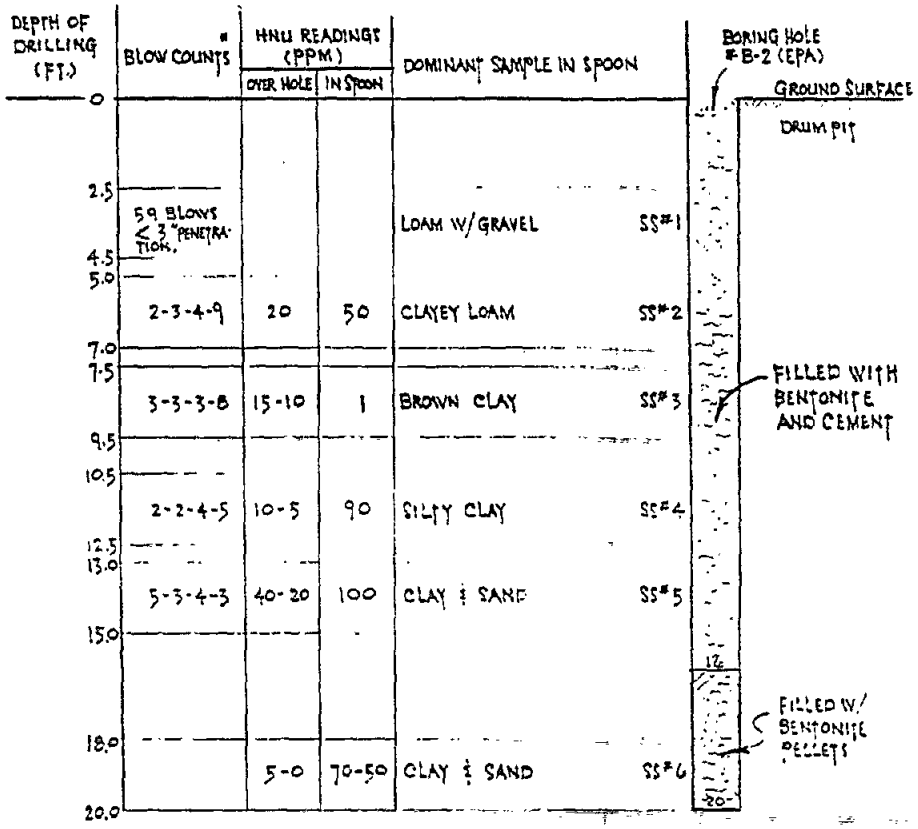


DRILLER : A.C. SCHULTES & SONS, INC.

DATE STARTED : JULY 10, 1982
COMPLETED : JULY 10, 1982

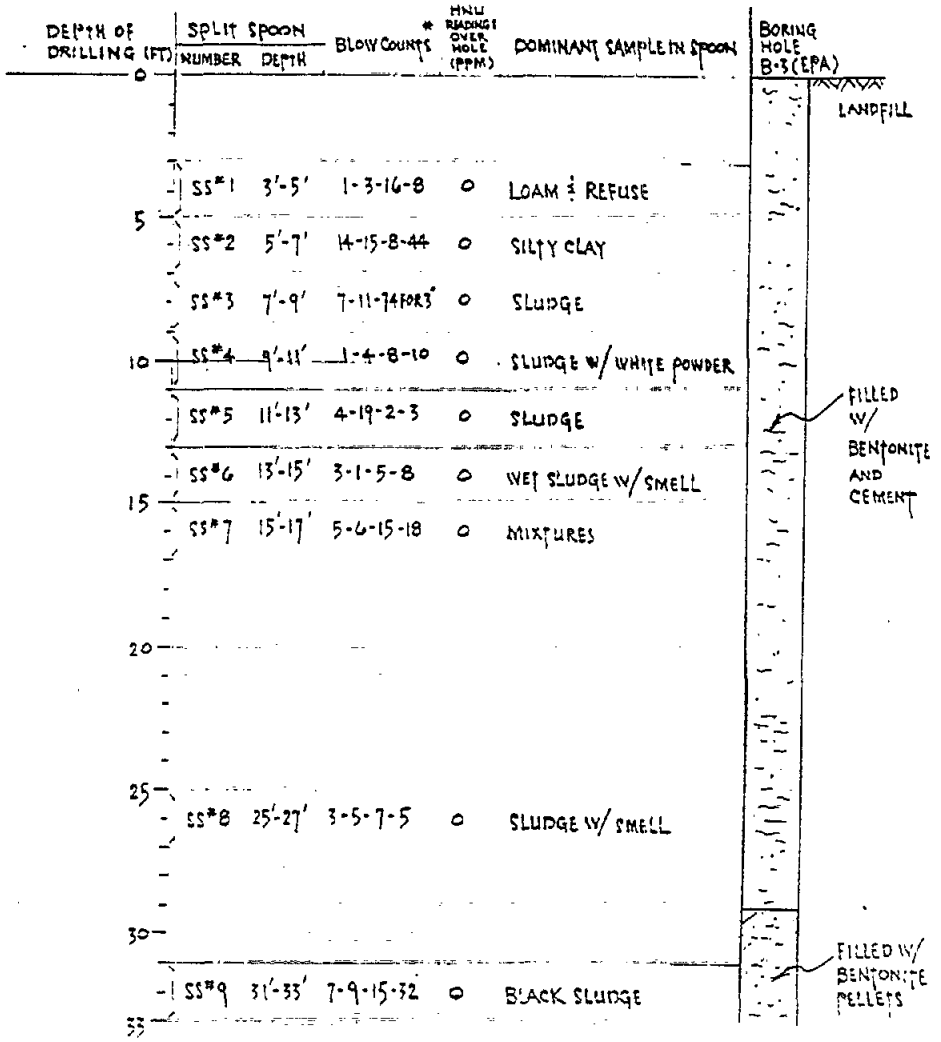
METHOD OF ADVANCING BORING : AUGER

* SAMPLE HAMMER : WT. 140 LB, DROP 30 INS.

FIGURE 5

SUBSURFACE EXPLORATION OF BOREHOLE B-2

F3-8202-04C (DE-17)



DRILLER : A.C. SCHULTES & SONS INC.

DATE STARTED : JULY 13, 1982

COMPLETED : JULY 14, 1982

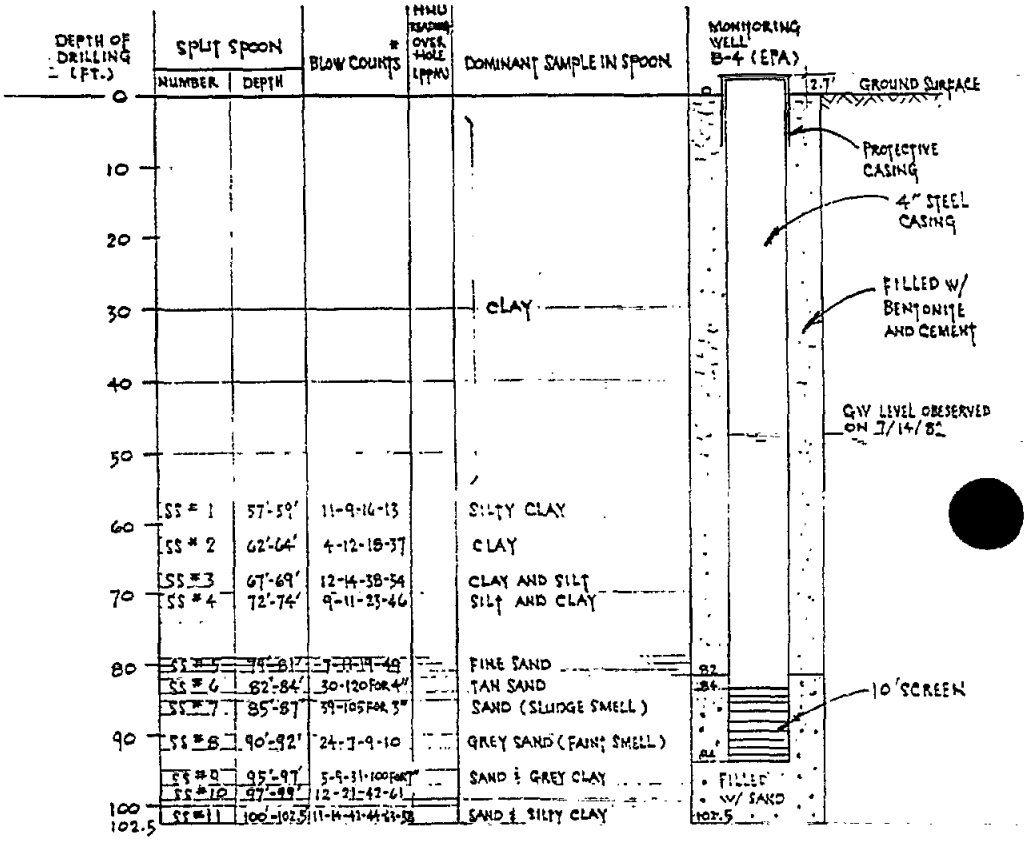
METHOD OF ADVANCING BORING : AUGER

* SAMPLE HAMMER : WT. 140 LBS, DROP 30 INS.

FIGURE 6

SUBSURFACE EXPLORATION OF BOREHOLE B-3

F3-8202-04C (DE-17)



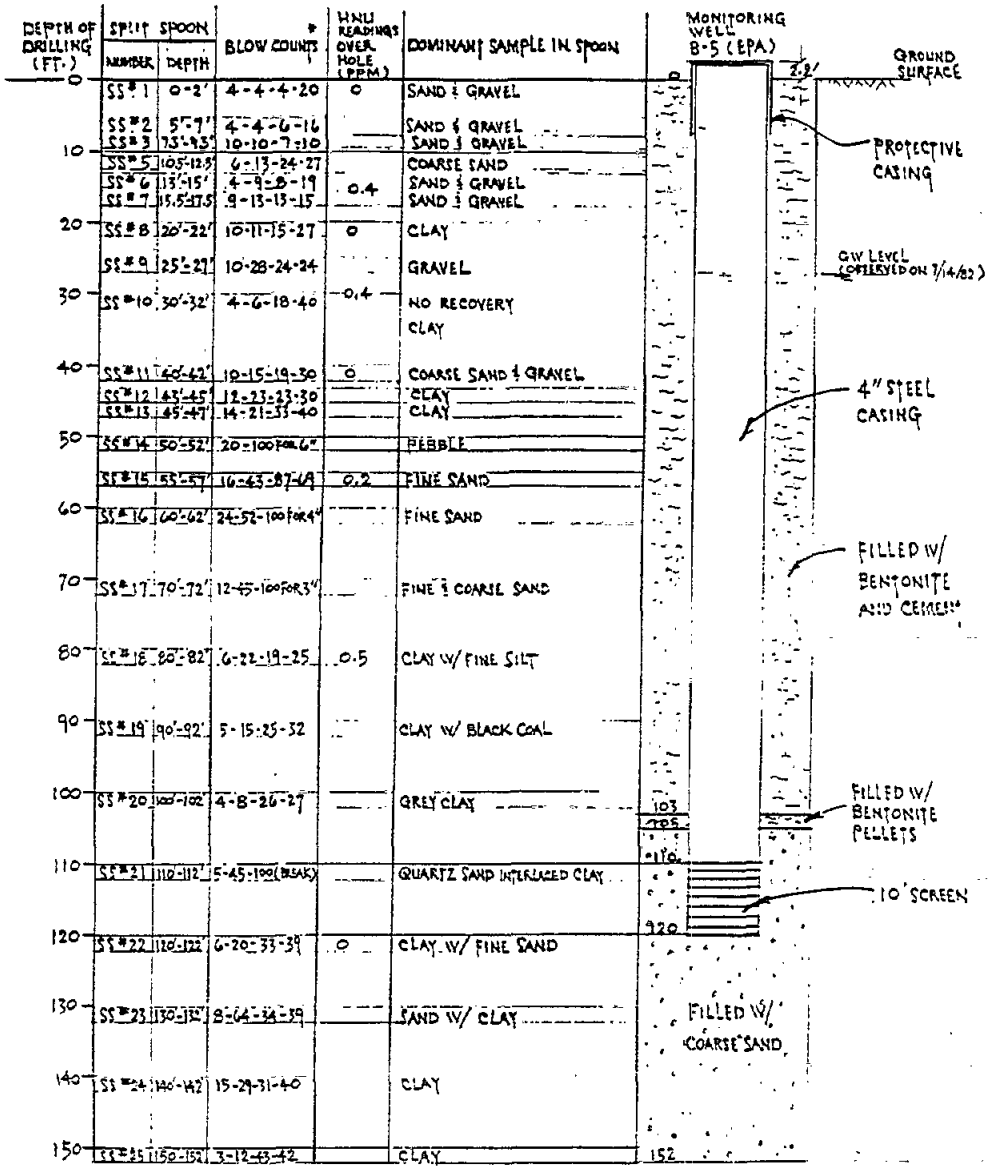
DRILLER : A.C. SCHULTES & SONS INC.
DATES STARTED : JULY 6, 1982
COMPLETED : JULY 9, 1982
METHOD OF ADVANCING BORING : AUGER
DEPTH OF WELL : 94 FT.
DEPTH OF GW BELOW TOP OF CASING : 51 FT.

* SAMPLE HAMMER : WT 140 LBS, DROP 30 INS.

FIGURE 7

SUBSURFACE EXPLORATION OF MONITORING WELL B-4

F3-8202-04C (DE-17)



DRILLER : A.C. SCHULTES & SONS INC.
DATED STARTED : JUNE 28, 1982
COMPLETED : JULY 1, 1982
METHOD OF ADVANCING BORING : ROTARY BIT

DEPTH OF WELL : 120 Ft.
DEPTH OF GROUNDWATER BELOW TOP OF CASING : 29.8 FT.

* SAMPLE HAMMER : WT 140 LBS, DROP 30 INS.

FIGURE 8

SUBSURFACE EXPLORATION OF MONITORING WELL B-5

F3-8202-04C (DE-17)

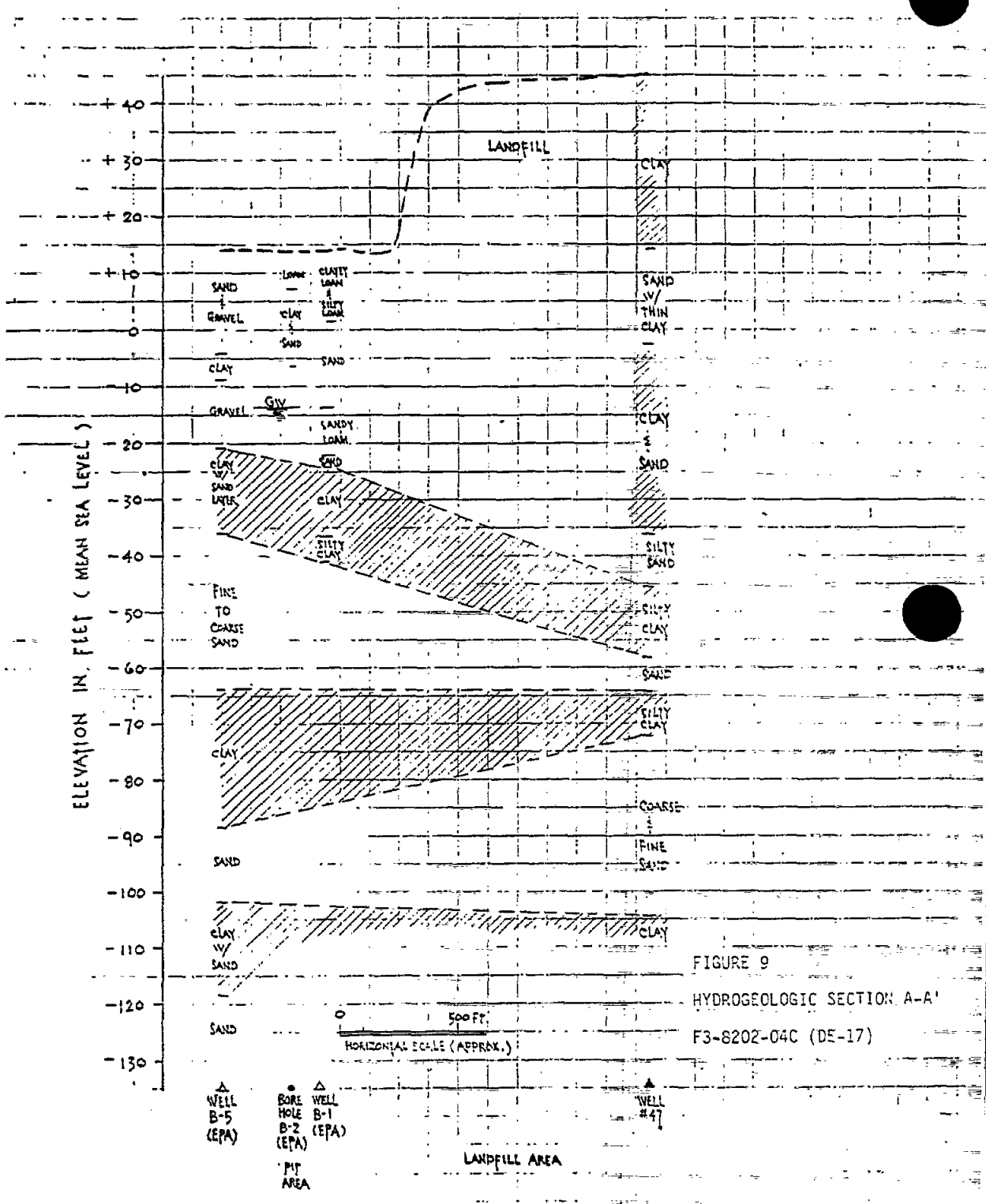


FIGURE 9

HYDROGEOLOGIC SECTION A-A'

F3-8202-04C (DE-17)

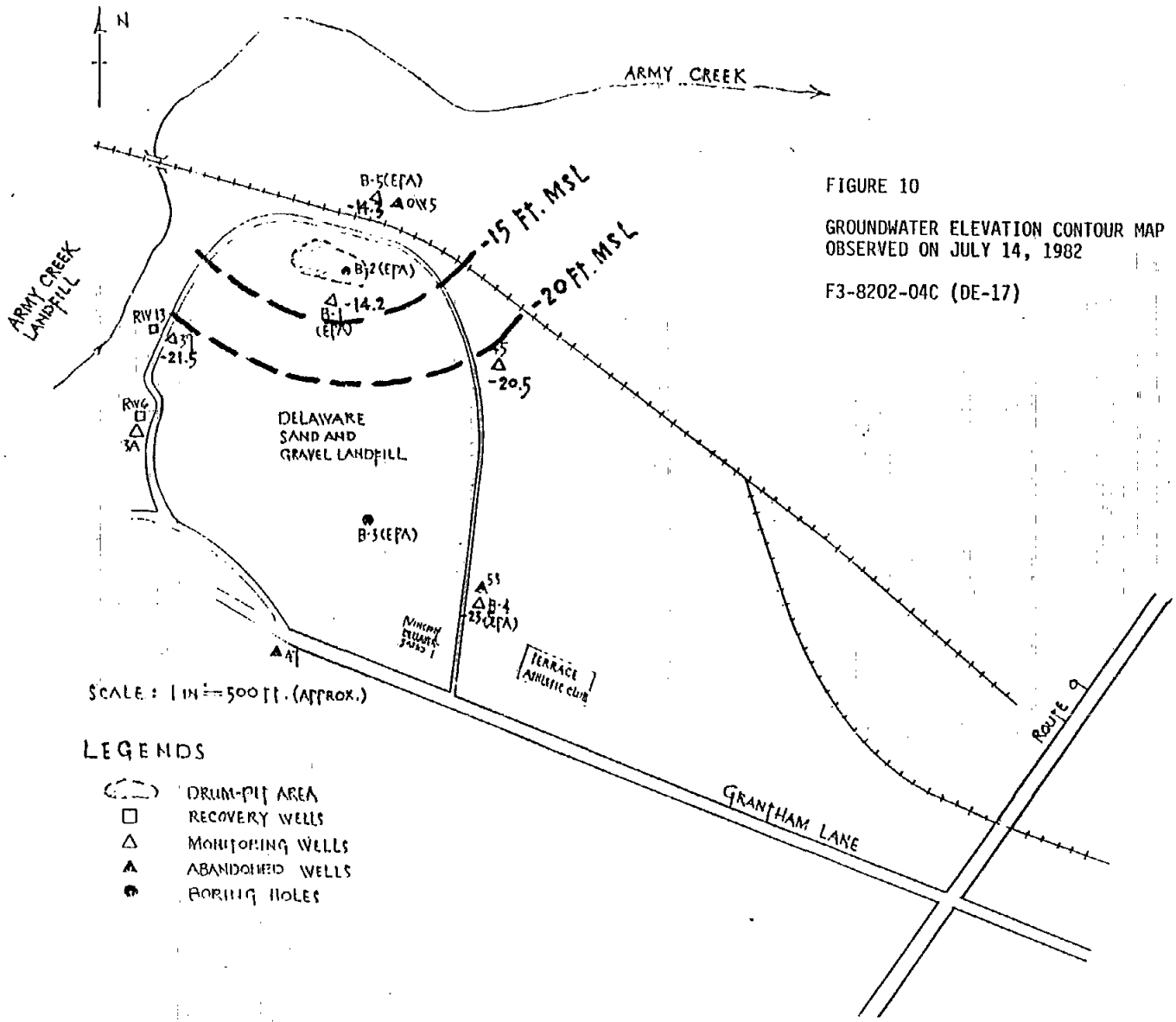


FIGURE 10

GROUNDWATER ELEVATION CONTOUR MAP
OBSERVED ON JULY 14, 1982

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2.6 SOIL AND WATER SAMPLING

The sample locations are designated on Figure 1.

The soil (cutting) sampling from the split spoon sampler was performed by Ecology and Environment, Inc. field personnel. The procedure for decontaminating samplers consisted of: 1) brushing the sampler in water after emptying the cuttings, 2) cleaning the sampler with drinking quality water, 3) rinsing the sampler with acetone, and 4) jetting distilled water for final rinse.

A total of tweleve soil drilling (See Table 2) samples were submitted to labs for analysis.

Drilling Hole	No. of Split Spoon	Depth Below Ground (ft.)
B-1	SS #5	10 - 12.5
	SS #11	38 - 40
B-2	SS #2	5 - 7
	SS #4	10.5 - 12.5
	SS #5	13 - 15
	SS #6	18 - 20
B-3	SS #6	13 - 15
	SS #8	25 - 27
B-4	SS #3	67 - 69
	SS #6 and #7	82 - 87
B-5	SS #12	43 - 45
Stained Soil Area Near Entrance to Landfill	-	0.5

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Five groundwater samples were obtained on July 14, 1982. A "fast turn-around" time of 14 days was arranged for analyses of:

Inorganic Pollutants At:

Versar, Inc.
6621 Electronic Drive
Springfield, VA 22151

Organic Pollutants At:

Mead Technology
5 Triangle Drive
Research Triangle Park
North Carolina 27709

TABLE 2 - SAMPLE LOG
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Well Drilling at Delaware Sand and Gravel Landfill
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Location of Sampling		Traffic Report No.	Sample Description	SAMPLED		ITEMS FOR ANALYSIS		
				Date	Time	Organics	Inorganic	Cyanide
Monitoring Well #B-1	B-1, SS #5 (10-12.5 ft. below ground)	C-1525	Drilling and cutting	07/09/82	1255	X		
		MC-9088					X	X
	B-1, SS #11 (38-40 ft.)	C-1526	Drilling and cutting	07/12/82	0920	X		
		MC-9089					X	X
	B-1, GW	C-1622	Water	07/14/82	1000	X		
		MC-9114					X	X
Borehole #B-2	B-2, SS #2 (5-7 ft.)	C-1612	Boring and cutting	07/12/82	1330	X		
		MC-9090					X	X
	B-2, SS #4 (10.5 - 12.5 ft.)	C-1613	Boring and cutting	07/12/82	1345	X		
		MC-9091					X	X
	B-2, SS #5 (13-15 ft.)	C-1614	Boring and cutting	07/12/82	1350	X		
		MC-9092					X	X
	B-2, SS #6 (18-20 ft.)	C-1615	Boring and cutting	07/12/82	1400	X		
		MC-9093					X	X

TABLE 2 - SAMPLE LOG
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Location of Sampling		Traffic Report No.	Sample Description	SAMPLED		ITEMS FOR ANALYSIS		
				Date	Time	Organics	Inorganic	Cyanide
Borehole #B-3	B-3, SS #6 (13-15 ft.)	C-1617 MC-9094	Boring and cutting	07/13/82	1600	X	X	X
	B-3, SS #8 (25-27 ft.)	C-1616 MC-9095	Boring and cutting	07/13/82	1655	X	X	X
Landfill	Stained area near entrance Depth 1/2 ft. below ground	C-1620 MC-9112	Solid	07/14/82	1030	X	X	X
Monitoring Well #B-4	B-4, SS #3 (67-69 ft.)	C-1523 MC-9086	Drilling and cutting	07/06/82	1520	X	X	X
	B-4, SS #6 and #7 (82-87 ft.)	C-1524 MC-9087	Drilling and cutting	07/07/82	1030	X	X	X
	B-4 GW	C-1624 MC-9118	Water	07/14/82	1030	X	X	X
Monitoring Well #B-5	B-5, SS #12 (43-45 ft.)	C-202-C-2 MC-202-C-1	Drilling and cutting	06/29/82	1715	X	X	X
	B-5 GW	C-1618 MC-9111	Water	07/14/82	0950	X	X	X

TABLE 2 - SAMPLE LOG
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Well Drilling at Delaware Sand and Gravel Landfill
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Location of Sampling	Traffic Report No.	Sample Description	SAMPLED		ITEMS FOR ANALYSIS		
			Date	Time	Organics	Inorganic	Cyanide
Well #39	C-1621 MC-9113	Water	07/14/82	0915	X	X	X
Well #45	C-1623 MC-9117	Water	07/14/82	0930	X	X	X
Blanks	C-202-C-3 MC-202-C-4	Water	07/01/82	-	X	X	X
	C-1625 MC-9191	Water	07/14/82	-	X	X	X

SECTION 3

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION: III | SITE NUMBER (to be assigned by HQ):

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition *(Section II)*. File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET (or other identifier)		
Delaware Sand and Gravel Landfill	229 Grantham Lane		
C. CITY	**D. STATE**	**E. ZIP CODE**	**F. COUNTY NAME**
New Castle	DE	19720	New Castle

G. SITE OPERATOR INFORMATION

1. NAME		2. TELEPHONE NUMBER	
Vincent DellAversano		302-328-3491	
3. STREET	**4. CITY**	**5. STATE**	**6. ZIP CODE**
229 Grantham Lane	New Castle	DE	19720

H. REALTY OWNER INFORMATION *(if different from operator of site)*

1. NAME		2. TELEPHONE NUMBER	
3. CITY		**4. STATE**	**5. ZIP CODE**

I. SITE DESCRIPTION

J. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION *(complete this section last)*

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.)	B. APPARENT SERIOUSNESS OF PROBLEM
August 25, 1982	☐ 1. HIGH ☒ 2. MEDIUM ☐ 3. LOW ☐ 4. NONE

C. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE (mo., day, & yr.)
C. K. Lee	609-665-1515	August 18, 1982

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME	2. TITLE	
C. K. Lee	Hydrologist	
3. ORGANIZATION		**4. TELEPHONE NO. (area code & no.)**
Ecology and Environment, Inc., FIT Region III		609-665-1515

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Frank Quirus, Loren Lasky Doug Taylor, Bill Wentworth, David Nickerson, Jim Vogel, and Terrence Shannon	Ecology and Environment, Inc.	609-665-1515

C. SITE REPRESENTATIVES INTERVIEWED *(corporate officials, workers, residents)*

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
Vincent DellAversano visited the operation of B-4 on the morning of July 6, 1982	Owner of Delaware Sand and Gravel Landfill, 302-328-3491	229 Grantham Lane, New Castle DE 19720

Continued From Front

III. INSPECTION INFORMATION (continued)

D. GENERATOR INFORMATION (sources of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
no record			

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
no record			

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS
not applicable		

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
June 28-July 14 '82	13 days	☒ 1. PERMISSION ☐ 2. WARRANT

J. WEATHER (describe) Sunny, hot, humid and occasionally thunderstorms. Air temperature ranged from 85° to 95°.

IV. SAMPLING INFORMATION

Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER	X	Versar, Inc. and Mead Technology	turn around time 14 days
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER (specify) drilling and cutting	X	Versar, Inc. and Mead Technology	

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS
Explosimeter	Monitored when started drilling.	No readings.
NU	Monitored continuously during drilling operations.	No readings above background were detected in ambient air.
Unimag II Magnetometer	Drum-pit area and refuse area.	Higher readings on some parts of the drum-pit area.

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL
2. PHOTOS IN CUSTODY OF: Ecology and Environment, Inc.

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: USGS Quadrangle

E. COORDINATES

1. LATITUDE (deg.-min.-sec.): 39° 39' 11" N
2. LONGITUDE (deg.-min.-sec.): 75° 36' 05" W

V. SITE INFORMATION

A. SITE STATUS

[ ] 1. ACTIVE (These industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)
[X] 2. INACTIVE (These sites which no longer receive wastes.)
[ ] 3. OTHER (specify): _____ (These sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

[X] 1. NO [ ] 2. YES (specify generator's four-digit SIC Code): _____

C. AREA OF SITE (in acres)

about 10 acres

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [X] 2. YES (specify): Owner's garage

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		waste pit

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [X] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL
[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [X] 2. SOLID [X] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [X] 4. HIGHLY VOLATILE
[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [X] 8. FLAMMABLE
[ ] 9. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

records of wastes are not available

Continued From Front

TDD No. F3-8202-04C

EPA No. DE-17

VII. WASTE RELATED INFORMATION (continued)

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT: about 375,000 gallons of industrial liquid	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
X (1) PAINT, PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SML TG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	(6) OTHER (specify):	
			X (7) PHENOLS		
			X (8) HALOGENS		
			X (9) PCB		
			(10) METALS		
			X (11) OTHER (specify): aromatics		

C. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
1,2-dichloroethane		X			X			107-06-02	1,500	ug/l
trichloroethylene		X			X			79-01-6	27	ug/l
PCB		X			X			11097-69-1	262	ug/g
benzene		X		X				71-43-2	180	ug/l
toluene		X			X			108-88-3	1,200	ug/l
lead	X							7439-92-1	120	ug/l
phenol	X							108-95-2	360	ug/l

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

[Y] A. HUMAN HEALTH HAZARDS

	1,2 Dichloroethane	Trichloroethylene	Benzene	Methylene Chloride	Phenol	Di-N-Butyl-phthalate
TSCA Cancer	X	X	X			
Experienced Carcinogen				X	X	
Experienced Mutagen	X					
Experienced Teratogen	X					X

Continue On Page 5

Continued From Page 4

VIII. HAZARD DESCRIPTION (continued)

B. NON-WORKER INJURY/EXPOSURE

not reported

C. WORKER INJURY/EXPOSURE

not known

☒ D. CONTAMINATION OF WATER SUPPLY

Amoco wells shut down in 1975, due to contamination.

E. CONTAMINATION OF FOOD CHAIN

not reported

☒ F. CONTAMINATION OF GROUND WATER

1,2 Dichloroethane, trichloroethylene, benzene and other priority pollutants (see Table 3) were found in ground water sampling on July 14, 1982.

Amoco wells shut down due to contamination.

G. CONTAMINATION OF SURFACE WATER

none observed

Continued From Front

VIII. HAZARD DESCRIPTION (continued)

H. DAMAGE TO FLORA/FAUNA

Parts of the drum-pit area and the landfill area are without vegetative cover.

I. FISH KILL

none reported

J. CONTAMINATION OF AIR

none observed but strong chemical odors were detected during drilling at the drum-pit area.

K. NOTICEABLE ODORS

Unidentifiable odor observed during drilling phase of B-1, B-2, B-3 and B-4 but no readings above background detected by HNU.

L. CONTAMINATION OF SOIL

PCB, phenol, aromatics and other priority pollutants were found in the soil samples of drilling at the drum-pit area.

M. PROPERTY DAMAGE

none observed

VIII. HAZARD DESCRIPTION (continued)

☒ N. FIRE OR EXPLOSION

Fires occurred in 1969.

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

not observed

☐ P. SEWER, STORM DRAIN PROBLEMS

not observed

☐ Q. EROSION PROBLEMS

not observed

☒ R. INADEQUATE SECURITY

No security fence and site is easily accessed.

☐ S. INCOMPATIBLE WASTES

unknown

VIII. HAZARD DESCRIPTION (continued)

☐ T. MIDNIGHT DUMPING

not known

☐ U. OTHER (specify):

not applicable

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	about 100,000 people served by Artesian Water Company			
2. IN COMMERCIAL OR INDUSTRIAL AREAS	about 100,000 people served by Artesian Water Company			
3. IN PUBLICLY TRAVELLED AREAS	near Grantham Lane, Route 9 & R.R.	truck varies	-	50-1,000 ft.
4. PUBLIC USE AREAS (parks, schools, etc.)	no			

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
varies 25-50 ft.	southeasterly	Artesian Water Company
D. POTENTIAL YIELD OF AQUIFER	E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure)	F. DIRECTION TO DRINKING WATER SUPPLY
	about 4,000 ft.	southeasterly

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY < 15 CONNECTIONS* ☒ 2. COMMUNITY (specify town): New Castle > 15 CONNECTIONS

☐ 3. SURFACE WATER ☒ 4. WELL

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

A. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')
Amoco wells	about 150 ft.	Route 9 - it shut down due to contamination	X
Gonzon	145 ft.	Grantham Lane	X
V. DellAversano	135 ft.	Grantham Lane	X

B. RECEIVING WATER

1. NAME: Delaware River and Army Creek

☐ 2. SEWERS ☒ 3. STREAMS/RIVERS ☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER (specify):

C. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

This reach of Delaware River is classified as interstate stream zone 5.

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☐ C. 100 YEAR FLOOD PLAIN ☒ D. WETLAND

☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE A

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

A. OVERBURDEN		B. BEDROCK (specify below)		C. OTHER (specify below)
1. SAND	X	Solid rock below Potomac Formation.		
X 2. CLAY (Loam)				
3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☒ C. HIGH (1000 to 10 cm/sec.)

☐ D. MODERATE (10 to .1 cm/sec.) ☐ E. LOW (.1 to .001 cm/sec.) ☐ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☒ 1. YES ☐ 2. NO 3. COMMENTS: by infiltration to recharge groundwater

H. DISCHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS: groundwater

I. SLOPE

1. ESTIMATE % OF SLOPE: less than 3%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.: Generally to south, but the ground surface was changed due to pit and landfill.

J. OTHER GEOLOGICAL DATA

The site is underlain by the Columbia Formation, ranging from 30 to 60 feet in thickness. The underlying Potomac Formation consits of stream-deposited sand and interbedded clay and silt.

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, yr.)	E. EXPIRATION DATE (mo., day, yr.)	F. IN COMPLIANCE (mark 'X') 1. YES	2. NO	3. UNKNOWN
State Permit	DN REC	-	1969	1976			

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☐ NONE ☒ YES (summarize in this space)

Closed by State Court action in December 1979.

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition (*Section II*) information on the first page of this form.

TDD No. F3-8202-04C EPA No. DE-17

LANDFILLS SITE INSPECTION REPORT
(Supplemental Report)

INSTRUCTION
Answer and Explain as necessary.

1. EVIDENCE OF SITE INSTABILITY (Erosion, Settling, Sink Holes, etc)
☒ YES ☐ NO Sink holes were observed in pit-drum area.

2. EVIDENCE OF IMPROPER DISPOSAL OF BULK LIQUIDS, SEMI-SOLIDS AND SLUDGES INTO THE LANDFILL
☒ YES ☐ NO

3. CHECK RECORDS OF CELL LOCATION AND CONTENTS AND BENCHMARK
☐ YES ☒ NO

4. WASTES SURROUNDED BY SORBENT MATERIAL
☐ YES ☒ NO

5. DIVERSION STRUCTURES ARE EFFECTIVELY CONSTRUCTED AND PROPERLY MAINTAINED
☐ YES ☒ NO

6. EVIDENCE OF PONDING OF WATER ON SITE
☐ YES ☒ NO

7. EVIDENCE OF IMPROPER/INADEQUATE DRAINING
☒ YES ☐ NO No drainage system.

8. ADEQUATE LEACHATE COLLECTION SYSTEM (If "Yes", specify Type)
☐ YES ☒ NO No leachate collection system.

8a. SURFACE LEACHATE SPRING
☐ YES ☒ NO

9. RECORDS OF LEACHATE ANALYSIS
☐ YES ☒ NO

10. GAS MONITORING
☒ YES ☐ NO

11. GROUNDWATER MONITORING WELLS
☒ YES ☐ NO

12. ARTIFICIAL MEMBRANE LINER INSTALLED
☐ YES ☒ NO

13. SPECIFIC CONTAINMENT MEASURES (Clay Bottom, Sides, etc)
☐ YES ☒ NO

14. FIXATION (Stabilization) OF WASTE
☐ YES ☒ NO

15. ADEQUATE CLOSURE OF INACTIVE PORTION OF FACILITY
☐ YES ☒ NO

16. COVER (Type)

Clayey loam.

16a. THICKNESS

Varies and unknown.

16b. PERMEABILITY

Estimated permeability 50-75 ft./day of fine to coarse sand in Columbia Formation.

16c. DAILY APPLICATION
☐ YES ☒ NO

EPA Form T2070-3E (10-79)

AR100108

SECTION 4

F3-8203-[illegible]

TABLE 3 (PAGE 1/2) SUMMARY OF ORGANIC ANALYSES OF GROUNDWATER SAMPLES (I) conc. µg/L

PRIORITY POLLUTANTS ORGANICS		MAXIMUM VALUES FOR PROTECTION OF: DRINKABLE WATER SUPPLIES (WATER & FISH)	DRINKABLE WATER SUPPLIES (TOXICITY)	FRESHWATER AQUATIC LIFE	SAMPLING ON JULY 14, 1982: B-1 EPA WELL	B-4 EPA WELL	B-5 EPA WELL	WELL #31	WELL #45
HALOGENATED METHANES C1	BROMODICHLOROMETHANE	—	—	11,000					
	BROMOFORM (TRIBROMOMETHANE)			11,000					
	BROMOMETHANE	—	—	11,000					
	CARBON TETRACHLORIDE	0.40	—	35,200					
	CHLOROFORM	0.19	—	28,900					
	DIBROMOCHLOROMETHANE	—	—	11,000					
	DICHLORODIFLUOROMETHANE *	—	—	11,000					
	METHYL CHLORIDE (CHLOROMETHANE)	—	—	11,000					
	METHYLENE CHLORIDE (DICHLOROMETHANE)	—	—	11,000	4,000				
	TRICHLOROFLUOROMETHANE *	—	—	11,000	<10				
CHLORINATED C2	CHLOROETHANE	—	—	—					
	1,1-DICHLOROETHANE	—	—	—					
	1,2-DICHLOROETHANE	0.94	—	20,000	1,500				
	1,1-DICHLOROETHYLENE	0.033	—	11,600					
	1,2-TRANS-DICHLOROETHYLENE	—	—	11,600					
	HEXACHLOROETHANE	1.9	—	540					
	1,1,2,2-TETRACHLOROETHANE	0.17	—	2,400					
	TETRACHLOROETHYLENE	0.8	—	840					
	1,1,1-TRICHLOROETHANE	—	18.4 MG/L	18,000					
	1,1,2-TRICHLOROETHANE	0.6	—	9,400					
	TRICHLOROETHYLENE	2.7	—	45,000	27				
	VINYL CHLORIDE	—	—	47					
HALOGENATED C3	1,2-DICHLOROPROPANE	—	—	5,700					
	1,3-DICHLOROPROPYLENE	—	87	244					
C4	HEXACHLOROBUTADIENE	0.45	—	9.3					
C5	HEXACHLOROCYCLOPENTADIENE	—	206	5.2					
CHLORINATED ETHERS	BIS(2-CHLOROETHOXY) METHANE								
	BIS(2-CHLOROETHYL) ETHER	0.03	—						
	BIS(2-CHLOROISOPROPYL) ETHER	—	34.7	238,000					
	BIS(CHLOROMETHYL) ETHER *	0.0001 ng/L	—						
	2-CHLOROETHYL VINYL ETHER								
PHENOXY CHLORINATED	4-BROMOPHENYL PHENYL ETHER								
	4-CHLOROPHENYL PHENYL ETHER								
PHTHALATE ESTERS	BIS(2-ETHYLHEXYL) PHTHALATE								13
	BUTYL BENZYL PHTHALATE								
	DIETHYL PHTHALATE	—	350 MG/L	—					
	DIMETHYL PHTHALATE	—	1313 MG/L	—					
	DI-N-BUTYL PHTHALATE	—	34 MG/L	—		14	18		
	DI-N-OCTYL PHTHALATE								
NITROGEN COMPOUNDS	BENZIDINE	0.12 ng/L	—	2,500					
	3,3'-DICHLOROBENZIDINE	0.0103	—	—					
	1,2-DIPHENYLHYDRAZINE	42 ng/L	—	270					
	N-NITROSODIMETHYL AMINE	1.4 ng/L	—	—					
	N-NITROSODIPHENYL AMINE	4.9	—	—					
	N-NITROSODI-N-PROPYL AMINE								
MISC.	ACROLEIN	—	330	21					
	ACRYLONITRILE	0.058	—	7,550					
	ISOPHORONE	—	5.2 MG/L	117,000					
	POLYCHLORINATED BIPHENYLS (PCB'S)	0.079 ng/L	—	0.014					

AR100110

TABLE 3 (PAGE 1/2) SUMMARY OF ORGANIC ANALYSES OF GROUNDWATER SAM

	PRIORITY POLLUTANTS ORGANICS	MAXIMUM VALUES FOR PROTECTION OF: FRESH WATER AQUATIC LIFE: 96 HOUR RISK	TOXICITY	FRESH WATER AQUATIC LIFE	SAMPLING ON JULY 14, 1982: B-1 EPA WELL	B-4 EPA WELL	B-5 EPA WELL	WELL #3	WELL #6
AROMATICS	BENZENE	0.66	—	5,300	180	57			
	ETHYLBENZENE	—	1.4 MG/L	32,000	16	18			
	TOLUENE	—	14.3 MG/L	17,500	1,200	880			
POLYAROMATICS	ACENAPHTHENE			1,700					
	ACENAPHTHYLENE								
	ANTHRACENE								
	BENZO(a)ANTHRACENE								
	BENZO(b)FLUORANTHENE	PAHS 0.8 PG/L	—	—					
	BENZO(K)FLUORANTHENE								
	BENZO(ghi)PERYLENE								
	BENZO(a)PYRENE								
	CHRYSENE								
	DIBENZO(a,h)ANTHRACENE								
	FLUORANTHENE	—	42	3,980					
	FLUORENE	PAHS							
	INDENO(1,2,3-cd)PYRENE								
	NAPHTHALENE	—	—	620					
	PHENANTHRENE	PAHS							
	PYRENE								
CHLORINATED HCs	CHLOROBENZENE	—	488	250	10				
	o-DICHLOROBENZENE	—							
	p-DICHLOROBENZENE								
	m-DICHLOROBENZENE		400	763					
	HEXACHLOROBENZENE	1.72 NG/L	—	250					
	1,2,4-TRICHLOROBENZENE	—	—	250					
NON AMINE AROMATICS	2,4-DINITROTOLUENE	0.11	—	330					
	2,6-DINITROTOLUENE								
	NITROBENZENE	—	19.8 MG/L	27,000					
	α-CHLORONAPHTHALENE	—	—	1,600					
PHENOLS	PHENOL	—	3.5 MG/L	2,560	360				
	2,4-DIMETHYLPHENOL	—	—	2,120					
CHLORINATED PHENOLS	4-CHLORO-m-CRESOL	—	13.4						
	2-CHLOROPHENOL	—	—	4,380					
	2,4-DICHLOROPHENOL	—	13.09 MG/L	365					
	PENTACHLOROPHENOL	—	11.01 MG/L	3.2					
	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN								
	2,4,6-TRICHLOROPHENOL	1.2	—	970					
NITROPHENOLS	4,6-DINITRO-O-CRESOL	—	13.4	330					
	2,4-DINITROPHENOL	—	70	330					
	2-NITROPHENOL				<10				
	4-NITROPHENOL			330					

ALL UNITS ARE IN µG/L (PPb) EXCEPT NOTED

MAX. VALUES FOR PROTECTION ARE ABSTRACTED FROM FEDERAL REGISTER, NOV. 28, 1980, EPA WATER QUALITY C

* EPA HAS DELETED ON NOVEMBER, 1981

TABLE 4 (PAGE 1/2) SUMMARY OF ORGANIC ANALYSES OF CUTTING (SOIL) SAMPLES (I)

Group	Priority Pollutants Organics	Limiting values for protection of human health: Carcinogenicity	Toxicity	Freshwater acute life	B-1 SS#5	B-1 SS#11	B-2 SS#2	B-2 SS#4	B-2 SS#5	B-2 SS#6	B-3 SS#6	B-3 SS#8	B-4 SS#3	B-4 SS#17	B-5 SS#12	B-5 (blind sample)
Halogenated methanes C1	Bromodichloromethane	—	—	11,000												
	Bromoform (tribromomethane)			11,000												
	Bromomethane	—	—	11,000												
	Carbon tetrachloride	0.40	—	35,200												
	Chloroform	0.19	—	28,900				0.019								
	Dibromochloromethane	—	—	11,000												
	Dichlorodifluoromethane *	—	—	11,000												
	Methyl chloride (chloromethane)	—	—	11,000												
	Methylene chloride (dichloromethane)	—	—	11,000		14.16	5.3	10	2.72				1.014	0.021	0.019	0.097
	Trichlorofluoromethane*	—	—	11,000												LT
Chlorinated C2	Chloroethane	—	—	—												
	1,1-Dichloroethane	—	—	—												
	1,2-Dichloroethane	0.94	—	20,000		10.016		20	0.26						0.012	
	1,1-Dichloroethylene	0.033	—	11,600												
	1,2-Trans-dichloroethylene	—	—	11,600												
	Hexachloroethane	1.9	—	540												
	1,1,2,2-Tetrachloroethane	0.17	—	2,400												
	Tetrachloroethylene	0.8	—	840				LT								
	1,1,1-Trichloroethane	—	18.4 mg/L	18,000												
	1,1,2-Trichloroethane	0.6	—	9,400				0.012								
	Trichloroethylene	2.7	—	45,000				0.026								
	Vinyl chloride	—	—	47												
Chlorinated C3	1,2-Dichloropropane	—	—	5,700												
	1,3-Dichloropropylene	—	87	244												
C4	Hexachlorobutadiene	0.45	—	9.3												
C5	Hexachlorocyclopentadiene	—	206	5.2												
Chloroalkyl ethers	Bis(2-chloroethoxy) methane															
	Bis(2-chloroethyl) ether	0.03	—													
	Bis(2-chloroisopropyl) ether	—	34.7	238,000												
	Bis(chloromethyl) ether *	0.00037 ng/L	—													
	2-Chloroethyl vinyl ether															
Haloaryl ethers	4-Bromophenyl phenyl ether															
	4-Chlorophenyl phenyl ether															
Phthalate esters	Bis(2-ethylhexyl) phthalate						1.38	LT			0.30					
	Butyl benzyl phthalate															
	Diethyl phthalate	—	350 ug/L	—												
	Dimethyl phthalate	—	313 ug/L	—												
	Di-n-butyl phthalate	—	34 ug/L	—		LT	2.2	0.69								
	Di-n-octyl phthalate															
Nitrogen compounds: benzidines	Benzidine	0.12 ng/L	—	2,500												
	3,3'-Dichlorobenzidine	0.0103	—	—												
	1,2-Diphenylhydrazine	42 ng/L	—	270												
Nitrogen compounds: amines	N-Nitrosodimethyl amine	1.4 ng/L	—	—												
	N-Nitrosodiphenyl amine	4.9	—	—												
	N-Nitrosodi-n-propyl amine															
Misc.	Acrolein	—	320	21												
	Acrylonitrile	0.058	—	7,550												
	Isophorone	—	5.2 mg/L	117,000												
	Polychlorinated biphenyls (PCB's)	0.079 ng/L	—	0.014				[illegible]								

FE-[illegible] (IE-17)

TABLE 4 (PAGE 2/2) SUMMARY OF ORGANIC ANALYSES OF CUTTING (SOIL) SAMPLES (II)

	PRIORITY POLLUTANTS ORGANICS	MAXIMUM VALUES FOR PROTECTION: HUMAN HEALTH	MAXIMUM VALUES FOR PROTECTION: TOXICITY	MAXIMUM VALUES FOR PROTECTION: AQUATIC LIFE	SAMPLING ON JUNE 28 THRU JULY 14, 1982 (µg/g): B-1 SS#5	B-1 SS#11	B-2 SS#2	B-2 SS#4	B-2 SS#5	B-2 SS#6	B-3 SS#6	B-3 SS#8	B-4 SS#3	B-4 SS#6	B-5 SS#12	LANDFILL
AROMATICS	BENZENE	0.66	—	5,300			0.11	1.3							LT	
	ETHYLBENZENE	—	1.4 MG/L	32,000			0.077	0.27								0.82
	TOLUENE	—	14.3 MG/L	17,500		0.013	0.58	6	LT	LT		0.01		0.063	0.044	0.044
POLYAROMATICS	ACENAPHTHENE			1,700												
	ACENAPHTHYLENE	PAHS 2.8 NG/L														
	ANTHRACENE															
	BENZO(a)ANTHRACENE															
	BENZO(b)FLUORANTHENE		—	—												
	BENZO(K)FLUORANTHENE															
	BENZO(ghi)PERYLENE															
	BENZO(a)PYRENE															
	CHRYSENE															
	DIBENZO(a,h)ANTHRACENE															
	FLUORANTHENE	—	42	3,980												
	FLUORENE	PAHS														
	INDENO(1,2,3-cd)PYRENE															
	NAPHTHALENE	—	—	620												
	PHENANTHRENE	PAHS														
	PYRENE															
CHLORINATED AROMATICS	CHLOROBENZENE	—	488	250			LT	0.08								
	O-DICHLOROBENZENE															
	P-DICHLOROBENZENE	—														
	m-DICHLOROBENZENE		400	763												
	HEXACHLOROBENZENE	0.72 NG/L	—	250												
	1,2,4-TRICHLOROBENZENE	—	—	250												
NITRO-AROMATICS	2,4-DINITROTOLUENE	0.11	—	230												
	2,6-DINITROTOLUENE															
	NITROBENZENE	—	19.8 MG/L	27,000												
PA	2-CHLORONAPHTHALENE	—	—	1,600												
PHENOLS	PHENOL	—	3.5 MG/L	2,560		1.0	0.99	16	22	14						
	2,4-DIMETHYLPHENOL	—	—	2,120					0.27							
CHLORINATED PHENOLS	4-CHLORO-m-CRESOL	—	13.4													
	2-CHLOROPHENOL	—	—	4,380												
	2,4-DICHLOROPHENOL	—	3.09 MG/L	365												
	PENTACHLOROPHENOL	—	1.01 MG/L	3.2												
	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN															
	2,4,6-TRICHLOROPHENOL	1.2	—	970												
NITROPHENOLS	4,6-DINITRO-O-CRESOL	—	13.4	230												
	2,4-DINITROPHENOL	—	70	230												
	2-NITROPHENOL															
	4-NITROPHENOL			230												

ALL UNITS ARE IN µg/L (ppb) EXCEPT NOTED

MAX. VALUES FOR PROTECTION ARE ABSTRACTED FROM " FEDERAL REGISTER , NOV. 28, 1980 , EPA WATER QUALITY CRITERIA DOCUMENT

* EPA HAS DELETED ON NOVEMBER, 1981

AR100113

TABLE 5 SUMMARY OF INORGANIC ANALYSES OF GROUND WATER SAMPLES

INORGANICS	WATER QUALITY CRITERIA: PERMISSIBLE CRITERIA FOR PUBLIC WATER SUPPLIES	WATER QUALITY CRITERIA: MAX. VALUES FOR PROTECTION OF FRESH WATER AQUATIC LIFE	SAMPLING ON JULY 14, 1982 (µg/L): B-1 (EPA)	B-4 (EPA)	B-5 (EPA)	WELL #39	WELL #45
ANTIMONY	(146*)	1,600	<20	<20	<20	<20	<20
ARSENIC	50 (0.0022)**	440	10	<10	<10	120	<10
BERYLLIUM	(0.0037)**	5.3	<2	<2	<2	<2	<2
CADMIUM	10	0.012	<5	<5	10	10	<5
CHROMIUM	50	0.29	30	<10	10	90	<10
COPPER	1,000	5.6	40	<20	<20	60	<20
LEAD	50	0.75	120	<40	80	320	<40
MERCURY	2 (0.144*)	0.00057	1	<1	<1	<1	<1
NICKEL	(13.4*)	56	20	20	40	60	<20
SELENIUM	10	35	<10	<20	<10	<20	<10
SILVER	50	0.12	<20	<20	<20	<20	<20
THALLIUM	(13*)	40	<10	<10	<10	<10	<10
ZINC	5,000	47	210	120	130	270	60
CYANIDE	FREE CN (200*)	3.5	<10	<10	<10	<10	<10
ASBESTO	(30,000 FIBERS/L)**						
TOTAL PHENOLS							
ALUMINUM		1,000 (IRRIGATION)	15,800	450	1,050	103,000	550
BARIUM	1,000		90	570	60	310	70
BORON	1,000	750 (IRRIGATION)	20	10	<10	<100	10
CALCIUM			37,600	14,000	10,200	15,500	10,600
COBALT		200 (IRRIGATION)	<10	10	<10	20	<10
IRON	300	1,000	55,000	25,700	41,600	191,000	1,560
MAGNESIUM			5,000	5,000	2,300	4,200	3,600
MANGANESE	50	2,000 (IRRIGATION)	450	2,720	480	2,140	140
SODIUM			7,300	11,900	18,000	11,200	6,600
TIN			<20	<20	<20	20	<20
VANADIUM		10,000 (IRRIGATION)	30	<10	<10	170	<10
ALKALINITY							
AMMONIA		20					
CHLORIDE	250,000	3					
NITRATE	AS N 10,000						
PHOSPHORUS							
SULFATE	250,000						
DISSOLVED OXYGEN	≥ 3,000						
TOTAL DISSOLVED SOLIDS	500,000						
BOD							
COD							
TOC							
PH	6.0-8.5	5-9					
CONDUCTIVITY							

NOTES: (1) ALL UNITS IN µg/L, EXCEPT NOTED
(2) * TOXICITY ; ** 10^{-6} CANCER RISK

(3) REF. FEDERAL REGISTER, NOV. 28, 1980
EPA, QUALITY CRITERIA FOR WATER, JULY 1976

TABLE 6 SUMMARY OF INORGANIC ANALYSES OF CUTTING (SOIL) SAMPLES

INORGANICS	WATER QUALITY CRITERIA: PERMISSIBLE CRITERIA FOR PUBLIC WATER SUPPLIES	WATER QUALITY CRITERIA: MAX. VALUES FOR PROTECTION OF FRESH WATER AQUATIC LIFE	SAMPLING ON JUNE 28 THRU JULY 14, 1982 (MG/KG): B-1 SS#5	B-1 SS#11	B-2 SS#2	B-2 SS#4	B-2 SS#5	B-2 SS#6	B-3 SS#6	B-3 SS#8	B-4 SS#3	B-4 SS#6&7	B-5 SS#12	LANDFILL NEAR ENTRANCE
ANTIMONY	(146*)	1,600	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
ARSENIC	50 (0.0022)**	440	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BERYLLIUM	(0.0037)**	5.3	<0.2	0.4	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2
CADMIUM	10	0.012	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CHROMIUM	50	0.29	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1
COPPER	1,000	5.6	<2	<2	<2	2	<2	<2	2	4	<2	<2	4	6
LEAD	50	0.75	<4	<4	<4	<4	<4	<4	<4	4	20	4	<4	20
MERCURY	2 (0.144*)	0.00057	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
NICKEL	(13.4*)	56	<2	4	<2	2	<2	<2	<2	2	<2	<2	<2	<2
SELENIUM	10	35	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
SILVER	50	0.12	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
THALLIUM	(13*)	40	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ZINC	5,000	47	<1	11	2	2	1	2	4	7	<1	3	<1	14
CYANIDE	FREE CN (200*)	3.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ASBESTOS	(30,000 FIBERS/L)**													
TOTAL PHENOLS														
ALUMINUM		1,000 (IRRIGATION)	90	304	90	120	80	110	100	220	25	30	20	100
BARIUM	1,000		10	56	33	42	22	33	33	34	<1	<1	<1	5
BORON	1,000	750 (IRRIGATION)	<1	1	<1	<1	<1	3	8	2	1	2	<1	2
CALCIUM			90	1,220	27	320	260	300	200	460	280	120	150	200
COBALT		200 (IRRIGATION)	<1	12	3	3	3	2	<1	2	<1	<1	<1	<1
IRON	300	1,000	20	70	26	802	114	94	276	1,490	134	690	130	450
MAGNESIUM			50	50	120	160	140	190	141	180	70	40	50	30
MANGANESE	50	2,000 (IRRIGATION)	7	198	<1	264	224	247	90	35	3	15	8	11
SODIUM			<10	90	370	470	330	390	260	160	<10	<10	<10	30
TIN			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
VANADIUM		10,000 (IRRIGATION)	<1	2	2	1	1	2	2	5	2	1	<1	1
ALKALINITY														
AMMONIA		20												
CHLORIDE	250,000	3												
NITRATE	AS N 10,000													
PHOSPHORUS														
SULFATE	250,000													
DISSOLVED OXYGEN	≥ 3,000													
TOTAL DISSOLVED SOLIDS	500,000													
BOD														
COD														
TOC														
PH	6.0–8.5	5–9												
CONDUCTIVITY														
	MG/KG = 10 μG/G													

NOTES: (1) ALL UNITS IN μG/L, EXCEPT NOTED
(2) * TOXICITY ; ** 10^{-6} CANCER RISK

(3) REF. FEDERAL REGISTER, NOV. 28, 1980
EPA, QUALITY CRITERIA FOR WATER, JULY 1976

SECTION 5

ECOLOGY AND ENVIRONMENT, INC.
TOXICOLOGICAL ASSESSMENT
SITE: DELAWARE SAND AND GRAVEL
TDD NO.: F3-8202-04C
EPA NO.: DE-17
DATE: AUGUST 23, 1982

Based on review of Background Information, Site Observations and Laboratory Analytical Data, the following conclusions are indicated:

☐ There is no indication of an imminent or severe adverse toxicological impact to public health or the environment.

☐ There are possible indication(s) of potential adverse toxicological and/or environmental impact. A more comprehensive Site Investigation and Sampling Program is recommended.

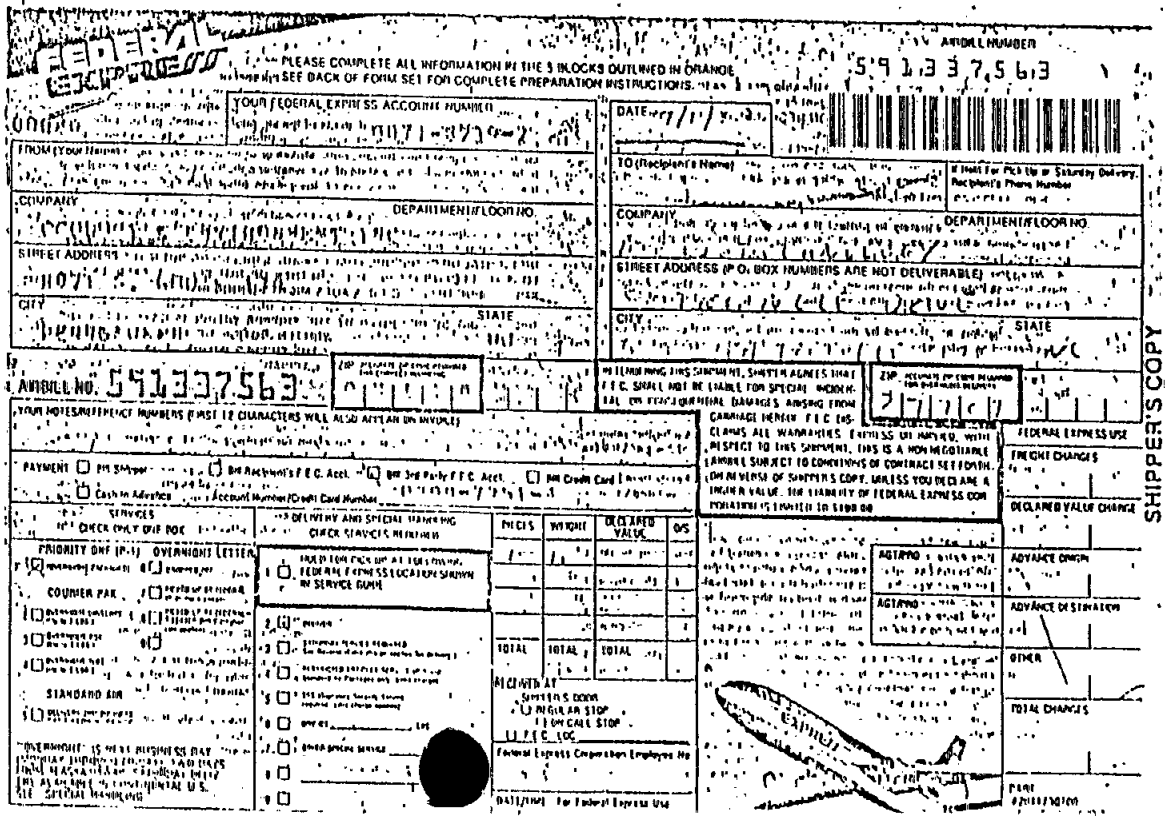
☑ A review of the information presented herein is sufficient to indicate a potential adverse impact on human health and/or the enivironment. A Toxicological Impact Assessment is included, as follows:

Analyses of on-site monitoring well and split-spoon cutting samples indicates substantial contamination of the underlying groundwater and soil (see Sample Data Summary). The known carcinogenic compound benzene (up to 180 ug/l), and the suspect carcinogens trichloroethylene (up to 27 ug/l), and dichloroethylene (up to 1,500 ug/l) were detected in the monitoring well samples. In addition to other compounds of toxicological concern, lead (up to 320 ug/l), mercury (up to 1 ug/l), and the potentially carcinogenic metals cadmium (up to 10 ug/l) and arsenic (up to 120 ug/l) were identified in the aqueous samples taken from monitoring wells. The affected Columbia and Upper Potomac Formations are the major source aquifers for potable supply. Presently, no wells near the site are used as drinking water sources. For details of groundwater condition refer to the text and hydrogeological reports F3-8108-11B and F3-8108-16B. Consumption of the contaminated groundwater represents a significant risk to human health.

Kenneth G. Symms, Ph.D., Toxicologist

SECTION 6

ATTACHMENT 1



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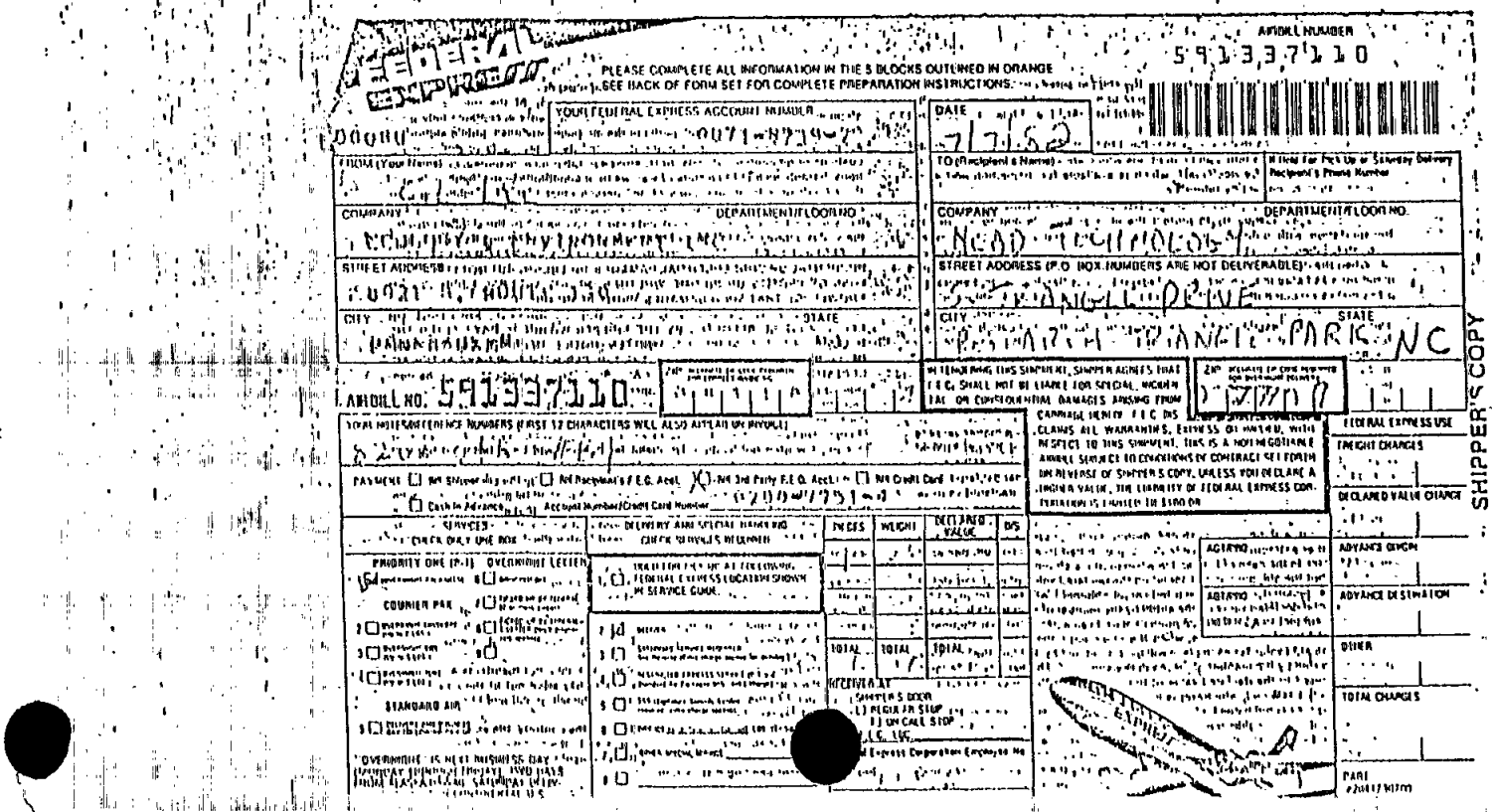

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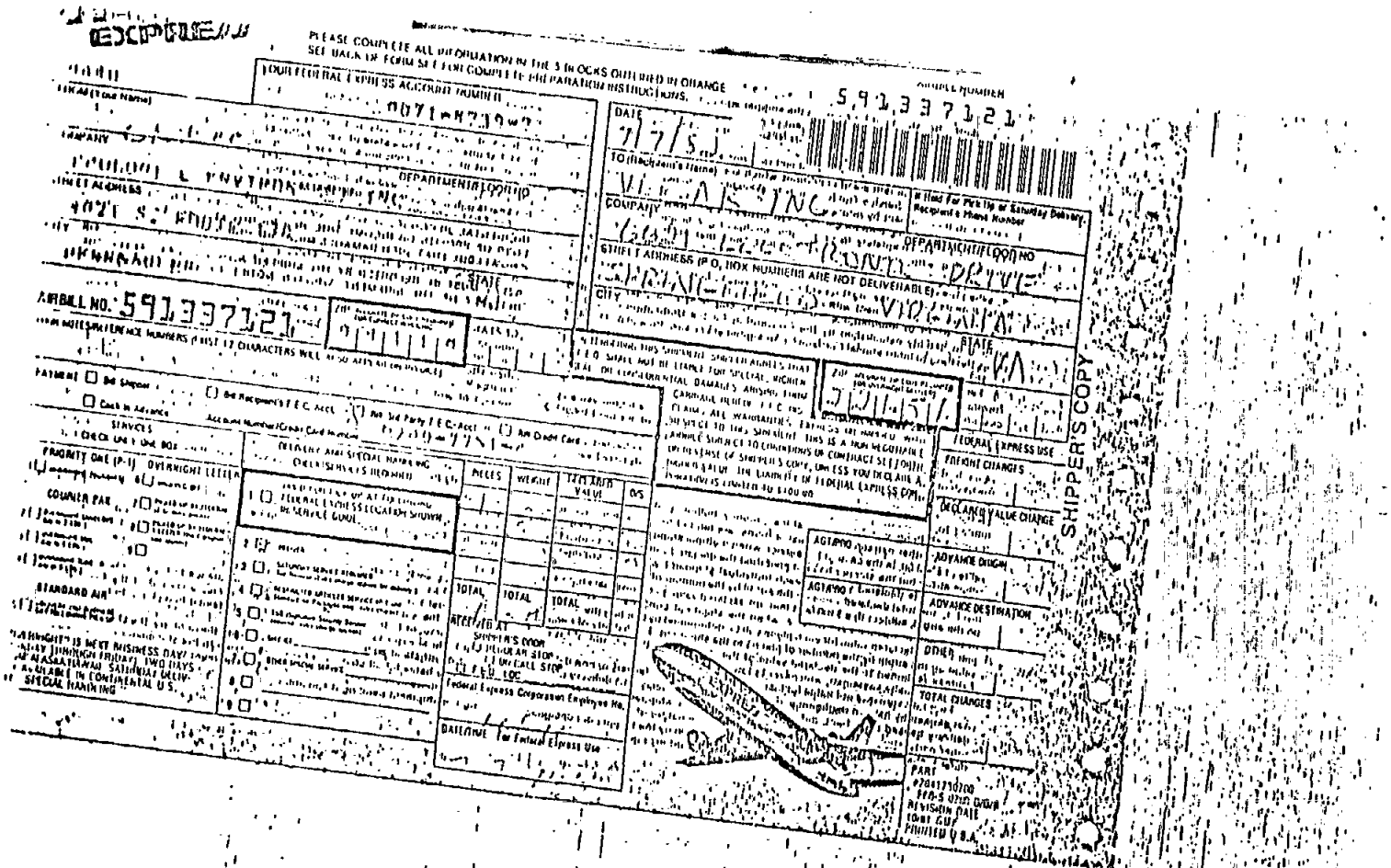
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Federal Express

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SEE BACK OF AIRBILL FOR COMPLETE PREPARATION INSTRUCTIONS

591337143

YOUR FEDERAL EXPRESS ACCOUNT NUMBER	DATE 4/7/82
FROM (Your Name)	TO (Recipient's Name)
COMPANY — DEPARTMENT/FLOOR NO.	COMPANY — DEPARTMENT/FLOOR NO.
STREET ADDRESS	STREET ADDRESS (P.O. BOX NUMBERS ARE NOT DELIVERABLE)
CITY — STATE	CITY — STATE NY
AIRBILL NO. 591337143 — ZIP	ZIP 17?59

PAYMENT ☐ Bill Shipper ☐ Bill Recipient's F.E.C. Acct. ☐ Bill 3rd Party F.E.C. Acct. ☐ Bill Credit Card
☐ Cash in Advance — Account Number/Credit Card Number

SERVICES — CHECK ONLY ONE BOX
PRIORITY ONE (P-1) — OVERNIGHT LETTER
COURIER PAK
STANDARD AIR

DELIVERY AND SPECIAL HANDLING — CHECK SERVICES REQUIRED
1 ☐ HOLD FOR PICK UP AT FOLLOWING FEDERAL EXPRESS LOCATION SHOWN IN SERVICE GUIDE

PIECES	WEIGHT	DECLARED VALUE	OS
TOTAL	TOTAL	TOTAL	

RECEIVED AT
SHIPPER'S DOOR
☐ REGULAR STOP
☐ ON CALL STOP
F.E.C. LOC.

Federal Express Corporation Employee No.
DATE/TIME For Federal Express Use

IN TENDERING THIS SHIPMENT, SHIPPER AGREES THAT F.E.C. SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM CARRIAGE HEREIN. F.E.C. DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS SHIPMENT. THIS IS A NON-NEGOTIABLE AIRBILL SUBJECT TO CONDITIONS OF CONTRACT SET FORTH ON REVERSE OF SHIPPER'S COPY. UNLESS YOU DECLARE A HIGHER VALUE, THE LIABILITY OF FEDERAL EXPRESS CORPORATION IS LIMITED TO $100.00

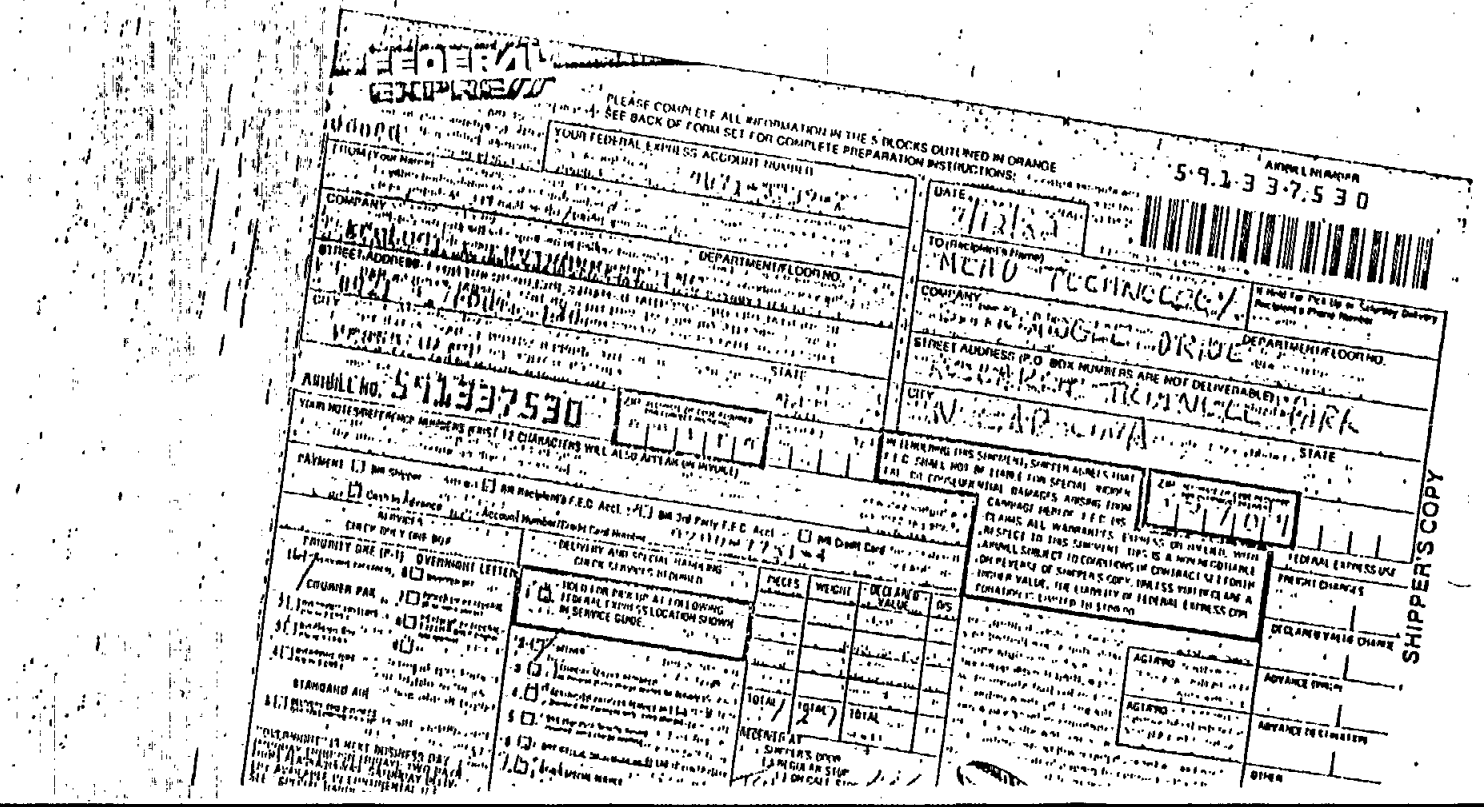
FEDERAL EXPRESS USE
FREIGHT CHARGES
DECLARED VALUE CHARGE
ADVANCE ORIGIN
ADVANCE DESTINATION
OTHER
TOTAL CHARGES

"OVERNIGHT" IS NEXT BUSINESS DAY (MONDAY THROUGH FRIDAY). TWO DAYS TO ALASKA/HAWAII. SATURDAY DELIVERY AVAILABLE IN CONTINENTAL U.S. SPECIAL HANDLING

PART #2041730700
REVISION DATE
PRINTED U.S.A.

SHIPPER'S COPY

AR100125


FEDERAL EXPRESS
EXPRESS
PLEASE COMPLETE ALL INFORMATION IN THE 5 BLOCKS OUTLINED IN ORANGE
SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS:
AIRBILL NUMBER
5913937530
AIRBILL NO. 5913937530
SHIPPER'S COPY

AR100126

5 4 1 3 3 7 5 4 1

PLEASE COMPLETE ALL INFORMATION IN THE SPACES OUTLINED IN ORANGE. SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS

YOUR FEDERAL EXPRESS ACCOUNT NUMBER

DATE

TO (Recipient's Name)

If Hold For Pick-Up or Saturday Delivery, Recipient's Phone Number

DEPARTMENT/FLOOR NO.

COMPANY

DEPARTMENT/FLOOR NO.

STREET ADDRESS (P.O. BOX NUMBERS ARE NOT DELIVERABLE)

CITY

STATE

ZIP

AIRBILL NO. 591337541

YOUR BILLING REFERENCE NUMBERS (FIRST 12 CHARACTERS WILL ALSO APPEAR ON INVOICE)

IN THE EVENT THIS SHIPMENT, SHIPPER AGREES THAT F.E.C. SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM CARRIAGE HEREOF. F.E.C. DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS SHIPMENT. THIS IS A NON-NEGOTIABLE AIRBILL SUBJECT TO CONDITIONS OF CONTRACT SET FORTH ON REVERSE OF SHIPPER'S COPY. UNLESS YOU DECLARE A HIGHER VALUE, THE LIABILITY OF FEDERAL EXPRESS CORPORATION IS LIMITED TO $100.00

Bill Shipper / Bill Recipient's F.E.C. Acct. / Bill 3rd Party F.E.C. Acct. / Bill Credit Card

Cash in Advance / Account Number/Credit Card Number

SERVICES — CHECK ONLY ONE BOX

PRIORITY ONE (P-1) / OVERNIGHT LETTER

COURIER PAK

STANDARD AIR

DELIVERY AND SPECIAL HANDLING — CHECK SERVICES REQUIRED

HOLD FOR PICK-UP AT FOLLOWING FEDERAL EXPRESS LOCATION SHOWN IN SERVICE GUIDE

PIECES	WEIGHT	DECLARED VALUE	O/S
TOTAL	TOTAL	TOTAL	

RECEIVED AT: SHIPPER'S DOOR / REGULAR STOP / ON-CALL STOP / F.E.C. LOC.

Federal Express Corporation Employee No.

DATE/TIME For Federal Express Use

FEDERAL EXPRESS USE

FREIGHT CHARGES

DECLARED VALUE CHARGE

ADVANCE ORIGIN

ADVANCE DESTINATION

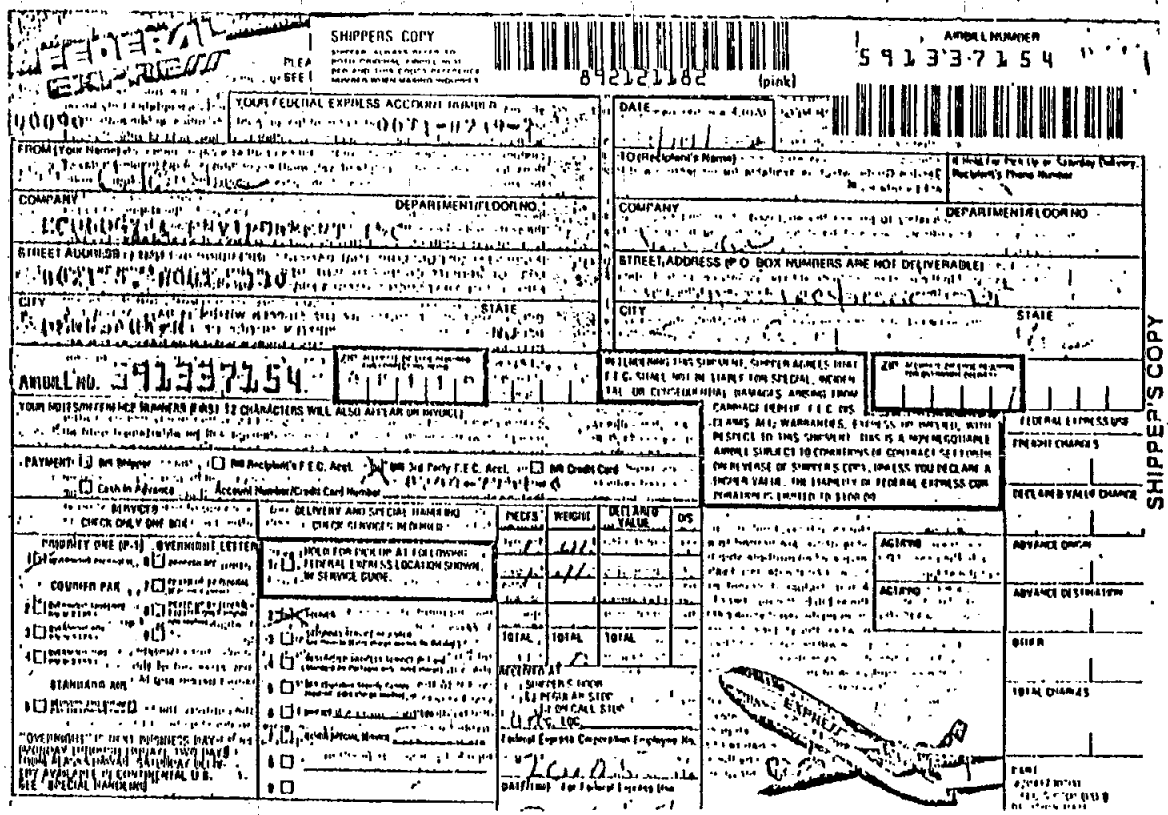
OTHER

TOTAL CHARGES

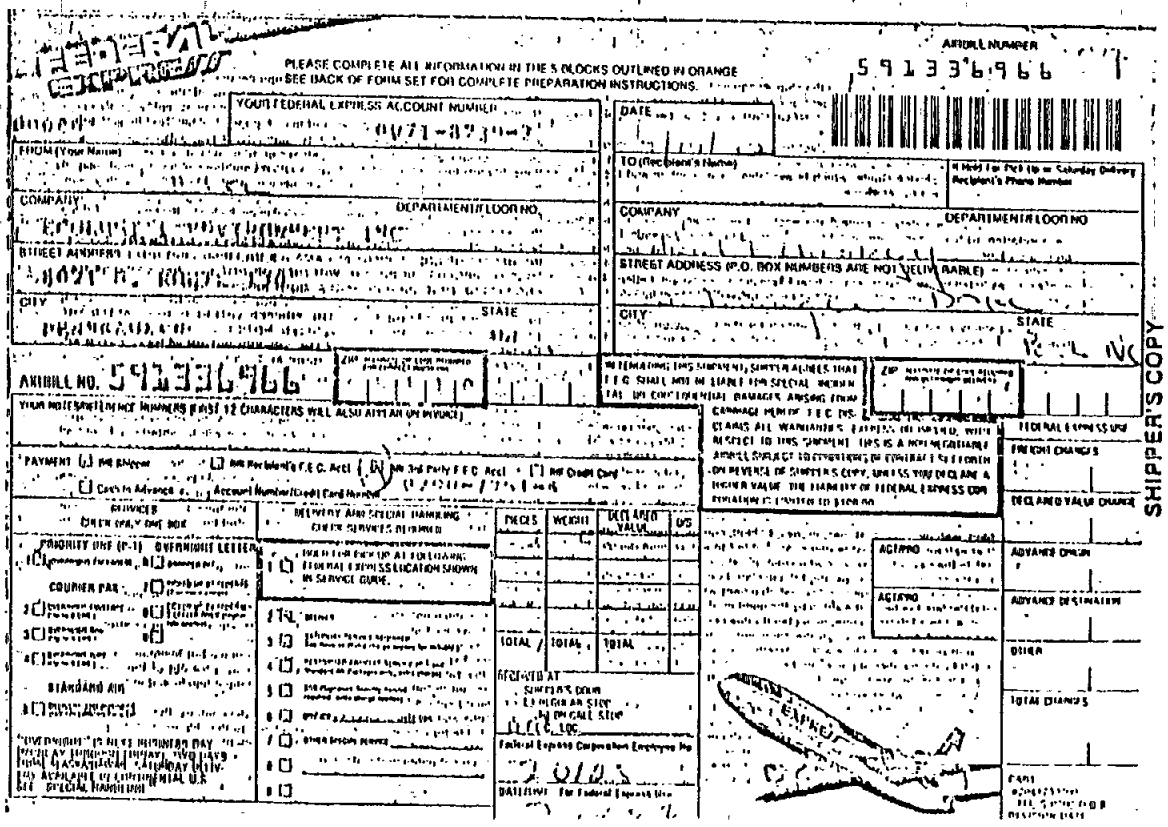
PART #2041730700 FEC S 0700 0/0/8 REVISION DATE 10/81 CNF PRINTED U.S.A.

SHIPPER'S COPY

AR100127


FEDERAL EXPRESS
SHIPPERS COPY
(pink)
AIRBILL NUMBER
5 9 1 3 3 7 1 5 4
YOUR FEDERAL EXPRESS ACCOUNT NUMBER
DATE
FROM (Your Name)
TO (Recipient's Name)
COMPANY
DEPARTMENT/FLOOR NO.
STREET ADDRESS
STREET ADDRESS (P.O. BOX NUMBERS ARE NOT DELIVERABLE)
CITY
STATE
AIRBILL NO. 591337154
YOUR INTERSHIPMENT NUMBER'S FIRST 12 CHARACTERS WILL ALSO APPEAR ON INVOICE.
PAYMENT
SERVICE
DELIVERY AND SPECIAL HANDLING
PIECES
WEIGHT
DECLARED VALUE
FEDERAL EXPRESS USE
FREIGHT CHARGES
DECLARED VALUE CHARGE
ADVANCE CHARGES
ADVANCE DESTINATION
OTHER
TOTAL CHARGES
SHIPPER'S COPY

AR100128



FEDERAL EXPRESS

PLEASE COMPLETE ALL INFORMATION IN THE 5 BLOCKS OUTLINED IN ORANGE
SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS.

AIRBILL NUMBER 5 9 1 3 3 6 9 6 6

YOUR FEDERAL EXPRESS ACCOUNT NUMBER

DATE

FROM (Your Name)

COMPANY

DEPARTMENT/FLOOR NO.

STREET ADDRESS

CITY

STATE

AIRBILL NO. 5 9 1 3 3 6 9 6 6

TO (Recipient's Name)

Recipient's Phone Number

COMPANY

DEPARTMENT/FLOOR NO.

STREET ADDRESS (P.O. BOX NUMBERS ARE NOT DELIVERABLE)

CITY

STATE

SHIPPER'S COPY

SERVICES

DELIVERY AND SPECIAL HANDLING

PIECES

WEIGHT

DECLARED VALUE

FEDERAL EXPRESS USE

FREIGHT CHARGES

DECLARED VALUE CHARGE

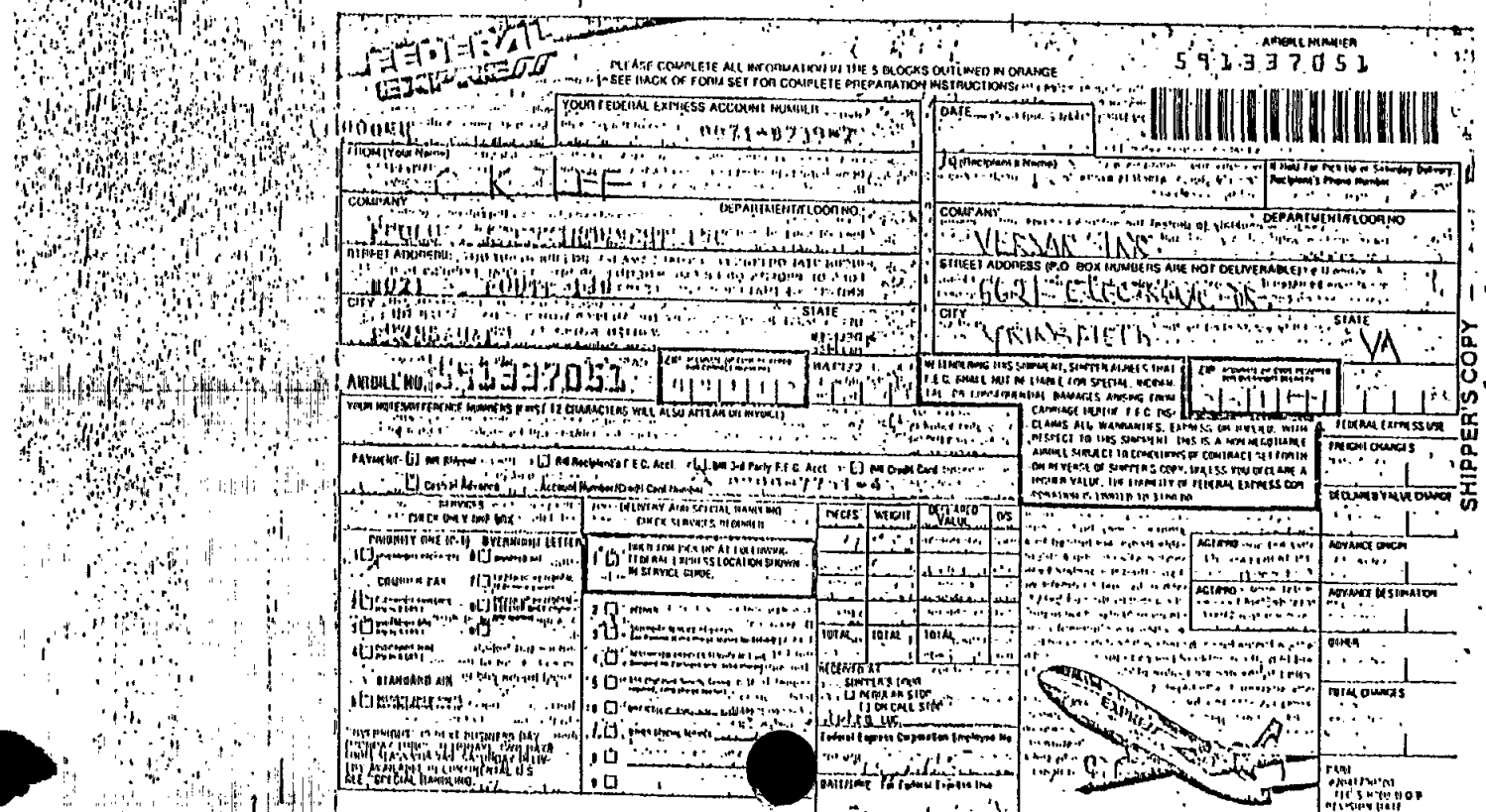
ADVANCE CHGS

ADVANCE DESTINATION

OTHER

TOTAL CHARGES

AR100130


FEDERAL EXPRESS
PLEASE COMPLETE ALL INFORMATION IN THE 5 BLOCKS OUTLINED IN ORANGE
SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS
AIRBILL NUMBER
591337051
YOUR FEDERAL EXPRESS ACCOUNT NUMBER
DATE
FROM (Your Name)
COMPANY
DEPARTMENT/FLOOR NO.
STREET ADDRESS (P.O. BOX NUMBERS ARE NOT DELIVERABLE)
CITY
STATE
ZIP
AIRBILL NO. 591337051
SHIPPER'S COPY

AR100131

NMENTAL PROTECTION AGENCY
Office * Enforcement

EPA Region 3 FIT
8021 Rt. 130
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO. 1SE-17 | PROJECT NAME [illegible]

SAMPLERS: (Signature) [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
MC9111	7/14	9:50		X	WELL # 6-5	2	1	1					c.1616
MC9113	7/14	9:15		X	WELL # 95	2	1	1					c.1621
MC9114	7/14	10:00		X	WELL # 6-1	2	1	1					c.1622
MC9117	7/14	9:30		X	WELL # 95	2	1	1					c.1623
MC9118	7/14	10:15		X	WELL # 6-1	2	1	1					c.1624
MC9119	7/14	-		X	SWAMP BLANK	2	1	1					c.1625
					total	12							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
C. K. Ekoo	7/14/89 [illegible]				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

[illegible]: Original Accompanies Shipment; Copy to Coordinator Field Files

AR100132

INORGANICS TRAFFIC REPORT

Sample Number: MC [illegible]

(1) Case Number: [illegible]
Sample Site Name/Code: [illegible]

(2) SAMPLE CONCENTRATION
(Check One)
___ Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX
(Check One)
___ Water
___ Soil/Sediment

(4) Ship To: [illegible]
Attn:
Transfer Ship To:

(5) Sampling Office: [illegible]
Sampling Personnel: [illegible]
(Name) [illegible]
(Phone) [illegible]
Sampling Date:
(Begin) [illegible] (End) [illegible]

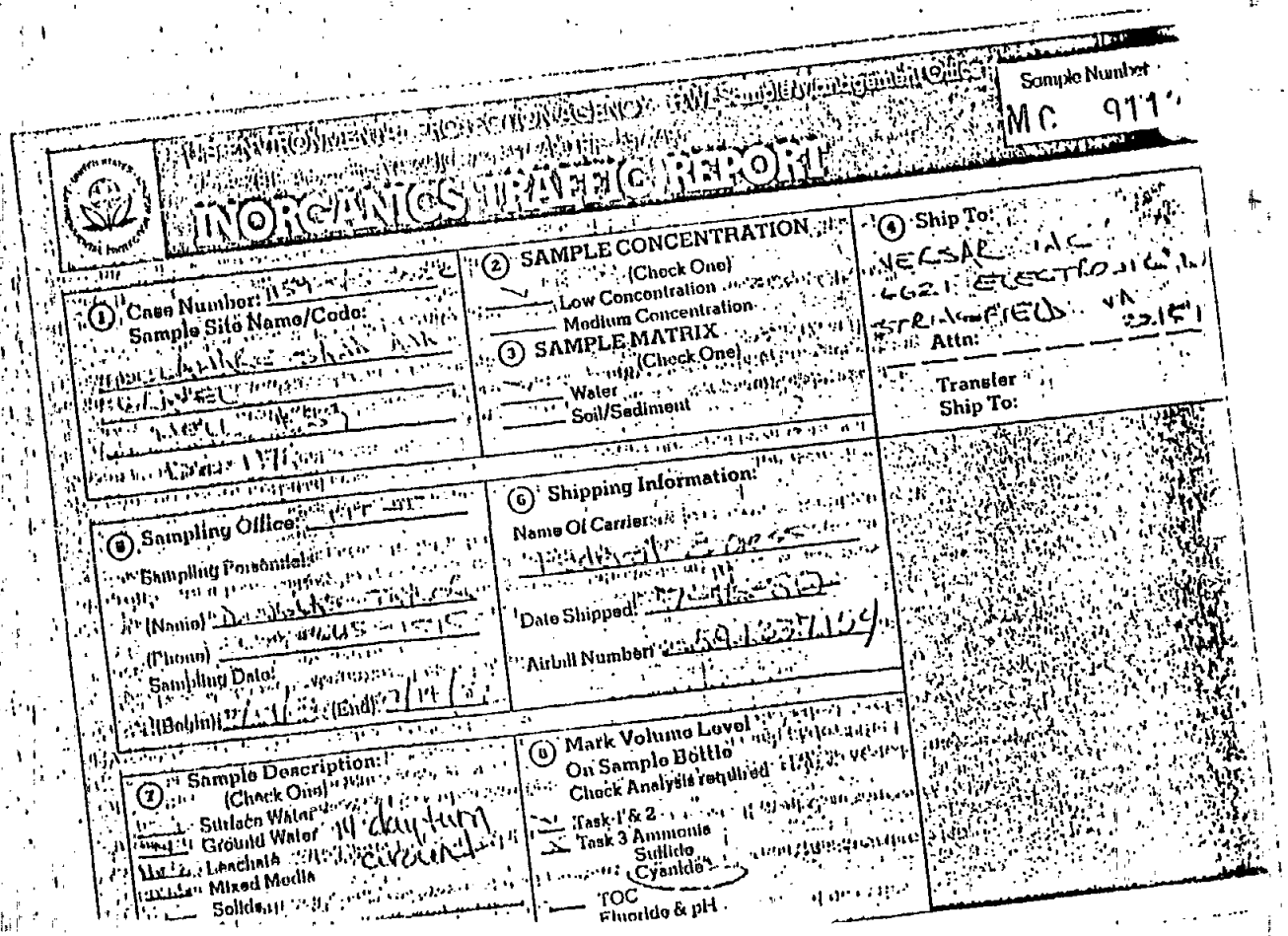
(6) Shipping Information:
Name Of Carrier: [illegible]
Date Shipped: [illegible]
Airbill Number: [illegible]

(7) Sample Description:
(Check One)
___ Surface Water
_✓_ Ground Water
___ Leachate
___ Mixed Media
___ Solids
___ Other ______ (specify)

MATCHES ORGANIC SAMPLE NO. ______

(8) Mark Volume Level On Sample Bottle
Check Analysis required
___ Task 1 & 2
___ Task 3 Ammonia
Sulfate
Cyanide
TOC
Fluoride & pH

AR100133



INORGANICS TRAFFIC REPORT

Sample Number MC 911

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION (Check One)
Low Concentration
Medium Concentration

(3) SAMPLE MATRIX (Check One)
Water
Soil/Sediment

(4) Ship To:
NESAR, INC.
6621 ELECTRONIC DR.
SPRINGFIELD VA 22151
Attn:

Transfer Ship To:

(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description: (Check One)
Surface Water
Ground Water
Leachate
Mixed Media
Solids

(8) Mark Volume Level On Sample Bottle
Check Analysis required
Task 1 & 2
Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

AR100234

INORGANICS TRAFFIC REPORT

Sample Number
MC 91

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
Low Concentration
Medium Concentration

(3) SAMPLE MATRIX
(Check One)
Water
Soil/Sediment

(4) Ship To:
Mersar
Springfield
Attn:

Transfer
Ship To:

(5) Sampling Office:
Shipping Person/Hotline
(Name)
(Phone)
Sampling Date:
(Begin) (End)

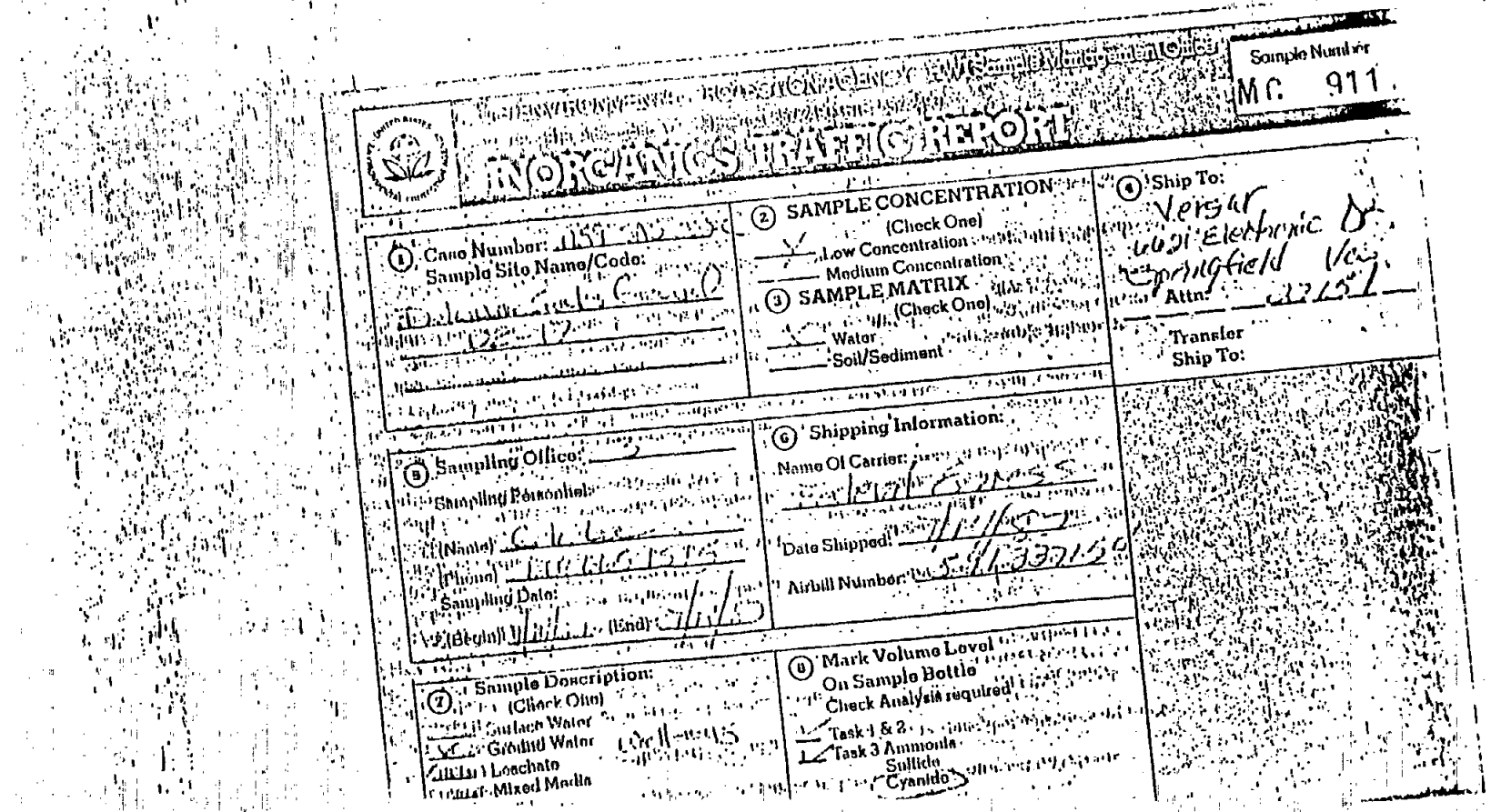
(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
Surface Water
Ground Water
Leachate
Mixed Media
Solids
Other
(specify)
MATCHES ORGANIC SAMPLE NO.

(8) Mark Volume Level On Sample Bottle
Check Analysis required
Task 1 & 2
Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

REGIONAL OFFICE PURPOSE:

AR100135



INORGANICS TRAFFIC REPORT

Sample Number MC 911

① Case Number:
Sample Site Name/Code:

② SAMPLE CONCENTRATION (Check One)
X Low Concentration
Medium Concentration

③ SAMPLE MATRIX (Check One)
X Water
Soil/Sediment

④ Ship To:
Versar
6621 Electronic Dr.
Springfield Va.
Attn:

Transfer Ship To:

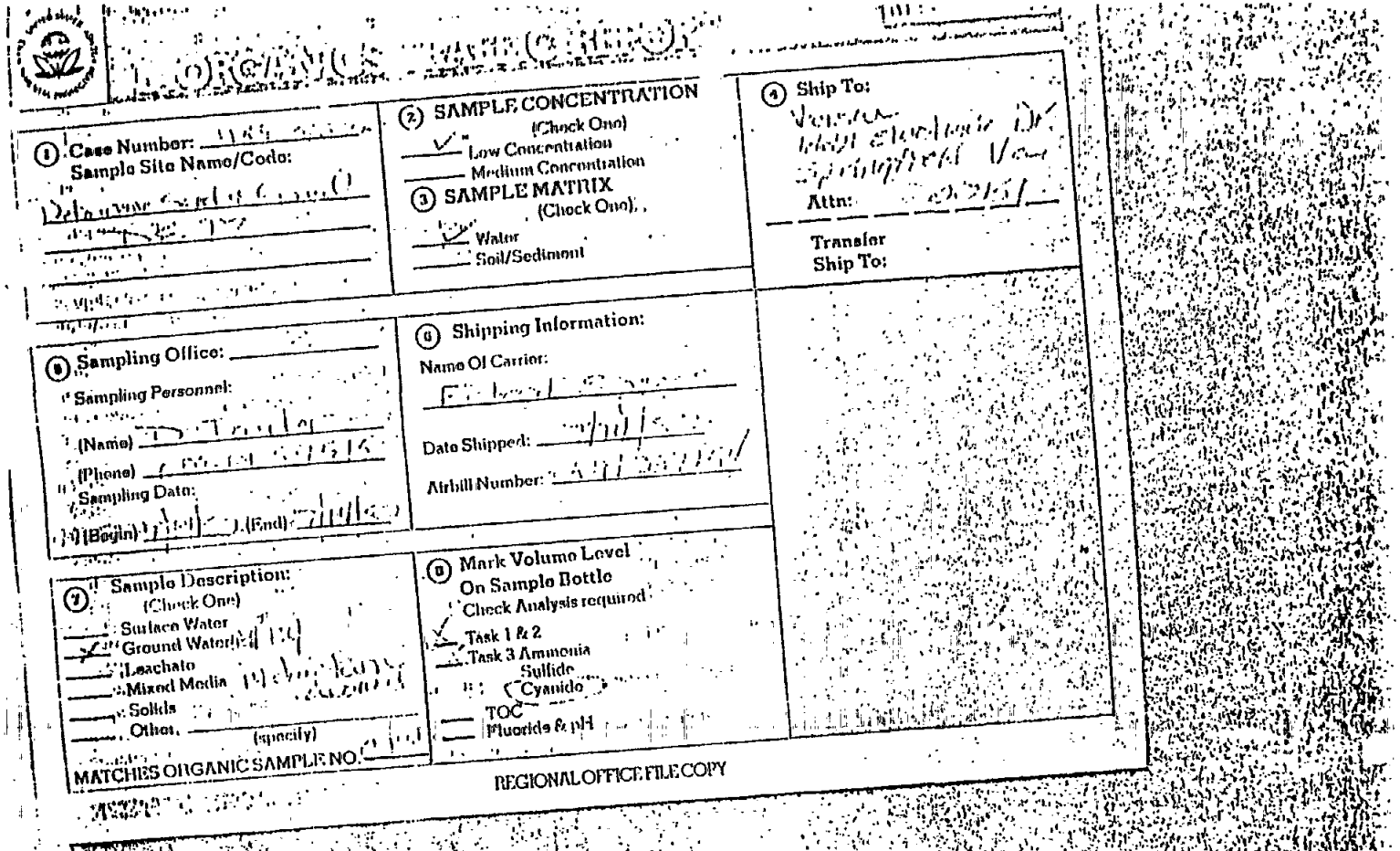
⑤ Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

⑥ Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

⑦ Sample Description: (Check One)
Surface Water
X Ground Water
Leachate
Mixed Media

⑧ Mark Volume Level On Sample Bottle
Check Analysis required
X Task 1 & 2
X Task 3 Ammonia
Sulfide
Cyanide

AR 100136



(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
✓ Low Concentration
Medium Concentration

(3) SAMPLE MATRIX
(Check One)
✓ Water
Soil/Sediment

(4) Ship To:
Attn:
Transfer Ship To:

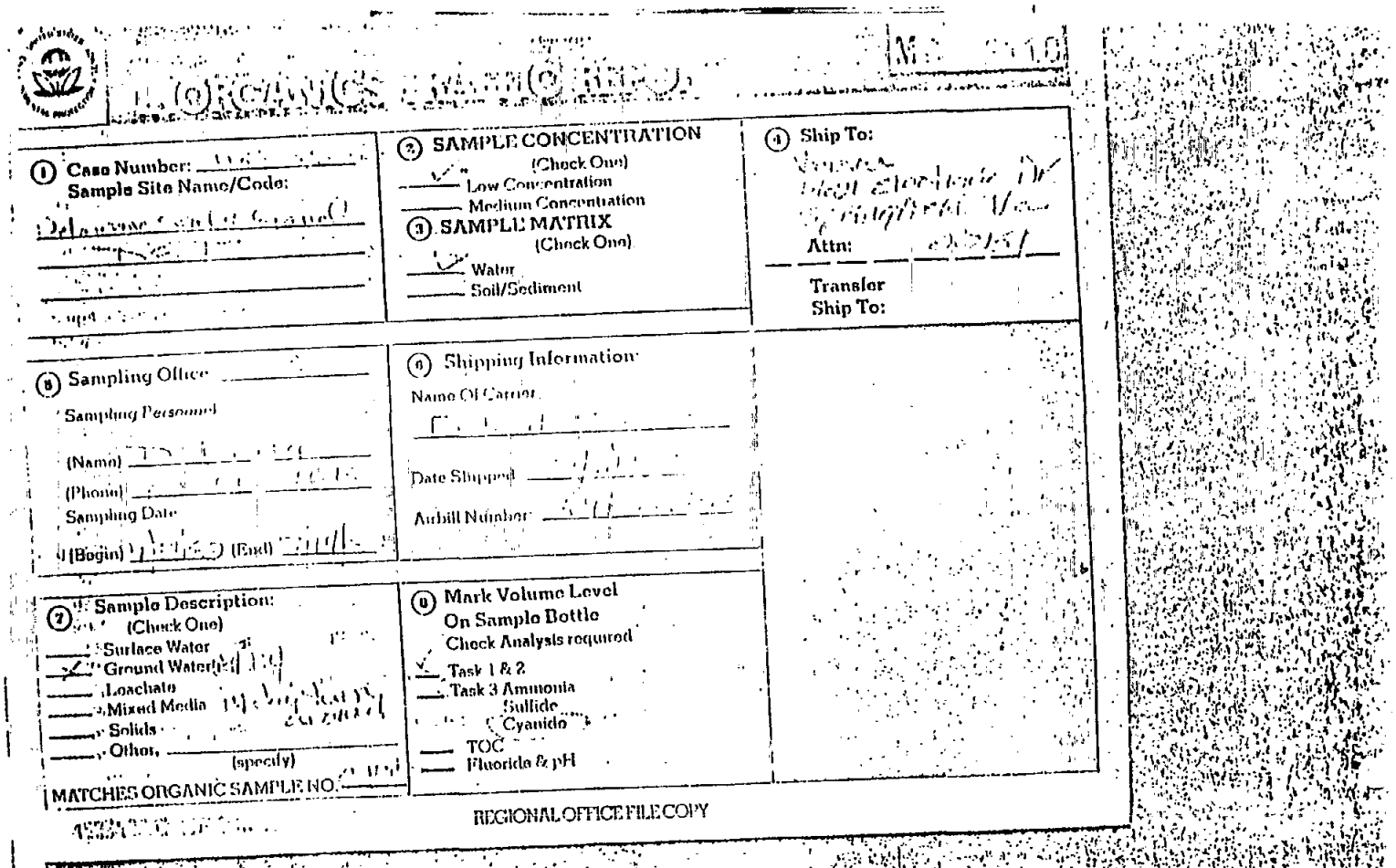
(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
Surface Water
✓ Ground Water
Leachate
Mixed Media
Solids
Other, (specify)
MATCHES ORGANIC SAMPLE NO.

(8) Mark Volume Level On Sample Bottle
Check Analysis required
✓ Task 1 & 2
Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

REGIONAL OFFICE FILE COPY



ORGANICS ANALYSIS DATA SHEET

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
— Low Concentration
— Medium Concentration

(3) SAMPLE MATRIX
(Check One)
— Water
— Soil/Sediment

(4) Ship To:
Attn:
Transfer Ship To:

(5) Sampling Office
Sampling Personnel
(Name)
(Phone)
Sampling Date
(Begin) (End)

(6) Shipping Information
Name Of Carrier
Date Shipped
Airbill Number

(7) Sample Description:
(Check One)
— Surface Water
— Ground Water
— Leachate
— Mixed Media
— Solids
— Other, (specify)

(8) Mark Volume Level On Sample Bottle
Check Analysis required
— Task 1 & 2
— Task 3 Ammonia
Sulfide
Cyanide
— TOC
— Fluoride & pH

MATCHES ORGANIC SAMPLE NO.

REGIONAL OFFICE FILE COPY

INORGANICS TRAFFIC REPORT

Sample Number
MC 919

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
___ Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX
(Check One)
___ Water
___ Soil/Sediment

(4) Ship To:
Versar
6621 Electronic Dr
Springfield Va.
Attn:
Transfer
Ship To:

(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
___ Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
___ Other
(specify)
MATCHES ORGANIC SAMPLE NO.

(8) Mark Volume Level
On Sample Bottle
Check Analysis required
___ Task 1 & 2
___ Task 3 Ammonia
Sulfide
Cyanide
TOG
Fluoride & pH

REGIONAL OFFICE FILE COPY

AR100139

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region 3 FIT
8021 Rt. 130
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO. | PROJECT NAME

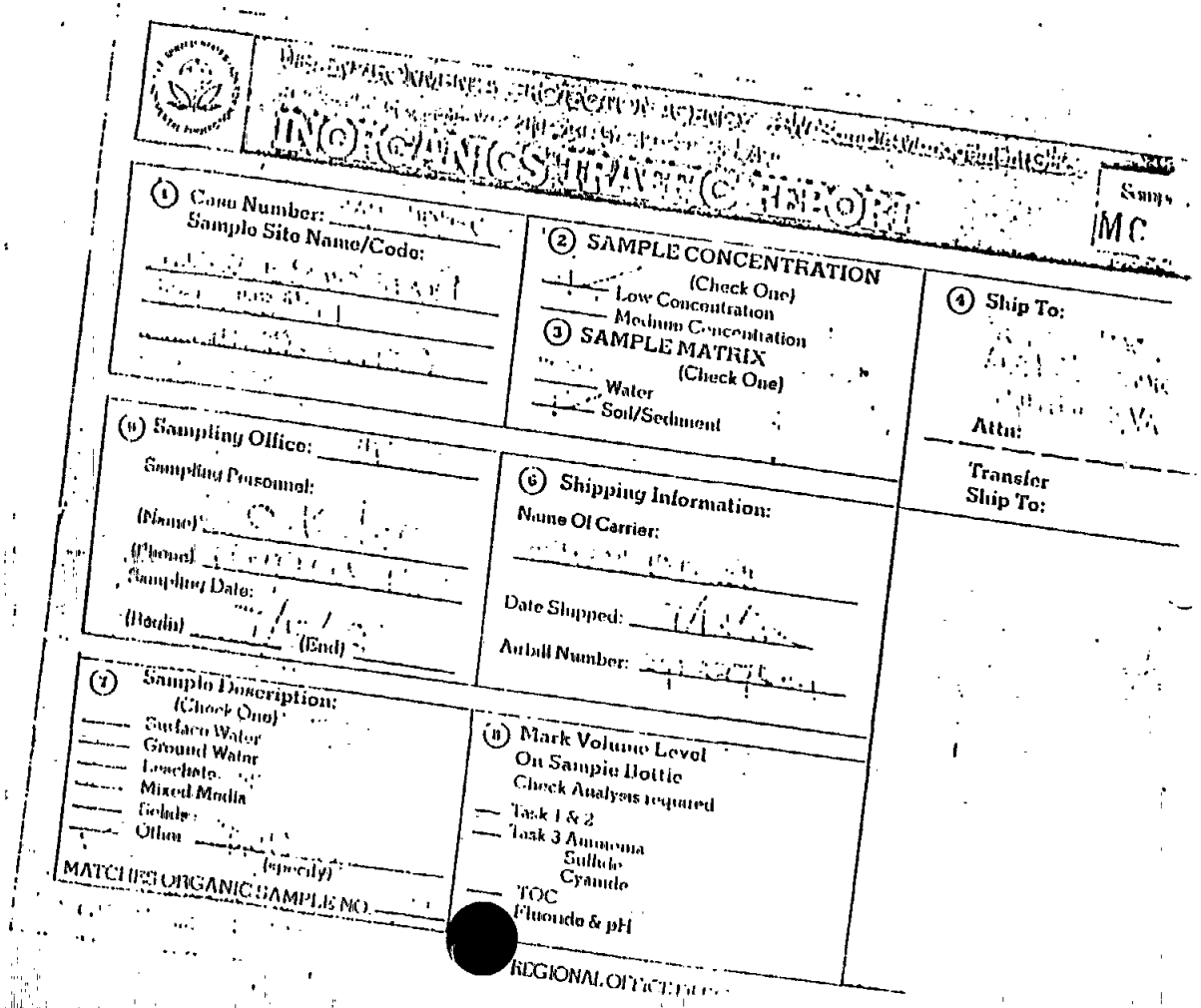
SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

AR100140



INORGANICS/ANALYSIS REQUEST

1 Case Number:
Sample Site Name/Code:

2 SAMPLE CONCENTRATION
(Check One)
Low Concentration
Medium Concentration

3 SAMPLE MATRIX
(Check One)
Water
Soil/Sediment

4 Ship To:
Attn:
Transfer
Ship To:

9 Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

5 Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

7 Sample Description:
(Check One)
Surface Water
Ground Water
Leachate
Mixed Media
Solids
Other (Specify)
MATCHES ORGANIC SAMPLE NO.

8 Mark Volume Level
On Sample Bottle
Check Analyses required
Task 1 & 2
Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

REGIONAL OFFICE

INORGANICS TRAFFIC REPORT

Sample Number

MB 909

(1) Case Number:

Sample Site Name/Code:

(2) SAMPLE CONCENTRATION

(Check One)

___ Low Concentration

___ Medium Concentration

(3) SAMPLE MATRIX

(Check One)

___ Water

___ Soil/Sediment

(4) Ship To:

Attn:

Transfer Ship To:

(5) Sampling Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Begin) (End)

(6) Shipping Information:

Name Of Carrier:

Date Shipped:

Airbill Number:

(7) Sample Description:

(Check One)

___ Surface Water

___ Ground Water

___ Leachate

___ Mixed Media

___ Solids

___ Other, ___ (specify)

MATCH ORGANIC SAMPLE NO. ___

(8) Mark Volume Level On Sample Bottle

Check Analysis required

___ Task 1 & 2

___ Task 3 Ammonia

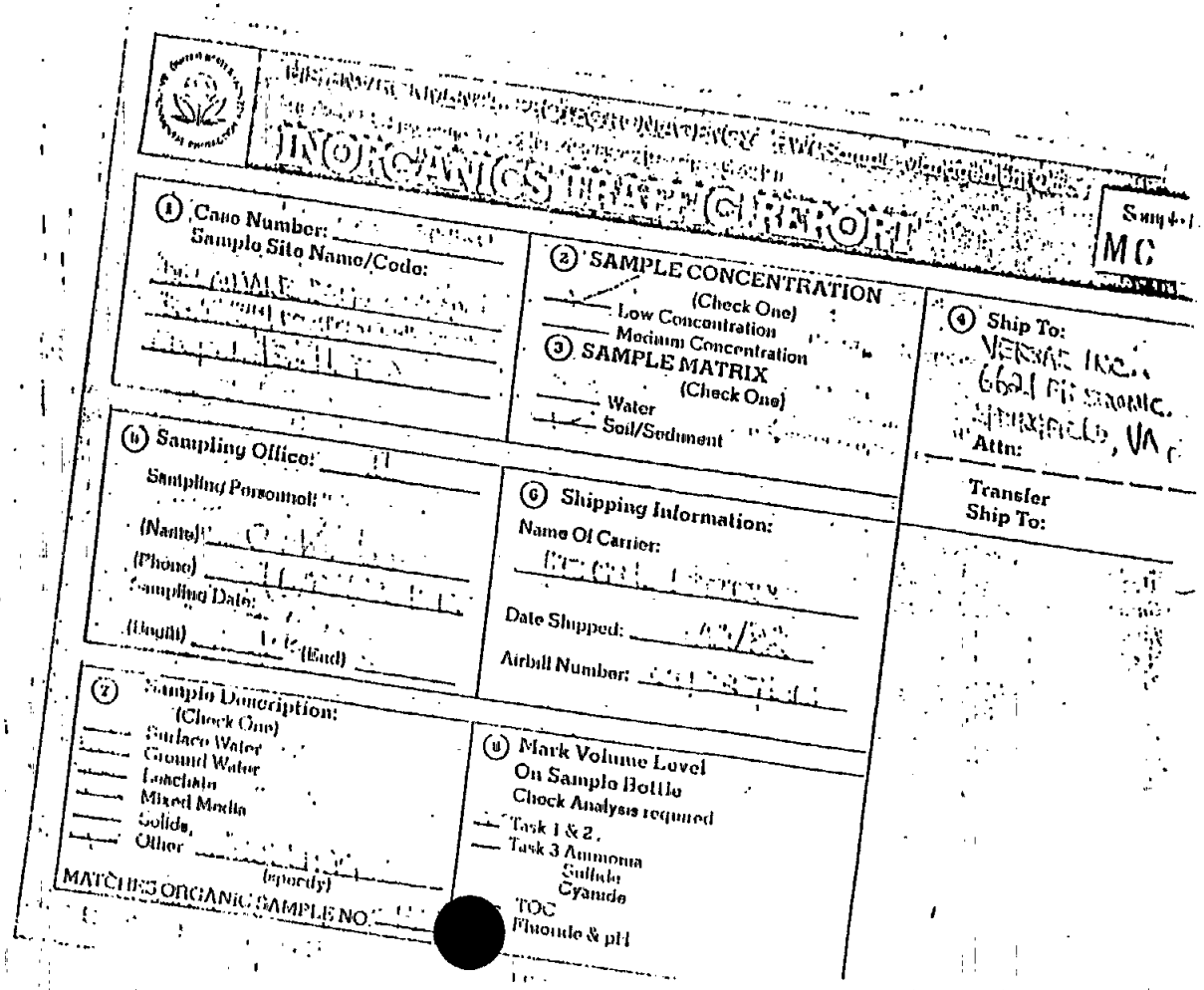
Sulfide

Cyanide

___ TOC

___ Fluoride & pH

AR100142



INORGANICS TRAFFIC REPORT

MC

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
Low Concentration
Medium Concentration

(3) SAMPLE MATRIX
(Check One)
Water
Soil/Sediment

(4) Ship To:
VERSAR INC.
6621 Electronic
Springfield, VA
Attn:

Transfer
Ship To:

(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
Surface Water
Ground Water
Leachate
Mixed Media
Solids
Other
(specify)

(8) Mark Volume Level
On Sample Bottle
Check Analyses required
Task 1 & 2
Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

MATCHES ORGANIC SAMPLE NO.

AR100143

INORGANICS TRAFFIC REPORT

Sample Number: MC 909

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
___ Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX
(Check One)
___ Water
___ Soil/Sediment

(4) Ship To:
Attn:

Transfer
Ship To:

(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
___ Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
___ Other ________ (specify)

MATCHES ORGANIC SAMPLE NO.

(8) Mark Volume Level
On Sample Bottle
Check Analysis required
___ Task 1 & 2
___ Task 3 Ammonia
Sulfide
Cyanide
___ TOC
___ Fluoride & pH

AR100144

ORGANICS TRAFFIC REPORT

Sample Number
MC 90

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
___ Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX
(Check One)
___ Water
___ Soil/Sediment

(4) Ship To:
Attn:

Transfer Ship To:

(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
___ Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
___ Other
(Specify)
MATCHING ORGANIC SAMPLE NO.

(8) Mark Volume Level On Sample Bottle
Check Analysis required
___ Task 1 & 2
___ Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

REGIONAL OFFICE USE ONLY

AR100145

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region 3 FIT
6021 Rt. 130
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
[illegible]	[illegible]

SAMPLERS: *(Signature)* C. K. Lee

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS
C1612	[illegible]	[illegible]		X	Hole [illegible]		1						[illegible]
C1613	[illegible]	1345		X	Hole [illegible]	1	1						[illegible]
C1614	[illegible]	[illegible]		X	Hole [illegible]	1	1						[illegible]
C1615	[illegible]	[illegible]		X	Hole [illegible]	1	1						[illegible]
C1526	[illegible]	[illegible]		X	Hole [illegible]	1	1						[illegible]

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
C. K. [illegible]	[illegible] 1700				
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	
				[illegible]	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

AR100146

ORGANICS TRAFFIC REPORT

Case Number: C 1528

Sample Site Name/Code:

② SAMPLE CONCENTRATION (Check One)

X Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX (Check One)

___ Water
X Soil/Sediment

④ Ship To:

Attn:

Transfer Ship To:

⑤ Regional Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Start) (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment	1	8-oz
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Name of Carrier

Date Shipped:

⑧ Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate X Other (specify) Soil

⑨ Sample Location

⑩ Special Handling Instructions: (e.g., safety precautions, hazardous nature) SPECIAL HANDLING #1159

SAS 14 DAY TURNAROUND

REGIONAL OFFICE FILE COPY

AR100147

ORGANICS TRAFFIC REPORT

Sample No. C 1612

Case Number:

Sample Site Name/Code:

② SAMPLE CONCENTRATION
(Check One)

1 Low Concentration
2 Medium Concentration

③ SAMPLE MATRIX
(Check One)

___ Water
___ Soil/Sediment

④ Ship To:

Attn:

Transfer
Ship To:

⑤ Regional Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Name of Carrier

Date Shipped:

Number:

① Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate ___ Other (specify)

⑨ Sample Location

⑧ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

REGIONAL OFFICE FILE COPY

AR100148

ORGANICS TRAINING REPORT

Sample Number C 1613

(1) Case Number:

Sample Site Name/Code:

(2) SAMPLE CONCENTRATION (Check One)

___ Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX (Check One)

___ Water
___ Soil/Sediment

(4) Ship To:

Attn:

Transfer
Ship To:

(6) Regional Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Start) (End)

(7) Shipping Information

Name of Carrier

Date Shipped:

Airbill Number:

(5) For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment		
Water (Ext/VOA)		
Other		

(8) Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate ___ Other (specify)

(9) Sample Location

(10) Special Handling Instructions: (e.g. safety precautions, hazardous nature)

REGIONAL OFFICE FILE COPY

AR100149

ORGANICS TRAFFIC REPORT

Report Number: C 1615

① Case Number:

Sample Site Name/Code:

② SAMPLE CONCENTRATION
(Check One)

___ Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)

___ Water
___ Soil/Sediment

④ Ship To:

Attn:

Transfer
Ship To:

⑤ Regional Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Start) (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Name of Carrier

Date Shipped:

Bill Number:

⑧ Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate ___ Other (specify)

⑨ Sample Location

⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

REGIONAL OFFICE FILE COPY

AR100151

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region [illegible]
[illegible] Rt. 130
Pennsauken, NJ [illegible]

CHAIN OF CUST[illegible] RECORD

PROJ. NO.: [illegible]

PROJECT NAME: [illegible]

SAMPLERS: *(Signature)* [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS
[illegible]9094	[illegible]	1600		✓	[illegible]	1	1						[illegible]
[illegible]9095	7/13	[illegible]		✓	[illegible]	1	1						" [illegible] " [illegible]
[illegible]9112	[illegible]	10:50		✓	[illegible]	1	1						" [illegible] " [illegible]

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[illegible]	[illegible]				

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

Sample Number

M[illegible]

INORGANICS TRAFFIC REPORT

(1) Case Number: ____ Sample Site Name/Code: ____ ____ ____	(2) SAMPLE CONCENTRATION (Check One) ____ Low Concentration ____ Medium Concentration (3) SAMPLE MATRIX (Check One) ____ Water ____ Soil/Sediment	(4) Ship To: [illegible] Attn: ____ Transfer Ship To:
(5) Sampling Office: ____ Sampling Personnel: (Name) ____ (Phone) ____ Sampling Date: (Begin) ____ (End) ____	(6) Shipping Information: Name Of Carrier: ____ Date Shipped: ____ Airbill Number: ____	
(7) Sample Description: (Check One) ____ Surface Water ____ Ground Water ____ Leachate ____ Mixed Media ____ Solids ____ Other ____ (specify) MATCHES ORGANIC SAMPLE NO. ____	(8) Mark Volume Level On Sample Bottle Check Analysis required __ Task 1 & 2 __ Task 3 Ammonia Sulfide Cyanide __ [illegible]C __ [illegible]ride & pH	

INORGANIC TRAFFIC REPORT

Sample Number
MC

① Case Number:
Sample Site Name/Code:

② SAMPLE CONCENTRATION
(Check One)
___ Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)
___ Water
___ Soil/Sediment

④ Ship To:
Attn:
Transfer
Ship To:

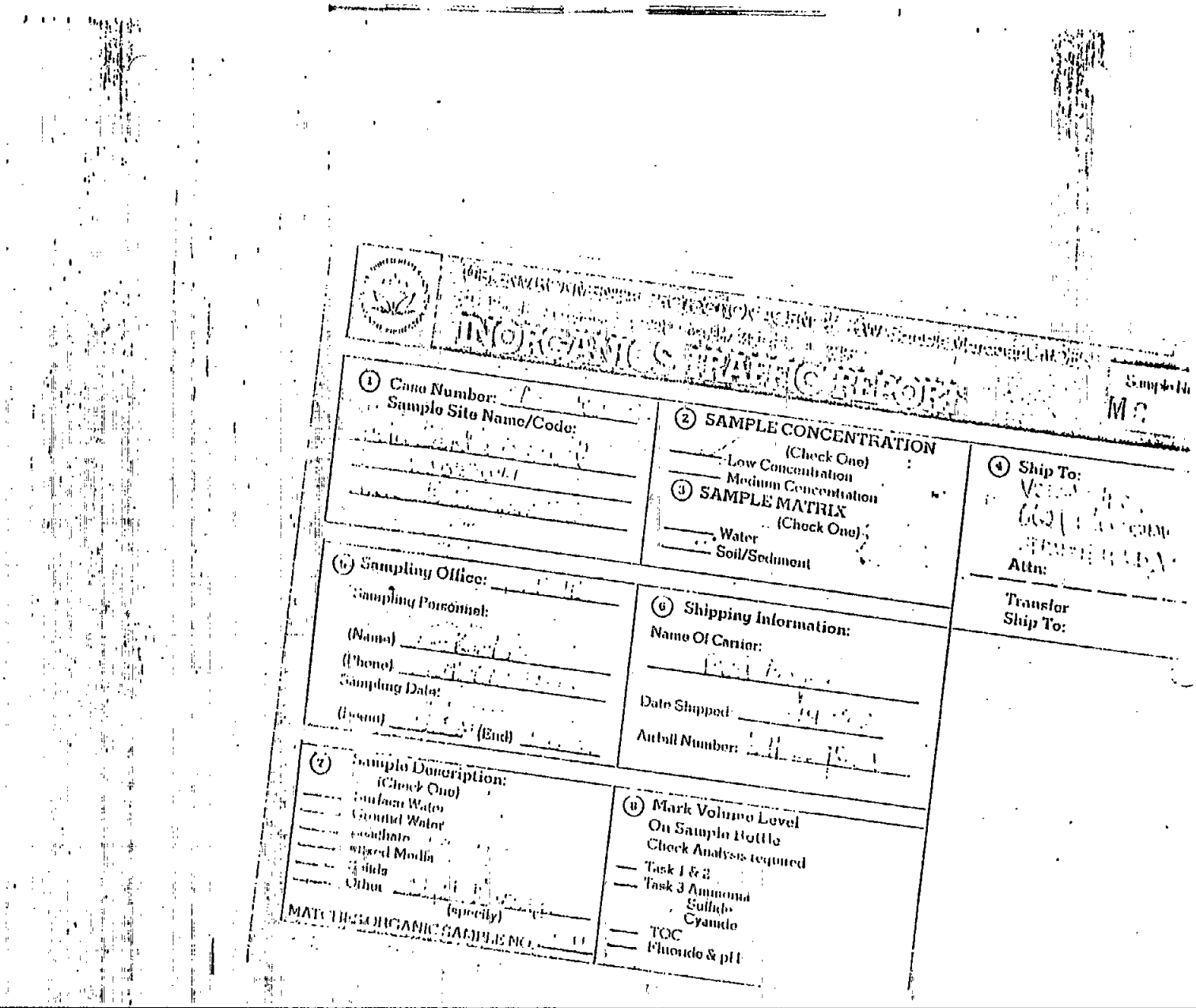
⑤ Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

⑥ Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

⑦ Sample Description:
(Check One)
___ Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
___ Other ___ (specify)

MATCHING ORGANIC SAMPLE NO. ___

⑧ Mark Volume Level
On Sample Bottle
Check Analysis required
___ Task 1 & 2
___ Task 3 Ammonia
Sulfide
Cyanide
___ TOC
___ Fluoride & pH



INORGANIC TRACE CHRON

1 Case Number:
Sample Site Name/Code:

2 SAMPLE CONCENTRATION
(Check One)
Low Concentration
Medium Concentration

3 SAMPLE MATRIX
(Check One)
Water
Soil/Sediment

4 Ship To:
Attn:
Transfer
Ship To:

5 Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Start) (End)

6 Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

7 Sample Description:
(Check One)
Surface Water
Ground Water
Leachate
Mixed Media
Solids
Other
(specify)

8 Mark Volume Level
On Sample Bottle
Check Analysis required
Task 1 & 2
Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

MATCH ORGANIC SAMPLE NO.

AR100155

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region [illegible]
8021 Rt. 130 [illegible]
Pennsauken, N.J. [illegible]

CHAIN OF CU[STO]DY RECORD

PROJ. NO.	PROJECT NAME
[illegible]	[illegible]

SAMPLERS: *(Signature)* C. K. [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS						REMARKS
B-1 [illegible] #5	7/9/8[illegible]	[illegible]		✓	[illegible]	1	1					[illegible]
												[illegible]
												[illegible]
												[illegible]

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
C. K. [illegible]	7/9/82 [illegible]				
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field F[iles]

INORGANICS TRAFFIC REPORT

Sample Number: MC 90[illegible]

1. Case Number: [illegible]
   Sample Site Name/Code: [illegible]

2. SAMPLE CONCENTRATION (Check One)
   ___ Low Concentration
   ___ Medium Concentration

3. SAMPLE MATRIX (Check One)
   ___ Water
   ___ Soil/Sediment

4. Ship To: [illegible]
   Attn:
   Transfer Ship To:

5. Sampling Office: [illegible]
   Sampling Personnel:
   (Name) [illegible]
   (Phone) [illegible]
   Sampling Date: [illegible]
   (Begin) [illegible] (End) [illegible]

6. Shipping Information:
   Name Of Carrier: [illegible]
   Date Shipped: [illegible]
   Airbill Number: [illegible]

7. Sample Description: (Check One)
   ___ Surface Water
   ___ Ground Water
   ___ Leachate
   ___ Mixed Media
   ___ Solids
   ___ Other ___ (specify)
   MATCHING ORGANIC SAMPLE NO. ___

8. Mark Volume Level On Sample Bottle
   Check Analysis required
   ___ Task 1 & 2
   ___ Task 3 Ammonia
   Sulfide
   Cyanide
   ___ TOC
   ___ Fluoride & pH

AR100157

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region 3 FIT
[illegible]
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO. [illegible] | PROJECT NAME [illegible]

SAMPLERS: (Signature) [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
[illegible]	7/8/	[illegible]		✓	[illegible]	1	[illegible]
					[illegible]		[illegible]

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[illegible]	7/7/87 [illegible]				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

ARI001158

ORGANICS TRAFFIC REPORT

Sample Number

① Case Number:

Sample Site Name/Code:

② SAMPLE CONCENTRATION
(Check One)

✓ Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)

___ Water
___ Soil/Sediment

④ Ship To:

Attn:

Transfer
Ship To:

⑤ Regional Office: 1

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Signature)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment	1	
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Name of Carrier

Date Shipped:

Airbill Number

⑧ Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ✓ Solids
___ Leachate ___ Other (specify)

⑨ Sample Location

⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

SAS = 14 day turnaround

AR100159

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region 3 FIT
8021 Rt. 130
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
[illegible]	[illegible]

SAMPLERS: *(Signature)* [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS			REMARKS
[illegible]	[illegible]	[illegible]		X	Well # [illegible]	[illegible]	1	2	[illegible]
[illegible]	[illegible]	[illegible]		X	Well # 39	3	1	1	[illegible]
[illegible]	[illegible]	[illegible]		X	Well # 31	3	1	2	[illegible]
[illegible]	[illegible]	[illegible]		X	Well # [illegible]	[illegible]	1	2	[illegible]
[illegible]	[illegible]	[illegible]		X	[illegible]	[illegible]	1	2	[illegible]
[illegible]	[illegible]			X	[illegible]	3	1	2	[illegible]
					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[illegible]	[illegible]				
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	
				[illegible]	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

ORGANICS TRAFFIC REPORT

① Case Number:

Sample Site Name/Code:

② SAMPLE CONCENTRATION
(Check One)

/ Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)

___ Water
___ Soil/Sediment

④ Ship To:

Attn:

Transfer
Ship To:

⑤ Regional Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Begin) (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Name of Carrier

Date Shipped:

Airbill Number

⑧ Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate / Other (specify)

⑨ Sample Location

⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

REGIONAL OFFICE FILE COPY

AR100161

ORGANICS TRAFFIC REPORT

Sample Number: C 1618

① Case Number:

Sample Site Name/Code:

DS-117

② SAMPLE CONCENTRATION (Check One)

✓ Low Concentration

___ Medium Concentration

③ SAMPLE MATRIX (Check One)

✓ Water

___ Soil/Sediment

④ Ship To:

5 Triangle Dr.

Research Triangle Park

Attn: NC 277

Transfer

Ship To:

⑤ Regional Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Begin) (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)	1	1/2 GAL
Water (VOA)	2	80 ml
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Name of Carrier

Date Shipped:

Airbill Number

⑧ Sample Description

___ Surface Water ___ Mixed Media

✓ Ground Water ___ Solids

___ Leachate ___ Other (specify) ______

⑨ Sample Location

WELL 3-5

⑩ Special Handling Instructions: (e.g. safety precautions, hazardous nature) 14 day turn around

If insufficient volume analyze for in the following order:

AR100162

ORGANICS TRAFFIC REPORT

U.S. ENVIRONMENTAL PROTECTION AGENCY

Sample Number: C-1621

① Case Number: [illegible]

Sample Site Name/Code: [illegible] / DE-17

② SAMPLE CONCENTRATION (Check One)

X Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX (Check One)

X Water
___ Soil/Sediment

④ Ship To: [illegible] Triangle Park, NC [illegible]

Attn:

Transfer Ship To:

⑤ Regional Office:

Sampling Personnel: [illegible] (Name)

[illegible] (Phone)

Sampling Date: 7/14/82 (Begin) (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)	1	½ GAL
Water (VOA)	2	[illegible]
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

[illegible] EXPRESS

Name of Carrier

7/14/82

Date Shipped:

[illegible]

Airbill Number:

⑧ Sample Description

___ Surface Water ___ Mixed Media
X Ground Water ___ Solids
___ Leachate ___ Other (specify) ___

⑨ Sample Location

WELL # 39

MATCHES INORGANIC [illegible] [illegible]

⑩ Special Handling Instructions: 14 day turn around
(e.g., safety precautions, hazardous nature)

[illegible] Analyze in the following order
1. Base Neutral 3. Acid Organics
2. Pesticide [illegible]

REGIONAL OFFICE FILE COPY

AR100163

ORGANICS TRAFFIC REPORT

Case Number:

Sample Site Name/Code:

Site Code

Unit

② SAMPLE CONCENTRATION
(Check One)

X Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)

X Water
___ Soil/Sediment

④ Ship To:

Attn:

Transfer
Ship To:

⑤ Regional Office: 5

Sampling Personnel:

(Name)

(Phone)

Sampling Date: 1/15

(Start) (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)	1	
Water (VOA)	2	
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Federal Express

Name of Carrier

1/15

Date Shipped:

Airbill Number:

⑧ Sample Description

___ Surface Water ___ Mixed Media
X Ground Water ___ Solids
___ Leachate ___ Other (specify)

⑨ Sample Location

Wells

Private

⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

14 day turn around
If insufficient volume analyze in the following order:
1. Base Neutrals
2. Pesticides

AR100164

ORGANICS TRAFFIC REPORT

Sample Number: C 1523

(1) Case Number:

Sample Site Name/Code:

(2) SAMPLE CONCENTRATION (Check One)
- ✓ Low Concentration
- ___ Medium Concentration

(3) SAMPLE MATRIX (Check One)
- ✓ Water
- ___ Soil/Sediment

(4) Ship To:
Mead Technology
5 Triangle Dr
Research Triangle Park
Attn: NC 27709
Transfer
Ship To:

(5) Regional Office: 3

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Begin) (End)

(6) For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)	1	1/2 gal
Water (VOA)	3	50 mL
Soil/Sediment		
Water (Ext/VOA)		
Other		

(7) Shipping Information

Name of Carrier

Date Shipped:

Airbill Number

(8) Sample Description
- ___ Surface Water
- ___ Ground Water
- ___ Leachate
- ___ Mixed Media
- ___ Solids
- ___ Other (specify)

(9) Sample Location
Rail=45

(10) Special Handling Instructions: (e.g., safety precautions, hazardous nature)
1st duty turn around
If insuff. volume please analyze in this order
1. Base Neuts 3. Acid
2. Pesticides

REGIONAL OFFICE FILE COPY

AR100165

ORGANICS TRAFFIC REPORT

U.S. ENVIRONMENTAL PROTECTION AGENCY

Sample Number: C 1624

(1) Case Number: [illegible] Sample Site Name/Code: [illegible]	(2) SAMPLE CONCENTRATION (Check One) ✓ Low Concentration ___ Medium Concentration (3) SAMPLE MATRIX (Check One) ✓ Water ___ Soil/Sediment	(4) Ship To: [illegible handwriting] Attn: Transfer Ship To:

(5) Regional Office: [illegible]

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(End)

(7) Shipping Information

Name of Carrier

Date Shipped:

Airbill Number:

(6) For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)	1	[illegible]
Water (VOA)	[illegible]	[illegible] ml
Soil/Sediment		
Water (Ext/VOA)		
Other		

(8) Sample Description

___ Surface Water ___ Mixed Media

✓ Ground Water ___ Solids

___ Leachate ___ Other (specify) ______

(9) Sample Location

Well # B4

(10) Special Handling Instructions: (e.g., safety precautions, hazardous nature) [illegible] day turn around

If insufficient volume please analyze in this order

1. Base/Neutral
2. Pesticides

AR100166

ORGANICS TRAFFIC REPORT

Sample Number: C 1625

① Case Number:

Sample Site Name/Code:

② SAMPLE CONCENTRATION (Check One)
- ✓ Low Concentration
- ___ Medium Concentration

③ SAMPLE MATRIX (Check One)
- ✓ Water
- ___ Soil/Sediment

④ Ship To:
Mead Terrell
5 Triangle Park
Research Triangle
NC 2770[illegible]
Attn:

Transfer Ship To:

⑤ Regional Office: 3
Sampling Personnel:
[illegible]
(Name)
[illegible]
(Phone)
Sampling Date: [illegible]
(Begin) (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)	[illegible]	[illegible]
Water (VOA)	[illegible]	Blank
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information
[illegible]
Name of Carrier
[illegible]
Date Shipped:
[illegible]
Airbill Number:

⑧ Sample Description
- ___ Surface Water
- ___ Ground Water
- ___ Leachate
- ___ Mixed Media
- ___ Solids
- ✓ Other (specify) Sample Blank

⑨ Sample Location
Sample Blank
[illegible]

⑩ Special Handling Instructions: (e.g. safety precautions, hazardous nature)
14 day turn around
In addition volume please analyze in this order
1. Base/Neutral
2. Pesticides

REGIONAL OFFICE FILE COPY

AR100167

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region 3 FIT
8021 Rt. 130
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO. | PROJECT NAME

SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
1166	7/11	1615		✓	[illegible]	1	[illegible] MS 7095
1167	7/12	1100		✓	[illegible]	1	" MS 7094
1168	7/12	1030		✓	[illegible]	1	" MS 7092

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[illegible]	7/12/92 1130				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

3 - 1158

AR100168

ORGANICS TRACKING REPORT

(1) Case Number:

Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)

___ Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX
(Check One)

___ Water
___ Soil/Sediment

(4) Ship To:

Attn:

Transfer
Ship To:

(5) Regional Office: _____

Sampling Personnel:

(Name)

(Phone)

Sampling Date:

(Begin) (End)

(6) For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment		
Water (Ext, VOA)		
Other		

(7) Shipping Information

Name of Carrier

Date Shipped:

Airbill Number:

(8) Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate ___ Other (specify)

(9) Sample Location

(10) Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

REGIONAL OFFICE FILE COPY

ORGANICS TRACE REPORT

Sample # C 16

① Case Number:

Sample Site Name/Code:

② SAMPLE CONCENTRATION
(Check One)
/ Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)
___ Water
___ Soil/Sediment

④ Ship To:

Attn:

Transfer
Ship To:

⑤ Regional Office:

Sampling Personnel:

(Name)

(Phone)

Sampling Date:
(Start) (End)

Shipping Information

Name of Carrier

Date Shipped:

Air Bill Number

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment		
Water (Ext, VOA)		
Other		

⑦ Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water / Solids
___ Leachate ___ Other (specify)

⑨ Sample Location

⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

REGIONAL OFFICE FILE COPY

AR100170

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region 3 FIT
6021 Rt. 130
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
[illegible]	[illegible]

SAMPLERS: *(Signature)* [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS
HC9056	7/6/82	[illegible]		X	[illegible] depth [illegible]	1	1						Tag # 2270 [illegible] organic sample [illegible]
HC9057	7/6/82	[illegible]		X	[illegible] depth [illegible]	1	1						Tag # 2272 [illegible] organic sample [illegible]

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[illegible]	7/7/82 [illegible]				
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	
				[illegible]	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

Sample Number

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
Low Concentration
Medium Concentration

(3) SAMPLE MATRIX
(Check One)
Water
Soil/Sediment

(4) Ship To:
Attn:
Transfer
Ship To:

(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
Surface Water
Ground Water
Leachate
Mixed Media
Solids
Other
(specify)
MATCHES ORGANIC SAMPLE NO.

(8) Mark Volume Level
On Sample Bottle
Check Analysis required
Task 1 & 2
Task 3 Ammonia
Sulfide
Cyanide
TOC
Fluoride & pH

REGIONAL OFFICE FILE COPY

AR100172

Sample Number

(1) Case Number:
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
— Low Concentration
— Medium Concentration

(3) SAMPLE MATRIX
(Check One)
— Water
— Soil/Sediment

(4) Ship To:
Attn:

Transfer
Ship To:

(5) Sampling Office:
Sampling Personnel:
(Name)
(Phone)
Sampling Date:
(Begin) (End)

(6) Shipping Information:
Name Of Carrier:
Date Shipped:
Airbill Number:

(7) Sample Description:
(Check One)
— Surface Water
— Ground Water
— Leachate
— Mixed Media
— Solids
— Other
(specify)
MATCHES ORGANIC SAMPLE NO.

(8) Mark Volume Level
On Sample Bottle
Check Analysis required
— Task 1 & 2
— Task 3 Ammonia
Sulfide
Cyanide
— TOC
— Fluoride & pH

REGIONAL OFFICE FILE COPY

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

EPA Region 3 TIT
6021 BL 130
Pennsauken, NJ 08110

CHAIN OF CUSTODY RECORD

PROJ. NO. | PROJECT NAME

SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by:	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by:	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

U.S. ENVIRONMENTAL PROTECTION AGENCY
EPA ASSISTANCE AGREEMENT/AMENDMENT
PART I - ASSISTANCE NOTIFICATION INFORMATION

1. ASSISTANCE ID NO.	2. LOG NUMBER
V 03299-01-0	Three-V- 4
3. JUN 25 1984	4. MAILING DATE

5. AGREEMENT TYPE		6. PAYMENT METHOD	7. TYPE OF ACTION
Cooperative Agreement	XX	☐ Advance ☐ Reimbursement ☒ Letter of Credit 68-13-0314	New
Grant Agreement		Send Payment Request To:	
Assistance Amendment			

RECIPIENT ORGANIZATION

8. RECIPIENT
Delaware Department of Natural Resources
and Environmental Control
P. O. Box 1401, 89 Kings Highway
Dover, Delaware 19903

9. PAYEE
Delaware Department of Natural Resources
and Environmental Control
P. O. Box 1401, 89 Kings Highway
Dover, Delaware 19903

EIN NO. 51-600279
CONGRESSIONAL DISTRICT Statewide
10. RECIPIENT TYPE State

11. PROJECT MANAGER AND TELEPHONE NO.
Robert J. Touhey
302/736-4764

12. CONSULTANT *(WWT Construction Grants Only)*
n/a

EPA CONTACT

13. ISSUING OFFICE *(City/State)*
Philadelphia, PA

14. EPA PROJECT/STATE OFFICER AND TELEPHONE NO.
Dominic DiGiulio
215/597-2193

15. EPA CONGRESSIONAL LIAISON & TEL. NO.	16. STATE APPL ID *(Clearinghouse)*	17. FIELD OF SCIENCE	18. PROJECT STEP *(WWT CG Only)*
Patricia Gaskins 202/382-5184	SAI 84-02-24-02	n/a	n/a

19. STATUTORY AUTHORITY	20. REGULATORY AUTHORITY	21. STEP 2 + 3 & STEP 3 *(WWT Construction Only)*	
P.L. 96-510	41 CFR Part 30	a. Treatment Level	n/a
		b. Project Type	n/a
		c. Treatment Process	n/a
		d. Sludge Design	n/a

22. PROJECT TITLE AND DESCRIPTION
Implementation of the remedial investigation and feasibility study for the Delaware Sand and Gravel hazardous waste site under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)

23. PROJECT LOCATION *(Areas Impacted by Project)*

City/Place	County	State	Congressional District
New Castle	New Castle	DE	Statewide

24. ASSISTANCE PROGRAM *(CFDA Program No. & Title)*	25. PROJECT PERIOD	26. BUDGET PERIOD
Superfund 66.802	6/15/84 - 6/14/85	6/15/84 - 6/14/85

27. COMMUNITY POPULATION *(WWT CG Only)*	28. TOTAL BUDGET PERIOD COST	29. TOTAL PROJECT PERIOD COST
n/a	$373,514	$373,514

FUNDS	FORMER AWARD	THIS ACTION	AMENDED TOTAL
30. EPA Amount This Action		$373,514	
31. EPA In-Kind Amount			
32. Unexpended Prior Year Balance			
33. Other Federal Funds			
34. Recipient Contribution			
35. State Contribution			
36. Local Contribution			
37. Other Contribution			
38. Allowable Project Cost		$373,514	

39. FISCAL

Program Element	FY	Appropriation	Doc. Control No.	Account Number	Object Class	Obligation/Deoblig. Amount
TFAY9A	84	68/20X8145	E2D057	4TFA722L45	41.83	A8300175

EPA Form 5700-20A (Rev. 5-82) Replaces previous editions and EPA Forms 5700-1A, B, C, and D, all of which are obsolete.

PART II—APPROVED BUDGET — ASSISTANCE IDENTIFICATION NO.

TABLE A – OBJECT CLASS CATEGORY (Non-construction)	TOTAL APPROVED ALLOWABLE BUDGET PERIOD COST
1. PERSONNEL	0
2. FRINGE BENEFITS	0
3. TRAVEL	1,000
4. EQUIPMENT	6,550
5. SUPPLIES	3,500
6. CONTRACTUAL (personal services)	362,464
7. CONSTRUCTION	0
8. OTHER	0
9. TOTAL DIRECT CHARGES	373,514
10. INDIRECT COSTS: RATE % BASE	0
11. TOTAL (Share: Recipient 0 %. Federal 100 %.)	$373,514
12. TOTAL APPROVED ASSISTANCE AMOUNT	$ 373,514

TABLE B – PROGRAM ELEMENT CLASSIFICATION (Non-construction)	n/a
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12. TOTAL (Share: Recipient ____ %. Federal ____ %.)	
13. TOTAL APPROVED ASSISTANCE AMOUNT	$

TABLE C – PROGRAM ELEMENT CLASSIFICATION (Construction)	n/a
1. ADMINISTRATION EXPENSE	
2. PRELIMINARY EXPENSE	
3. LAND STRUCTURES, RIGHT-OF-WAY	
4. ARCHITECTURAL ENGINEERING BASIC FEES	
5. OTHER ARCHITECTURAL ENGINEERING FEES	
6. PROJECT INSPECTION FEES	
7. LAND DEVELOPMENT	
8. RELOCATION EXPENSES	
9. RELOCATION PAYMENTS TO INDIVIDUALS AND BUSINESSES	
10. DEMOLITION AND REMOVAL	
11. CONSTRUCTION AND PROJECT IMPROVEMENT	
12. EQUIPMENT	
13. MISCELLANEOUS	
14. TOTAL (Lines 1 thru 13)	
15. ESTIMATED INCOME (If applicable)	
16. NET PROJECT AMOUNT (Line 14 minus 15)	
17. LESS: INELIGIBLE EXCLUSIONS	
18. ADD: CONTINGENCIES	
19. TOTAL (Share: Recipient ____ %. Federal ____ %.)	
20. TOTAL APPROVED ASSISTANCE AMOUNT	AR300176

EPA Form 5700-20A (Rev. 8-79)

GENERAL CONDITIONS

The recipient covenants and agrees that it will expeditiously initiate and timely complete the project work for which assistance has been awarded under this agreement, in accordance with all applicable provisions of 40 CFR Chapter I, Subpart B. The recipient warrants, represents, and agrees that it, and its contractors, subcontractors, employees and representatives, will comply with: (1) all applicable provisions of 40 CFR Chapter I, Subchapter B, INCLUDING BUT NOT LIMITED TO the provisions of Appendix A to 40 CFP Part 30, and (2) any special conditions set forth in this assistance agreement or any assistance amendment pursuant to 40 CFR 30.425.

b. SPECIAL CONDITIONS:

(For cooperative agreements include identification or summarization of EPA responsibilities that reflect or contribute to substantial involvement.)

1. EPA awards this cooperative agreement in accordance with the Federal Grant and Cooperative Agreement Act of 1977. This agreement is subject to all applicable EPA assistance regulations.

2. The recipient agrees to submit quarterly progress reports to the EPA Project Officer. These reports shall cover expenditures to date and expenditures since the previous report, estimates of work completed (as a percentage of the total work to be done on that activity) with a description of the basis for the estimates, estimated variance (cost and time) expected at project completion based on current project status, as well as an itemization of expenditures by cost category.

3. The recipient agrees to submit to Mr. Francis R. Snock, Chief, Grants Management Section, a completed EPA Form 6005-1 within 15 days after the end of each Federal fiscal quarter during which the recipient or its contractors award any subagreements to minority or women's businesses.

4. The recipient agrees to the following conditions in accepting this cooperative agreement for the letter of credit method of financing:

   a. Cash drawdowns will occur only when needed for disbursements.

   b. Timely reporting of cash disbursements and balances will be provided as required by the EPA Letter of Credit Users Manual.

   c. The same standards of timing and reporting will be imposed on secondary recipients, if any.

   d. When a drawdown under the letter of credit occurs, the recipient will show on the back of the voucher (Form TFS-5401) the Cooperative Agreement number, the appropriate EPA account number, and the drawdown amount applicable to each activity account (see attached "Instructions for Using the Superfund Account Number Under Cooperative Agreements"). The eighth digit of the account number (see item 39, page 1 of the Cooperative Agreement) is the code to the appropriate activity assignment:

      L - Remedial Planning, consisting of the following subactivities:

      - Remedial Investigation/Feasibility Study
      - Remedial Design

      R - Remedial Implementation, consisting of the following subactivities:

      - Remedial Action
      - Operation and Maintenance
      - Initial Remedial Measure

AR300177

(continued)

4. (continued)

   e. When funds for a specific activity have been exhausted but the work under the activity has not been completed, the recipient may not drawdown from another activity or site account without written permission from the EPA Project Officer and Award Official.

   f. Funds remaining in an account after completion of an activity may either be returned to the EPA or adjusted to another activity or site at EPA's discretion.

   g. When a subactivity is completed, the recipient will submit a Financial Status Report (Standard Form 269) within 90 days to Mr. Francis R. Snock, Chief, Grants Management Section.

   Failure on the part of the recipient to comply with the above conditions may cause the unobligated portions of the letter of credit to be revoked and the financing method changed to a reimbursable basis.

   Federal funds will be released to the recipient utilizing the letter of credit payment method. The entire amount awarded will be released upon receipt by EPA of the signed Assistance Agreement.

5. The recipient agrees to submit a detailed estimate of personnel costs to EPA prior to the commencement of site activities.

6. The recipient agrees to submit a site-specific Quality Assurance Plan for EPA approval prior to commencement of any field activities such as sampling and well drilling. The recipient, with EPA's assistance, will incorporate EPA's current Quality Assurance Requirements in the plan.

CONDITIONS (Continued)

PART IV

NOTE: The Agreement must be completed in duplicate and the Original returned to the Grants Administration Division for Headquarters awards and to the appropriate Grants Administrations Office for State and local awards within 3 calendar weeks after receipt or within any extension of time as may be granted by EPA.

Receipt of a written refusal or failure to return the properly executed document within the prescribed time, may result in the withdrawal of the offer by the Agency. Any change to the Agreement by the recipient subsequent to the document being signed by the EPA Award Official which the Award Official determines to materially alter the Agreement shall void the Agreement.

OFFER AND ACCEPTANCE

The United States of America, acting by and through the U.S. Environmental Protection Agency (EPA), hereby offers assistance/~~amendment~~ to the Delaware Department of Natural Resources and Environmental Control (RECIPIENT ORGANIZATION) for 100 % of all approved costs incurred up to and not exceeding $ 373,514 (ASSISTANCE AMOUNT) for the support of approved budget period effort described in application *(including all application modifications)* Remedial Investigation & Feasibility Study/Delaware Sand & Gravel (DATE AND TITLE) included herein by reference.

ISSUING OFFICE *(Grants Administration Office)*	AWARD APPROVAL OFFICE
ORGANIZATION/ADDRESS Grants Management Section (3PM32) U. S. EPA, Region III Curtis Building, 6th and Walnut Streets Philadelphia, Pennsylvania 19106	ORGANIZATION/ADDRESS Regional Administrator (3RA00) U. S. EPA, Region III Curtis Building, 6th and Walnut Streets Philadelphia, Pennsylvania 19106

THE UNITED STATES OF AMERICA BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY

SIGNATURE OF AWARD OFFICIAL	TYPED NAME AND TITLE	DATE
[signature]	Thomas P. Eichler, Regional Administrator	JUN 27 1984

This Agreement is subject to applicable U.S. Environmental Protection Agency statutory provisions and assistance regulations. In accepting this award or amendment and any payments made pursuant thereto, (1) the undersigned represents that he is duly authorized to act on behalf of the recipient organization, and (2, the recipient agrees (a) that the award is subject to the applicable provisions of 40 CFR Chapter I, Subchapter B and of the provisions of this agreement (Parts I thru IV), and (b) that acceptance of any payments constitutes an agreement by the payee that the amounts, if any found by EPA to have been overpaid will be refunded or credited in full to EPA.

BY AND ON BEHALF OF THE DESIGNATED RECIPIENT ORGANIZATION

SIGNATURE	TYPED NAME AND TITLE	DATE
[signature]	John E. Wilson, III	16 July 84

for Holly 7/16/84

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

JUL 3 1984

CERTIFIED MAIL

Re: V-003299-01
Delaware Department of Natural
Resources and Environmental Control

Honorable John E. Wilson, III, Secretary
Department of Natural Resources and
Environmental Control
89 Kings Highway
P.O. Box 1401
Dover, Delaware 19901

Dear Mr. Wilson:

I am pleased to inform you that I have approved your application and an award of $373,514 under the Comprehensive Environmental Response, Compensation and Liability Act of 1980. This award is for the implementation of the remedial investigation and feasibility study for the Delaware Sand and Gravel hazardous waste site.

This award is made subject to the terms and conditions of the enclosed Assistance Agreement. The original copy of the agreement should be signed and returned to Mr. Frank Snock, Chief, Grants Management Section, within twenty-one days of your receipt. The copy should also be signed and retained for your files.

If any additional assistance is required, please contact your EPA Program Manager, Mr. Dominic DiGiulio, at 215/597-2193.

Sincerely,

Thomas P. Eichler
Regional Administrator

Enclosure

3 AR300180

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
P. O. BOX 1401
DOVER, DELAWARE 19901

OFFICE OF THE
SECRETARY

TELEPHONE: (302) 736 - 4403

July 16, 1984

Mr. Frank Snock
Chief, Grants Management Section
U.S. Environmental Protection Agency
Region III
6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Dear Mr. Snock:

Enclosed you will find the signed Assistance Agreement for the remedial investigation and feasibility study for the Delaware Sand and Gravel hazardous waste site.

We are looking forward to the opportunity to participate in the C.E.R.C.L.A. program as a state lead management action. Thank you for the attention you've given this matter.

Should you require any further assistance, please contact Ms. Marilyn Plitnik of our Water Supply Branch at (302) 736-5739.

Sincerely,

John E. Wilson, III
Secretary

JEW/MAP/ks

Enclosure

cc: Marilyn A. Plitnik
Thomas P. Eichler

Amendment #1
Award Document

U.S. ENVIRONMENTAL PROTECTION AGENCY

ASSISTANCE AMENDMENT

(Optional)

(Please read instructions on reverse)

ASSISTANCE I.D. NO. V-003299-01

AMENDMENT NO. 2

NOTE: The original Amendment with one copy must be executed and returned to the Grants Administration Division for Headquarters assistance awards and to the Grants Administration Branches for State and local assistance awards within 3 weeks after receipt or within any extension of time as may be granted in writing by EPA. Except as may be otherwise provided, no costs as a result of the Amendment may be incurred prior to the execution of the Assistance Amendment by the parties thereto.

Receipt of a written refusal, or failure to receive the properly executed document within the prescribed time will result in the termination of consideration of the Assistance Amendment by EPA.

GENERAL INFORMATION

APPROPRIATION AND ACCOUNTING DATA

APPROPRIATION NUMBER	ACCOUNT NUMBER	OBJECT CLASS CODE
68-20X8145	5TFA03RL45	41.85 DCN: V85014

DESCRIPTION OF AMENDMENT. PURSUANT TO EPA ASSISTANCE REGULATION 40 CFR 30.900 "PROJECT CHANGES AND ASSISTANCE MODIFICATIONS" AND 40 CFR 30.900-1 "FORMAL ASSISTANCE AMENDMENTS," THE ABOVE NUMBERED ASSISTANCE AGREEMENT IS AMENDED AS FOLLOWS.

A. The EPA Award amount is hereby increased by $385,527, from $373,514 to $759,041, utilizing FY-85 funds. This amendment is for the remedial investigation and feasibility study at Delaware Sand and Gravel hazardous waste site.

B. The approved allowable budget categories are as follows:

Personnel	$ 17,940
Fringe Benefits	3,947
Travel	1,000
Equipment	6,550
Supplies	3,500
Contractual	722,598
Construction	0
Other	0
Total Direct Charges	755,535
Indirect Charges	3,506
Total (Share: Recipient 0 Federal 100%)	$759,041
Total Approved Assistance Amount	$759,041

AWARD APPROVAL OFFICE	ISSUING OFFICE
ORGANIZATION: Regional Administrator (3RA00)	ORGANIZATION: Grants Management Section (3PM32)
ADDRESS: U. S. EPA, Region III 841 Chestnut Building Philadelphia, Pennsylvania 19107	ADDRESS: U. S. EPA, Region III 841 Chestnut Building Philadelphia, Pennsylvania 19107

RECIPIENT ORGANIZATION

NAME	ADDRESS
Delaware Department of Natural Resources and Environmental Control	P. O. Box 1401 89 Kings Highway Dover, Delaware 19903

Except as provided herein all terms and conditions of the basic assistance agreement, including prior amendments, remain unchanged and in full force and effect and subject to all applicable provisions of 40 CFR Chapter 1, Subpart B.

THE UNITED STATES OF AMERICA BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY

SIGNATURE OF AWARD OFFICIAL	TYPED NAME AND TITLE	DATE
	James M. Seif, Regional Administrator	SEP 27 1985

BY AND ON BEHALF OF THE DESIGNATED RECIPIENT ORGANIZATION

SIGNATURE	TYPED NAME AND TITLE	DATE
	John E. Wilson, III, Secretary	October 15, 1985

EPA Form 5700-20B (Rev. 11-79) PREVIOUS EDITION IS OBSOLETE.

AR 060182

AR3001R2

C. The approved allowable budget period cost of $759,041 includes:

1. Non-Federal funds of $-0-
2. Federal FY-84 funds of $373,514 previously awarded
3. Federal FY-85 funds of $385,527 being awarded by this amendment.

D. The Assistance Agreement is hereby amended by adding the following special condition:

8. A provisional indirect cost rate of 19.54% has been budgeted in this Assistance Agreement, but is subject to a renegotiated rate by the cognizant Federal agency or at final audit.

All other terms and conditions remain unchanged.

AMENDMENT NUMBER 1
TO
CONTRACT FOR PERSONAL SERVICES
CONTRACT NUMBER CERCLA 85-1
DATED OCTOBER 25, 1984

The above referenced contract between the Delaware Department of Natural Resources and Environmental Control and Dunn Geoscience Inc. is amended as follows:

By deleting Paragraph 6, Effective Date and Time of Performance, thereof in its entirety and insert in lieu thereof the following:

6. Effective Date and Time of Performance.

The services of the CONTRACTOR are to commence as soon as practicable after the execution of this Contract and shall be undertaken and completed in such sequence as to assure their expeditious completion in the light of the purposes of this Contract, but in any event all of the services required hereunder shall be completed no later than August 30, 1985, unless extended by Formal Amendment to this Contract. Final reports shall be delivered on the completion date specified above. The Contractor agrees to pay the Department liquadated damages in the amount of fifty dollars for each day the final report is late, which amount may be withheld by the Department from any final payment.

IN WITNESS WHEREOF, the Department and the Contractor have executed this Amendment to be effective as of the 8th day of November 1984.

DEPARTMENT OF NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

BY: _____

ATTEST: _____

DUNN GEOSCIENCE INC.

BY: _____

ATTEST: Edna M. Harrington

AR100184

AMENDMENT NUMBER 2
TO
CONTRACT FOR PERSONAL SERVICES
CONTRACT NUMBER CERCLA 85-1
DATED OCTOBER 25, 1984

The above referenced contract between the Department of Natural Resources and Environmental Control and Dunn Geoscience, Inc. is hereby amended as follows:

A. By amending paragraph 7a. by deleting the amount "Two Hundred Eighty-seven Thousand Seven Hundred Twenty-six Dollars ($287,726)" and inserting in lieu thereof the amount of "Two Hundred Ninety-two Thousand One Hundred Sixty-one Dollars ($292,161)".

B. By amending paragraph 8a. by deleting the amount "$258,953" and inserting in lieu thereof the amount of "$262,945".

C. By amending paragraph 8b. by deleting the amount "$28,773" and inserting in lieu thereof the amount of "$29,216".

D. By amending Task 8 of Attachment A, Scope of Services, by adding the following to the end thereof: "A location map shall be prepared which encompasses both the Delaware Sand and Gravel and Army Creek landfills. Major roads, railways, streams, and landmarks shall be shown on the location map. Monitoring wells and public and industrial water supply wells shall also be shown on the location map. The location map shall be prepared by tracing an enlargement of an existing map or aerial photograph".

E. By deleting Task 8 of Attachment B in its entirety and substituting in lieu thereof the following:

Task 8 Prepare Topographic and Location Maps

A topographic map and a location map shall be prepared for the Delaware Sand and Gravel remedial investigation and feasibility study. The topographic map shall be site specific, encompassing the site and a small area immediately surrounding the site. The location map shall encompass both the Delaware Sand and Gravel and the Army Creek landfills. Major roads, railways, streams, and landmarks shall be plotted on the location map. Monitoring wells and public and industrial water supply wells shall also be plotted on the location map.

The topographic map shall be prepared in accordance with Attachment A of this contract. The location map shall be prepared by tracing an enlargement of an existing map or aerial photo. A reproducible mylar copy of both of these maps shall be delivered to the Department upon task completion.

IN WITNESS WHEREOF, The Department and the Contractor have executed this Amendment to be effective as of the 15th day of January 1985.

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

By: _____

Attest: _____

DUNN GEOSCIENCE, INC.

By: _____

Attest: _____

AR100186

AMENDMENT NUMBER 3
TO
CONTRACT FOR PERSONNEL SERVICES
CONTRACT NUMBER CERCLA 85-1
DATED OCTOBER 25, 1984

The above referenced contract between the Delaware Department of Natural Resources and Environmental Control and Dunn Geoscience, Inc. is amended as follows:

By amending paragraph 6 thereof by deleting the date "August 30, 1985" and inserting in lieu thereof the date "October 30, 1985". All other provisions of paragraph 6 shall remain in force and are not affected by this amendment.

IN WITNESS WHEREOF, the CONTRACTEE and the CONTRACTOR have executed this amendment to be effective as of the 30th day of August, 1985.

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

BY: _____

ATTEST: _____

DUNN GEOSCIENCE, INC.

BY: _____ Pres.

ATTEST: _____

AMENDMENT NUMBER 4
TO
CONTRACT FOR PERSONAL SERVICES
CONTRACT NUMBER CERCLA 85-1
DATED OCTOBER 25, 1984

WHEREAS, the remedial investigation undertaken by the contractor pursuant to this contract has revealed the need to collect much more information than originally anticipated in order to characterize the nature and extent of contamination of the Delaware Sand and Gravel landfill and assess the possible effects on human health and the environment.

WHEREAS, another amendment to the original contract was necessary to incorporate the extensive additional work required.

WHEREAS, Attachments A and B to this amendment have been amended to reflect new and additional work not covered by Attachments A and B to the original contract.

Now therefore by mutual assent of the parties, the above referenced contract as previously amended is further amended as follows:

By adding to line 2, page 1, after the words "Dunn Geoscience Corporation" the following: ", a New York corporation licensed to do business in Delaware".

By adding the following to the end of paragraph 1, Employment of Contractor: "and grant number V-003299-01-2.".

By deleting the following words from paragraph 3, Scope of Services "Attachments A and B" and inserting in lieu thereof: "Amended Attachments A and B".

By amending paragraph 6, Effective Date and Time of Performance: to change the completion date from "October 30, 1985" to "November 30, 1986".

By deleting from paragraph 7, Total Cost and Compensation, the following: "Two Hundred Ninety-two Thousand One Hundred Sixty-one Dollars ($292,161)" and inserting in lieu thereof "Five Hundred Forty-two Thousand One Hundred and Five Dollars ($542,105).

By amending paragraph 8 a. by deleting the amount "$262,945" and inserting in lieu thereof the amount of "$487,895" and by adding the word "Amended" before Attachments A and B.

By amending paragraph 8 b. by deleting the amount "$29,216" and inserting in lieu thereof "$54,210".

By adding a new paragraph as follows:

"23. Prohibition of Contingent Fees. The CONTRACTOR swears it has not employed or retained any company or person, other than a bona fide employee working primarily for the CONTRACTOR, to solicit or secure this agreement, and that it has not paid or agreed to pay any person, company, corporation, individual or firm, other than a bona fide employee working primarily for the CONTRACTOR, any fee, commission, percentage, gift or any other consideration, contingent upon or resulting from the award or making of this agreement. For breach or violation of this section, the DEPARTMENT

shall have the right to terminate the contract without liability and, at its discretion, to deduct from the contract price, or otherwise recover, the full amount of such fee, commission, percentage, gift, or consideration."

By adding a new paragraph as follows:

"24. Notwithstanding other terms and conditions of this contract, it is understood and agreed that the total cost and compensation hereunder shall not exceed the funds made available to the State of Delaware by U. S. Environmental Protection Agency for this project."

By deleting "Attachment A" and "Attachment B" in their entirety and substituting in lieu thereof "Amended Attachment A" and "Amended Attachment B" in their entirety.

All terms and conditions of Contract Number CERCLA 85-1 not heretofore or hereby amended shall remain in full force and effect.

IN WITNESS WHEREOF, the Department of Natural Resources and Environmental Control and the Contractor have executed this Amendment to be effective as of the 1st day of January 1986, provided that a valid executed purchase order has been approved by the Secretary of Finance.

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

BY: _____

ATTEST: _____

DUNN GEOSCIENCE INC.

BY: _____

ATTEST: _____

Technical Progress Report

Delaware Sand and Gravel Landfill

RI/FS

November 1984

During the month of November, 1984, work has been performed on 10 of the tasks defined in the Department scope of work in contract No. CERCLA 85-1. Initial actions have been taken to schedule work activities, collect literature, define the Health and Safety and Quality Assurance protocols, set up the forms for reporting to the State, and to set up data files on computers. The specific tasks addressed during November include tasks 2, 3, 4, 5, 8, 9, 11, 15, 17 and 24. Details describing the work performed per task are provided below:

Task 2 - Health and Safety Plan

The State of Delaware Health and Safety Plan for RCRA remedial actions was reviewed. The State plan, with minor additions, was considered adequate by Dunn Geoscience. The additions to the State plan were detailed in an addendum which was delivered to the Department on Monday, November 19, 1984. The Department and EPA Region 3 reviewed the plan during the week of November 19th. Verbal approval of the Delaware Sand and Gravel Health and Safety Plan for the Dunn Geoscience RI/FS activities was provided by Steve Young on Monday, November 26, 1984. Written notification of the approval has not been received as of November 30, 1984.

Sixty-nine percent (69%) of this task has been completed as of November 30, 1984. Review of the safety plan by Dunn personnel and written approval from the State are anticipated. This task will be completed in December.

Task 3 - Quality Assurance Plan

The State of Delaware Quality Assurance (QA) Plan was reviewed during the week of November 19, 1984. The State QA Plan, with some changes, was deemed adequate by Dunn Geoscience. The changes to the State plan were detailed in an addendum prepared by Dunn Geoscience. This addendum was Federal Expressed to Steve Young on Monday, November 26, 1984. This modified plan is being reviewed by the Department and EPA Region 3. Comments on the modified QA plan are anticipated before Tuesday, December 11, 1984.

Eighty-five percent of this task has been completed as of November 30, 1984. This QA plan must be reviewed by the State Laboratory personnel and any Department modifications must be incorporated. This task should be completed in December.

Task 4 - Collect and Evaluate Existing Data

This task was begun the week after the contract between the Department and Dunn was signed (November 12 - 16). All in-house information was collected and reviewed. Appointments were scheduled to review Department files and Delaware Geological Survey (DGS) files during the week of November 19 through 21 (Thanksgiving week). W.J. Miller and P.W. Hare reviewed the Department files on November 19 and 21 and DGS files on November 21. Much information was collected. All the literature and data collected are being compiled (during the week of November 26 - 30, and ongoing). An appointment was scheduled with Dom DeGuiglio, EPA Region 3, to peruse EPA files on Tuesday, December 4, 1984.

A reference list of all reports and key memos and letters has been and will continue to be prepared by Dunn Geoscience. This reference list is attached for Department and EPA review. It is anticipated that any key references missing from the Dunn Geoscience reference list will be identified by the Department or EPA.

In the compilation of existing data, it was apparent that water level and pumpage data are readily available for the years prior to 1980. The most recent water level and pumpage data are not readily available in the reports and files Dunn Geoscience personnel (Miller and Hare) reviewed. Water-quality data prior to 1980 is available on a scattered basis. Summaries and continuous-time plots (1973 to present) of water quality are not available in the reports and files Dunn Geoscience personnel reviewed. Much, if not all, of this information was collected specifically for the Army Creek Landfill studies. These data are necessary to completely evaluate the Delaware Sand and Gravel Landfill. Much of the data Dunn Geoscience requires should be readily available from New Castle County (NCC) or Roy F. Weston. Since the data are probably on computer files, it would be preferable to obtain a magnetic tape of all the Army Creek water levels, pumpages, and water quality. In a verbal conversation with Steve Young, W.J. Miller requested the Department obtain the Army Creek data from NCC or Weston, or to allow Dunn personnel to contact the County directly. As of November 30, 1984, Dunn has not obtained Army Creek data from the NCC or Weston, nor has permission been granted to directly contact NCC.

Data concerning 1980 to present pumpages, water levels, and water quality for Artesian and Amoco wells should be available from the Department. However, this information was not in the Department's Army Creek or Delaware Sand and Gravel Superfund files.

It is anticipated that more data will be collected. All data will be summarized and plotted (either contour plots or x-y plots). Trends concerning water quality and water levels will be evaluated statistically. Thirty-seven percent (37%) of this task has been completed as of November 30, 1984.

This task is running behind the CPM scheduled data of completion. It should be completed in December. The delay in this task delays Task 15, the model. Information is required from New Castle County. Permission for Dunn to contact the County directly is being considered by the Department.

Task 5 - Site Survey and Surface Geophysics

The preliminary site survey was scheduled for Monday, December 3, 1984. The Dunn Geoscience personnel available to attend the meeting are:

William E. Cutcliffe, CPG	Project Director
William J. Miller III	RI Project Manager
Paul W. Hare	On-Site Geologist
James P. Behan, P.E.	FS Project Manager
Sander I. Bonvell	Project Chemist
William J. Hall	Engineering Geologist

It is anticipated that Department and EPA Region personnel will be present at the site survey. The site will be inspected and potential monitoring sites selected.

The surface geophysics has been scheduled for the week of December 17, 1984.

Two percent (2%) of this task has been completed as of November 30, 1984.

This task was scheduled earlier than as described on the Project CPM chart. This speed-up in the schedule is to avoid performing geophysics during Christmas week. Task 5 should be completed one week ahead of the CPM scheduled date of completion.

Task 8 - Topographic Mapping

Data Reduction Services has been contacted and a flight for aerial photographs has been scheduled for sometime in December (weather dependent). Ground controls will be established prior to the flight by Richardson personnel.

Less than one percent (1%) of this task has been completed as of November 30, 1984. This task is on schedule and should be completed in January.

Task 9 - Mobilize Field Equipment

Arrangements were made to have a construction/office trailer delivered to the site on Wednesday, December 5, 1984. The trailer is being leased from Hale Trailer and Truck Equipment of Marlton, New Jersey.

Disposable safety equipment was obtained for the site visit and for subsequent work at the site. This equipment includes disposable coveralls, gloves, paper towels, and boots. This equipment will be billed on a usage basis.

Nine percent (9%) of this task has been completed as of November 30, 1984.

This task is being performed in accordance with the CPM schedule.

Task 11 - Ground Survey

The ground survey of the grid and baseline has been scheduled for the week of December 10, 1984. The grid pattern, intended for easy identification of soil sampling and other monitoring locations, will also be used during the surface geophysics. Richardson personnel will set up the grid and baseline.

Less than one percent (1%) of this task has been completed as of November 30, 1984.

The grid and baseline survey has been moved up in the project schedule to accomodate the geophysical survey. The grid and baseline should be completed during the week of December 17th. The elevations and location surveys for monitoring points will be performed after Task 10.

Task 15 - Model Preparation

The USGS report describing the Martin Quasi-3D model has been reviewed. The input data for the Miller 2D flow model has been put on the Dunn Geoscience computer and is currently being modified. Data from 1978 to the present must be made available to Dunn before the Miller model can be completely updated.

Anticipated actions include updating the Miller flow model to match present data and using input data from the updated Miller 2D flow model in the development of the transport model.

This task is slightly behind schedule because of the lack of readily available pumpages, water levels, and water-quality data from 1978 to the present. This information should be available from the County or Weston.

Task 17 - Progress Reports and Meetings

This document is the first progress report for contract No. CERCLA 85-1. This report details work and expenditures for the month of November, 1984.

Less than one percent (1%) of this task has been completed as of November 30, 1984.

This task is on schedule.

Task 24 - Final Report

Map preparation was started for use during the project. The maps that will be prepared will be used in the final report to highlight special features and sampling points.

Two percent (2%) of this task has been completed as of November 30, 1984.

This task is ahead of schedule. Maps and figures for early reporting are being prepared.

REFERENCES

Adams, J.K., and Boggess, D.H., 1964, Water-Table, Surface-Drainage, and Engineering Soils Map of the Wilmington Area, Delaware: U.S. Geological Survey, Hydrologic Investigations Atlas HA-79.

Anonymous, ? , Evaluation of Ground Water Availability and Pumping Capacity, Llangollen Area: 4 pages.

Apgar, M.A., 1975, We Can't Afford to Let This Happen Again: Delaware Conservationist, Vol. 19, No. 2, pp. 19-21.

Apgar, M.A., and Satterthwait, W.B., 1972, Preliminary Investigation of Ground Water Contamination Associated with the Llangollen Landfill, New Castle County, Delaware: Roy F. Weston, Inc., 33 pages.

Avisun Corporation, ? , Report of Ground Water Investigation, Avisun Plant, New Castle, Delaware.

Back, W., 1966, Hydrochemical Facies and Ground-Water Flow Patterns in Northern Part of Atlantic Coastal Plain: U.S.G.S. Prof. Paper 498-A, 42 p.

Back, W., and Cherry, J.A., 1976, Chemical Aspects of Present and Future Hydrogeologic Problems: Adv. in Groundwater Hydrology, p. 153-172.

Baedecker, M.J., and Apgar, M.A., 1982, Hydrogeochemical Studies at a Landfill in Delaware: Dept. of Natural Resources and Environmental Control, Water Resources Section.

Baedecker, M.J., and Back, W., 1979, Hydrogeological Process and Chemical Reactions at a Landfill: Ground Water, Vol. 17, No. 5, p. 429-437.

Boggess, D.H., and Coskery, O.J., 1955, Water Levels and Artesian Pressures in Delaware, 1953: Delaware Geological Survey, Water-Level Report No. 2, 10 p.

Clark, D., 1979, Analysis of Army Creek Landfill Contamination Problem, Newark, Delaware: M.S. Civil Eng. Thesis, Univ. of Delaware, 120 p.

Coskery, O.J., 1961, Water Levels in Delaware, 1958: Delaware Geological Survey, Water-Level Report No. 7, 17 p.

Coskery, O.J., 1961, Water Levels in Delaware, 1957: Delaware Geological Survey Water-Level Report No. 6, 22 p.

Coskery, O.J., 1960, Ground Water Levels in the United States, 1956-57: U.S.G.S. Water Supply Paper 1537, p. 9-15.

Coskery, O.J., and Boggess, D.H., 1956, Water Levels and Artesian Pressures in Observation Wells in the United States: U.S.G.S. Water Supply Paper 1321, p. 13-22.

Coskery, O.J., and Boggess, D.H., 1956, Water Levels and Artesian Pressures in Delaware, 1959: Delaware Geological Survey, Water-Level Report No. 3, 10 p.

Coskery, O.J., 1956, Water Levels and Artesian Pressures in Delaware, 1955: Delaware Geological Survey Water-Level Report No. 4, 9 p.

Coskery, O.J., and Rasmussen, W.C., 1958, Water Levels in Delaware, 1956: Delaware Geological Survey, Water-Level Report No. 5, 21 p.

Delaware River Basin Commission, 1982, Special Ground Water Study, Basinwide Report and Executive Summary.

Delaware Interstate Highway Division, 1962, Proposed Second Structure for the Delaware Memorial Bridge, Report on Engineering Studies and Cost Estimates: Howard, Needles, Temmen & Bergendoff, Consulting Engineers, 96 p.

Dept. of Natural Resources and Environmental Control, 1975, Water Resources Framework: 56 p.

Dept. of Natural Resources and Environmental Control, Water Supply Branch, 1978, Public Water Systems in Delaware: 89 p.

DeWalle, F.B., and Chian, E.S.K., 1981, Detection of Trace Organics in Well Water Near a Solid Waste Landfill: J. of the Amer. Water Works Assoc., p. 206-211.

Ecology and Environment, Inc., 1982, Hydrologic Survey of Army Creek Landfill and Delaware Sand and Gravel Landfill: USEPA Contract No. 68-01-6056.

Ecology and Environment, Inc., 1982, Well Drilling at Delaware Sand and Gravel Landfill, New Castle, Delaware: USEPA Contract No. 68-01-6056.

Geraghty & Miller, Inc., 1982, Evaluation of the Recovery-Well System for the Llangollen Landfill, New Castle County, Delaware, a Report to the Artesian Water Company: Geraghty & Miller, Inc., Ground-Water Consultants, 28 p.

Geraghty & Miller, Inc., 1973, Evaluation of the Ground-Water Conditions in the Llangollen Well Field Artesian Water Company, Newport, Delaware: Geraghty & Miller, Inc., Consulting Ground-Water Geologists, 21 p.

Geraghty & Miller, Inc., 1973, Occurrence of Chlorides in the Shallow Artesian Aquifer, Avisun Corporation, New Castle, Delaware: Geraghty & Miller, Inc., 18 p.

Johnson, R.H., 1973, Hydrology of the Columbia (Pleistocene) Deposits of Delaware: An Appraisal of a Regional Water-Table Aquifer: Delaware Geological Survey Bull. 14, 78 p.

Jordan, R.R., and Talley, J.H., 1976, Columbia Deposits of Delaware: Delaware Geological Survey, Open File Report No. 8, 49 p.

Jordan, R.R., 1968, Observations on the Distributions of Sands within the Potomac Formation of Northern Delaware: Southeastern Geology, Vol. 9, No. 2.

Jordan, R.R., 1964, Columbia (Pleistocene) Sediments of Delaware: Delaware Geological Survey, Bull. No. 12, 69 p.

Jordan, R.R., 1963, Configuration of the Cretaceous - Tertiary Boundary in the Delmarva Peninsula and Vicinity: Southeastern Geology, Vol. 4, No. 4, p. 187-198.

Jordan, R.R., 1962, Planktonic Foraminifera and the Cretaceous Tertiary Boundary in Central Delaware: Delaware Geological Survey Report of Investigations No. 5, 13 p.

Lakshman, B.T., 1981, Is it Feasible to Clean the Aquifer Once it is Contaminated by Landfill Leachate?: Quality of Groundwater, Proceedings of an International Symposium, The Netherlands, Studies in Environmental Science, Vol. 17.

Legette, R.M., 1961, Groundwater Conditions in the Vicinity of the Avisun Plant Near New Castle, Delaware: Leggette, Brashears & Graham, Consulting Ground-water Geologists.

Liu, A.A., and Stoufer, R., 1976, Report on Statistical Analysis of Groundwater Quality Data From the Vicinity of Llangollen Landfill: DNREC Interoffice Memorandum, March 10, 1976.

Marine, I.W., 1955, Water Levels and Artesian Pressures in Observation Wells in the United States, 1952: U.S.G.S. Water Supply Paper 1221, p. 11-18.

Marine, I.W., and Rasmussen, W.C., 1954, Water Levels and Artesian Pressures in Observation Wells in the United States, 1951: U.S.G.S. Water Supply Paper 1191, p. 11-16.

Marine, I.W., 1954, Water Levels and Artesian Pressures in Delaware, 1952: Delaware Geological Survey, Water-Level Report No. 1, 11 p.

Martin, M.M., 1984, Simulated Ground-Water Flow in the Potomac Aquifer, New Castle County, Delaware: U.S.G.S. Water-Resources Investigations Report 84-4007, 85 p.

Martin, M.M., and Denver, J.M. 1982, Hydrologic Data for the Potomac Formation in New Castle County, Delaware: U.S.G.S. Water-Resources Investigations Open-File Report 81-916, 148 p.

Miller, W.J., 1982, An Analysis and Computer Simulation of the Ground Water Flow in the Vicinity of Army Creek, New Castle County, Delaware: M.S. Civil Eng. Thesis, Univ. of Delaware, 228 p.

Miller, W.J., and Silka, L.R., 1981, Application of Computer Modeling for the Investigation of Ground-Water Contamination: Proceedings of the Fourth Annual Madison Conference of Applied Research and Practice on Municipal and Industrial Waste, Madison, Wisconsin, p. 361-382.

Miller, J.C., 1971, Ground-Water Geology of the Delaware Atlantic Seashore: Delaware Geologic Survey, Report of Investigations No. 17, 33 p.

NUS Corporation, 1983, Remedial Action Master Plan - Delaware Sand and Gravel Landfill, New Castle County, Delaware: NUS Project No. 0701.05, USEPA Work Assignment No. 01-3V34.0, Contract No. 68-01-6699.

NUS Corporation, 1983, Work Plan - Initial Remedial Measures and Remedial Investigation/Feasibility Study, Delaware Sand and Gravel Landfill Site, New Castle County, Delaware: NUS Project No. 0701.05, USEPA Work Assignment No. 01-3V34.0, Contract No. 68-01-6699.

Parker, G.G., Hely, A.G., Keighton, W.S., Olmsted, F.H., and others, 1964, Water Resources of the Delaware River Basin: U.s.G.S. Professional Paper 381.

Rima, D.R., Coskery, O.J., and Angerson, P.W., 1964, Ground-Water Resources of Southern New Castle County, Delaware: U.S.G.S. Water-Supply Paper 1756, 52 p.

Spoljaric, N., 1983, Delaware Geological Survey Atlas: Delaware Geological Survey.

Spoljaric, N., and Crawford, W.A., 1979, Removal of Metals From Laboratory Solutions and Landfill Leachate by Greensand Filters: Delaware Geological Survey, Report of Investigations No. 32, 30 p.

Spoljaric, N., and Woodruff, K.D., 1970, Geology, Hydrology, and Geophysics of Columbia Sediments in the Middletown-Odessa Area, Delaware: Delaware Geological Survey Bull. 13, 156 p.

Spoljaric, N., 1967, Pleistocene Channels of New Castle County, Delaware: Delaware Geological Survey, Report of Investigations No. 10, 15 p.

Spoljaric, N., 1967, Quantitative Lithofacies Analysis of Potomac Formation, Delaware: Delaware Geological Survey, Report of Investigations No. 12, 26 p.

Sundstrom, R.W., 1974, Water Resources in the Vicinity of a Solid Waste Landfill in the Midvale-Llangollen Estates Area, New Castle County, Delaware: Univ. of Delaware, Water Resources Center, 92 p.

Sundstrom, R.W., and Pickett, T.E., 1971, The Availability of Ground Water in New Castle County, Delaware: Univ. of Delaware, Water Resources Center, 156 p.

Sundstrom, R.W., and others, 1967, The Availability of Ground Water From the Potomac Formation in the Chesapeake and Delaware Canal Area, Delaware: Univ. of Delaware, Water Resources Center, 95 p.

Talley, J.H., 1978, Ground-Water Levels in Delaware, July, 1966 - December, 1977: Delaware Geological Survey, Report of Investigations No. 30, 50 p.

Thomas, A., Leis, W.M., and Clark, D., 1978, Physical and Chemical Rehabilitation of Contaminent Recovery Wells Army Creek Landfill, New Castle County, Delaware: Roy F. Weston, Inc., 10 p.

Upson, J.E., 1966, Relationships of Fresh and Salty Ground Water in the Northern Atlantic Coastal Plain of the United States: U.S.G.S. Professional Paper 550-C, p. C-235 - C-243.

Roy F. Weston, Inc. 1983, New Castle County, Army Creek Landfill, New Recovery Wells Pump Test: Roy F. Weston, Inc., West Chester, Pennsylvania, 19 p.

Roy F. Weston, Inc., ? , Relocation of Leachate Recovery Wells, Army Creek Landfill, New Castle County, Delaware: Roy F. Weston, Inc., 25 p.

Roy F. Weston, Inc., ? , Interim Report, Llangollen Landfill Treatment Alternatives: Roy F. Weston, Inc., 15 p.

Roy F. Weston, Inc., 1976, Control Program for Leachate Affecting a Multiple Aquifer System Army Creek Landfill, New Castle County, Delaware: Roy F. Weston, Inc., 18 p.

Roy F. Weston, Inc., 1974, Preliminary Feasibility Study, Leachate Control Strategies for Llangollen Landfill, New Castle County, Delaware: Roy F. Weston, Inc., 59 p.

Roy F. Weston, Inc., 1973, Ground Water Contamination Associated With the Llangollen Landfill, New Castle County, Delaware, Extent of Contamination and Proposed Corrective Procedures: Roy F. Weston, Inc., 12 p.

Williams, P.M., 1978, Geohydrology of the Upper Potomac in Northeastern New Castle County, DNREC Interoffice Memorandum, July 19, 1978.

Woodruff, K.D., 1984, Geohydrology of the Wilmington Area: Delaware Geological Survey, Hydrologic Map Series, No. 3, 3 Sheets.

Woodruff, K.D., 1984, Geohydrology of the Newark Area: Delaware Geological Survey, Hydrologic Map Series, No. 2, 3 Sheets.

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log

Photo #1

DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
7/14/82/1030
BY C. K. LEE

WATER SAMPLING AT THE MONITORING WELL B-4

C. K. Lee

Photo #17

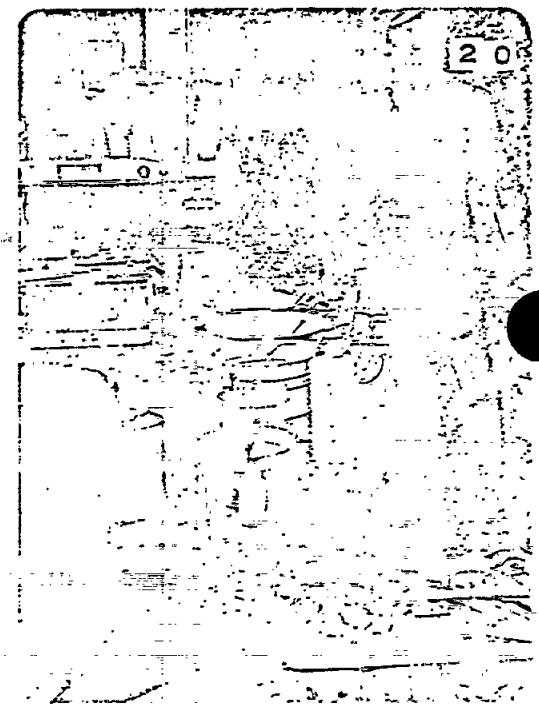
DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
7/9/82/0945
BY C. K. LEE

RINSED WITH DRINKING QUALITY WATER BEFORE LEAVING THE SITE

C. K. Lee

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log

Photograph 19 - A rotary drilling rig is installed at site B-5.



Photograph 20 - The decon line was set for taking soil samples.

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log

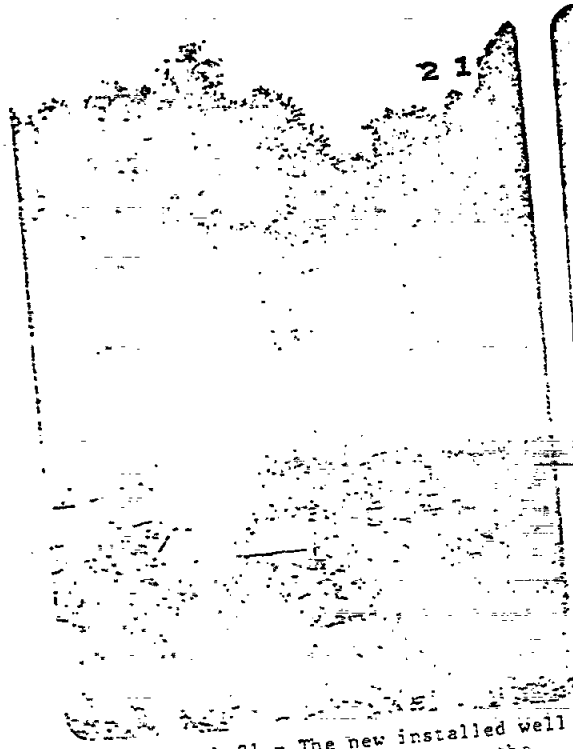
Photo # 19 DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
6/23/82/1000
BY C K LEE

A ROTARY RIG IS INSTALLED AT SITE B-5
C.K. LEE

Photo # 20 DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
6/23/82/1000
BY C.K LEE

THE DRIVE LINE WAS USED FOR DRIVING SOIL SAMPLES
C.K. LEE

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log



Photograph 21 - The new installed well B-5 is located adjacent to the abandoned well OW-5.

Photograph 22 - Water sampling at well B-5.

6-2-21

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log

PHOTO #21 DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
7/1/82/1000
BY C.K. LEE

PHOTO #22
DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
7/14/82/0951
BY C.K. LEE

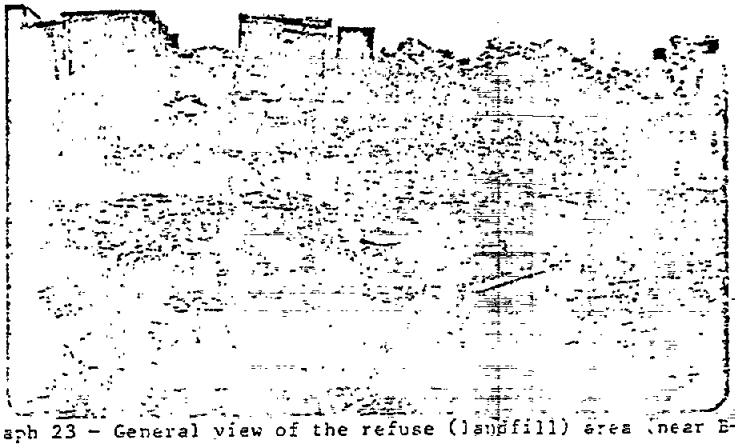
THE LOCATION OF WELL B-5
IS LOCATED ADJACENT TO THE
ABANDONED WELL OW-5
C.K. Lee

WELL DRILLING AT WELL
B-5
C.K. Lee

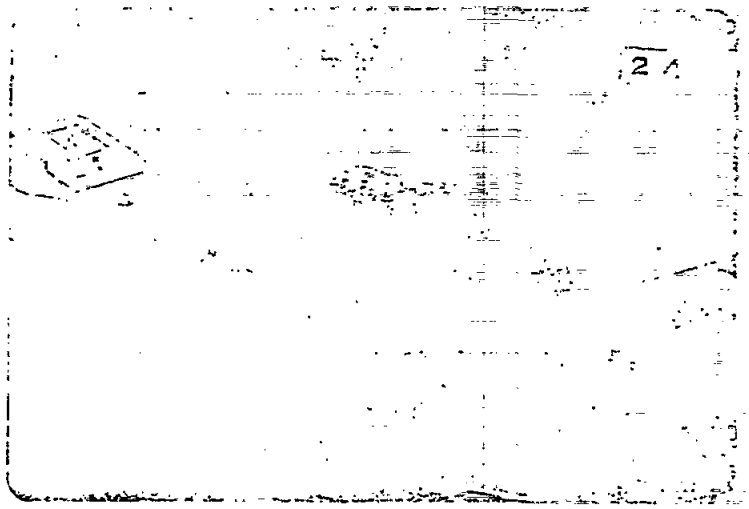
6-2-22

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log

23



Photograph 23 - General view of the refuse (landfill) area (near B-3 site).



Photograph 24 - Detecting with hnu while soil sampling at the stained are near landfill entrance.

6-2-23

Well Drilling at:
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log

PHOTO #23 DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
7/7/82/1300
BY LAREN LASKY

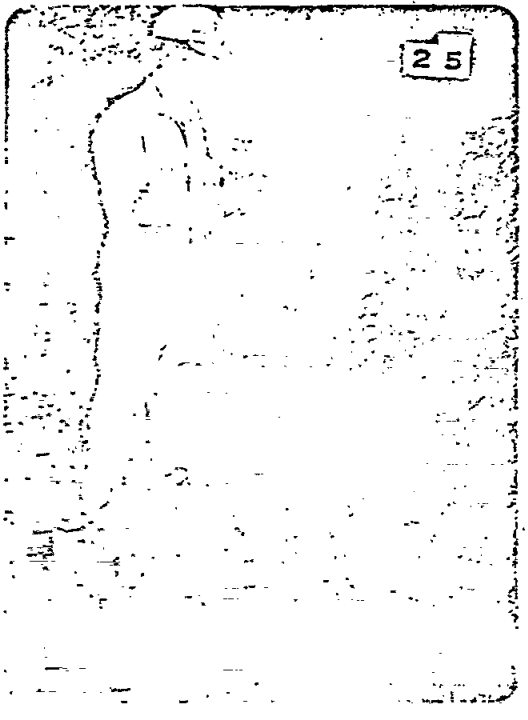
GENERAL VIEW OF REFUSE (LANDFILL) AREA (NEAR D-2 SITE)

PHOTO #24 DELAWARE SAND & GRAVEL
F3-8202-04C
DE-17
7/14/82/1030
BY C.K. LEE

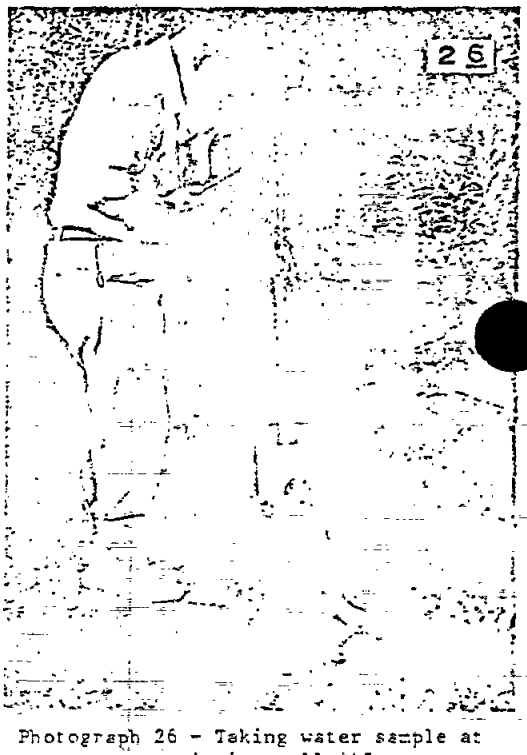
DRILLING WITH HSA WHILE SOIL SAMPLING AT THE SOUTH END NEAR LANDFILL ENTRANCE

C.K. Lee

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log



Photograph 25 - Water sampling at existing well #39.



Photograph 26 - Taking water sample at existing well #45.

Well Drilling at
Delaware Sand and Gravel Landfill
New Castle, Delaware
TDD No. F3-8202-04C
EPA No. DE-17
Photographic Log

6-2-26

ATTACHMENT 3

DOCUMENT # 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA

RECEIVED
JUN 24 1982
ecology and environment, inc.
Philadelphia

JUN 16 1982

To: Bob Touhey
From: Chris Haddaway
597-2193

Mr. Bob Touhey, Manager
Water Resources Division
Dept. of Natural Resources &
Environmental Control
Dover, Delaware 19901

Dear Bob:

Attached are copies of the coorespondence between EPA and the Delaware State Board of Registration of Geologists. The letter of June 8 confirms the procedures that EPA will formally institute regarding the preparation or reports which contain hydrogeological evaluations of sites in Delaware.

As you know, Ecology and Environment has subcontracted A.C. Schultes, to drill additional monitoring wells at the Delaware Sand & Gravel Landfill, New Castle County. This work is tentatively scheduled to commence on June 23, 1982; however, before this work can begin, the E & E office requested a similar letter of confirmation from the DNREC.

This letter should be addressed to Walter Lee, and include the following items:

a) agreement with the general EPA review process over contractor geologists
b) specific agreement regarding the location points for the monitoring wells at the Delaware Sand & Gravel Landfill.

On April 12, 1982 a meeting was held in Dover, among Lisa Hamilton, Mike Apgar, C.K. Lee (E&E), and myself, in order to discuss the hydrogeological stucy at the Army Creek/Delaware Sand & Gravel Landfills, and specified drilling locations. Initially, Mike requested that six pairs of wells be drilled as opposed to the suggested 5 wells. It was then explained that money for the drilling was limited, and that this task may be followed-up with additional drilling if deemed necessary. At the conclusion of the meeting it was agreed that this propcsal would suffice as an initial step.

1 of 5

Please discuss this matter with your staff and forward the necessary letter, as soon as possible to avoid any furtner delays for the drilling.

Thank you,

Christine Hladchuk

Christine Hladchuk
Project Officer
Superfund/RCRA Compliance Section

2 of 5

DOCUMENT #2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

Mr. Emil Onuschak, Chairman
State Board of Registration of
Geologist
Delaware State Office Building
820 French Street, 3rd Level
Wilmington, DE 19801

Dear Mr. Onuschak:

Thank you for the time and effort you expended in order to clarify my questions on the registration of geologists in Delaware.

From our previous phone conversations, I understand that this state requirement does not extend to federally employed geologist. Also the geologists under contract to the federal goverment need not register in Delaware, if their work is reviewed and concurred upon by a federal geologist.

Please be assured that at all times EPA will contract only licensed drillers, and a state geologist will be involved to review any reports and work scopes prior to the issuance of all necessary permits, or the release of the information.

In order to document our conversations would you please respond in writing to clarify these agreements. Again, I thank you for all your consideration and efforts.

Sincerely,

Chris Hladchuk

Christine Hladchuk, Project Officer
Superfund/RCRA Compliance Section

cc: T. Voltaggio
R. Bianco
R. Touhey, DNREC
J. McGovern, Ecology & Environment

3 of 5

8202-04A Document #
EPA # - De 17

STATE OF DELAWARE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF BUSINESS AND OCCUPATIONAL REGULATION
STATE BOARD OF REGISTRATION OF GEOLOGISTS
DELAWARE STATE OFFICE BUILDING
820 FRENCH STREET - 3RD LEVEL
WILMINGTON, DELAWARE 19801
PHONE: (302) 571 - 3286

June 8, 1982

Ms. Christine Hladchuk
Project Officer
Superfund/RCRA Compliance Section
U. S. Environmental Protection Agency
6th and Walnut Streets
Philadelphia, PA 19106

Dear Ms. Hladchuk:

The Delaware State Board of Registration of Geologists received your letter of May 7th, 1982 and considered it at the Board's May 27th meeting.

As was discussed with you by telephone, and with the advice of its counsel, the Delaware State Board of Registration of Geologists states as its policy that:

(1) Any geologist who is an employee of the Federal government may practice geology in pursuance of his employment in Delaware without registering with this Board.

(2) Independent geologists with whom a Federal agency contracts to do geological work in Delaware either have to be registered in the State, or work under the supervision of a geologist who is so registered or who is an employee of the Federal government pursuing his employment.

(3) In all cases, the name of the geologist who is to be considered responsible for the geologic contents of all written reports, permit applications, etc. must be clearly stated.

In regard to your letter of May 7th, be advised that the Delaware Geologists Registration Act does not apply to well drillers (24 Del. C. 3601).

In the same letter, you use the phrase "... a State Geologist will be involved to review any reports or work scopes prior to the issuance of all

necessary permits, or the release of the information." The Board is unclear as to the meaning of this phrase and requests clarification in this regard.

Very truly yours,

DELAWARE STATE BOARD OF
REGISTRATION OF GEOLOGISTS

By: _____
Emil Onuschak, Jr.
Chairman

EOJr/vfm

[illegible]
WATER RESOURCES SECTION
[illegible]

Document #4

June 22, 1982

Mr. Walter Lee
U.S. EPA, Region III
6th & Walnut Streets
Philadelphia, PA 19106

Dear Mr. Lee:

The Department of Natural Resources and Environmental Control has the following comments on Christine Wladchuk's letter of June 16, 1982 concerning the EPA review process over contractor geologists and the drilling at the Delaware Sand and Gravel Landfill:

1. The Department has no objection to the review process outlined in Christine Wladchuk's letter of June [illegible] to [illegible], [illegible] State Board of Registration of Geologists. It is [illegible] understanding that the review by a state geologist [illegible] the review of reports by a Department of Natural Resources and Environmental Control geologist [illegible] will be incorporated into or attached to the final report.

2. The locations of the five proposed monitoring wells are [illegible] acceptable to the Department for the purpose [illegible] at the [illegible] for the Delaware Sand and Gravel Landfill site. However, more [illegible] wells will be needed at the site to better define the [illegible].

If [illegible] any further questions, please call [illegible] at (302) 736-5739.

Very truly yours,

[illegible]

DOCUMENT #5

ecology and environment, inc.
8021 ROUTE 130, PENNSAUKEN, NEW JERSEY 08110, TEL. 609-665-1515
International Specialists in the Environmental Sciences

June 23, 1982

Ms. Lisa Hamilton
Department of Natural Resources and
Environmental Control
P. O. Box 1401
Edward Tatnall Building
Dover, DE 19901

Re: TDD No. F3-8202-04

Dear Lisa:

This is to confirm our phone conversation on June 22, 1982 about the well drilling for Delaware Sand and Gravel. Providing you get the information you need from the driller, A. C. Schultes & Sons, Inc., by Friday, June 25, and that it satisfies the permit requirements, a phone call from Schultes to obtain the permit numbers will allow mobilization on Monday, June 28. The E&E site representative will be Loren Lasky.

If there are any questions concerning this matter, please contact Loren.

Sincerely yours,

Beth Gross

mjo

CC: Linda Young Boornazian, Acting DPO
EPA III

DOCUMENT # 6

ecology and environment, inc.

8021 ROUTE 130, PENNSAUKEN, NEW JERSEY 08110, TEL. 609-665-1515

International Specialists in the Environmental Sciences

March 31, 1982

Mr. Timothy Rafferty, Esq.
Custom House Plaza
Suite 514
Wilmington, Delaware 19801

Subject: Drilling, Sampling and Installation of Monitoring Wells at Delaware Sand and Gravel Landfill, New Castle County, Delaware

Dear Mr. Rafferty:

Ecology and Environment, Inc. (E&E), a New York Corporation with Headquarters at 195 Sugg Road, Buffalo, NY 14225, and with a business office at 8021 Route 130, Pennsauken, NJ 08110, has entered into a contract (Contract #68-01-6056) with the United States Environmental Protection Agency (EPA), dated March 20, 1980, to furnish technical, engineering and managerial services in support of the EPA Field Investigation of Potentially Hazardous Waste Sites.

As discussed with you during our telephone conversations of March 17, 24, 25 and 29, the U. S. EPA Region III has requested that we perform a groundwater monitoring and subsurface geologic study at your client's site, Delaware Sand and Gravel, located in New Castle County, Delaware. I have enclosed a copy of a sketch showing the approximate locations of the proposed drilling (identified as Figure 2). The proposed drilling activities at the site will be of a varied nature and will include the following: B-1) 50 +/- foot deep, 4-inch diameter monitoring well just outside the waste disposal pit, B-2) 20 +/- foot deep test boring adjacent to B-1 but within the waste disposal pit area, B-3) 50 +/- foot deep test boring within the landfilled refuse area, B-4) 150 +/- foot deep, 4-inch diameter monitoring well adjacent to existing well #53, and B-5) 150 +/- foot deep, 4-inch diameter monitoring well adjacent to existing well #OW-5. The final depths and locations will be adjusted in the field by E&E personnel. The wells will be permanent installations to monitor groundwater and the test borings will sample subsurface soils. The latter will be backfilled at completion as specified by E&E.

In order that the bidders will be able to estimate the cost to mobilize and demobilize their equipment, it is essential that they be able to make an on-site reconnaissance of the proposed drilling locations. Your client has agreed to permit the bidders access to the site as long as he is informed of their visit ahead of time. The bidders have been directed, therefore, within the drilling specifications to schedule this on-site reconnaissance through you, as agreed.

Furthermore, your client has granted E&E and its drilling subcontractors permission to 1) come on site to do the above mentioned drilling work, and 2) disperse all the drilling spoils/cuttings, water, and other materials generated in connection with the above mentioned work on the ground.

We are now progressing on the basis of understanding of the above discussions. Should there be any corrections, please contact me at my office.

Very Truly yours,

Frank J. Quirus, AFITL III

Enclosure

CC: Linda Young Boornazian, DPO, EPA III
Lisa Seglin, EPA III
Chris Hladchuck, EPA III

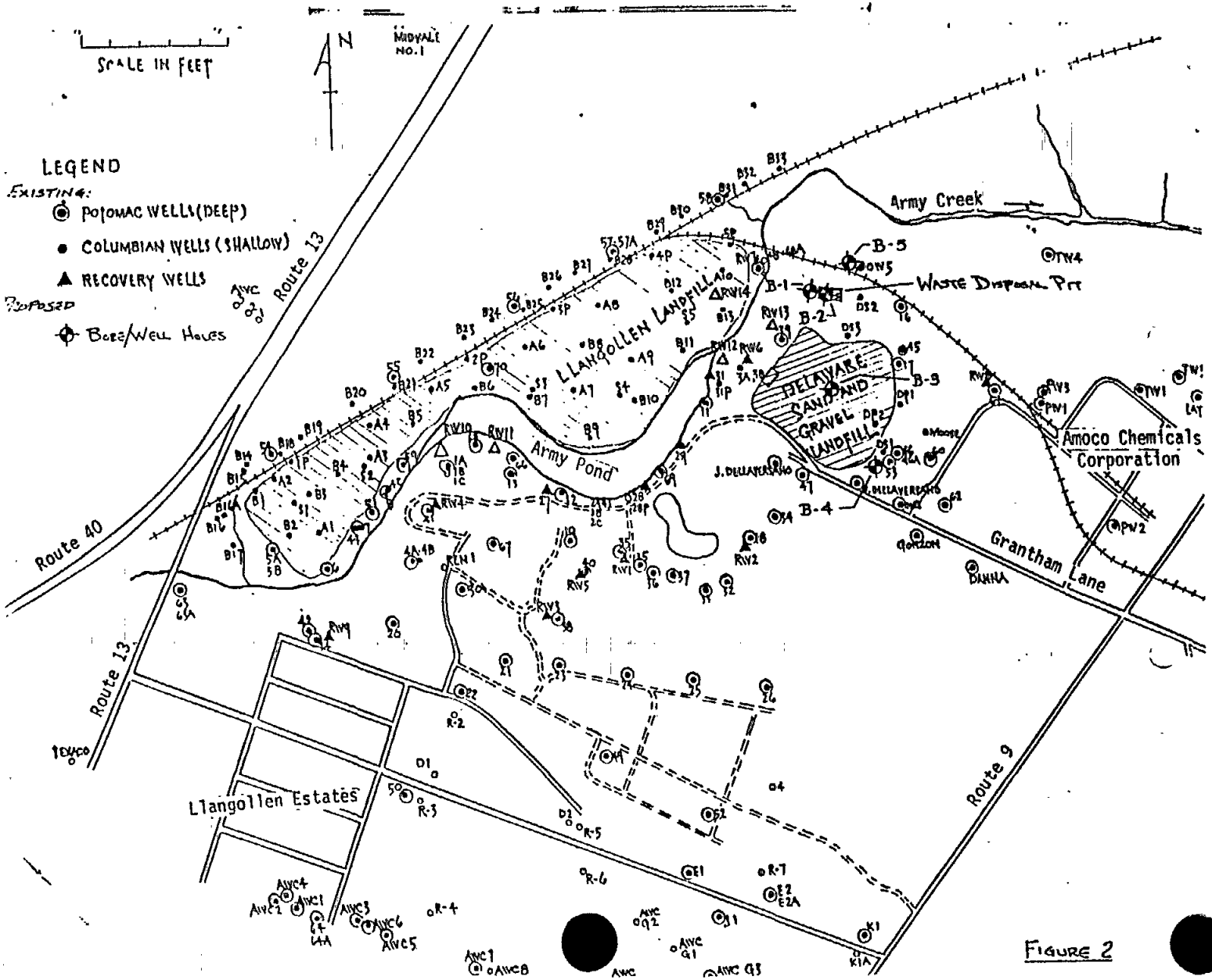


FIGURE 2

DOCUMENT #7

ecology and environment, inc.

8021 ROUTE 130, PENNSAUKEN, NEW JERSEY 08110, TEL. 609-665-1515

International Specialists in the Environmental Sciences

June 25, 1982

Mr. Timothy Rafferty, Esq.
Custom House Plaza
Suite 514
Wilmington, DE 19801

Subject: Commencement of Drilling for the Installation
Of Monitoring Wells at Delaware Sand and
Gravel Landfill, New Castle County, DE
TDD No. F3-8202-04B EPA No. DE-17

Dear Mr. Rafferty:

This letter will confirm our phone conversation today concerning our intention to start work at your client's site, Delaware Sand and Gravel Landfill, on Monday, June 28. Four members of Ecology and Environment's technical staff, plus two drillers, are scheduled to be working on site. As agreed, you will notify the site owner, Mr. Vincent Dellaversano, to expect us.

Work will commence at hole number B-4, described and identified on the map in our letter of March 31, 1982. We will gain access for this particular area via Amoco's property, by prior arrangement with Mr. Charles Hurd at the Amoco Chemical Truck Terminal. All the other holes will be accessed directly through the Delaware Sand and Gravel Landfill's property.

We anticipate that the drilling and sampling will take between 10-15 work days, and we will notify you when the project is completed. In the meantime, please contact Mr. Frank Quirus of our office if you have any questions or comments concerning the above work.

Very truly yours,

Loren R. Lasky/mjo

Loren R. Lasky
Geologist, FIT III

mjo

CC: Linda Young Boornazian, Acting DPO, Region III
Lisa Seglin, EPA III
Chris Hladchuk, EPA III

Document # 8

ecology and environment, inc.
8021 ROUTE 130, PENNSAUKEN, NEW JERSEY 08110, TEL. 609-665-1515
International Specialists in the Environmental Sciences

July 21, 1982

Mr. Timothy Rafferty, Esq.
Custom House Plaza
Suite 514
Wilmington, DE 19801

Subject: Termination of Well Drilling Work
Delaware Sand and Gravel Landfill
New Castle County, Delaware
TDD No. F3-[redacted] EPA No. DE-17

Dear Mr. Rafferty:

As we discussed in our phone conversations of 14 July and 21 July, Ecology and Environment, Inc. has completed the scheduled well drilling work at the Delaware Sand and Gravel Landfill.

In accordance with EPA procedures, I am enclosing a sample receipt listing the number of samples we collected on Delaware Sand and Gravel Landfill property. Kindly have Mr. DellAversano sign it and then return it to our office.

As per your instructions, your client, Mr. DellAversano, did not want to have a set of split samples. However, we did leave a representative set of soil samples at the DellAversano household on 14 July, as per your request.

Again, please accept our thanks for your assistance and cooperation during this work.

Sincerely,

Loren R. Lasky

Loren R. Lasky
Geologist/FIT III

mjo

Enclosure

recycled paper

DOCUMENT # 9

ecology and environment, inc.
8021 ROUTE 130, PENNSAUKEN, NEW JERSEY 08110, TEL. 609-665-1515
International Specialists in the Environmental Sciences

June 24, 1982

Mr. Charles Hurd
Amoco Chemicals Truck Terminal
Route 9 and River Road
New Castle, DE 19720

Re: Access to Amoco's Property for the Drilling of a Groundwater Monitoring Well, Adjacent to Amoco Chemical's Well #OW-5

TDD No. F3-8202-04R
EPA No. DE-17

Dear Mr. Hurd:

This letter will confirm our phone conversation today concerning access to Amoco's property for the purpose of drilling a monitoring well.

As agreed, both Ecology and Environment personnel and the drilling crew will check in with you at the Amoco Chemical Truck Terminal on the first day of work. We will sign Amoco release forms and you will unlock the gate allowing us to cross onto Amoco's property.

We anticipate starting work on Monday, June 28, or some time during that week, depending on when the driller receives the required permits.

Attached, please find a copy of an earlier correspondence with Mr. Ray Watrous of Amoco (now retired) for your information.

Please contact me if you have any questions or comments concerning the above project.

Very truly yours,

Loren R. Lasky

Loren R. Lasky
Geologist, FIT III

mjo
Attachment

CC: Linda Young Boornazian, Acting DPO, EPA III
Lisa Seglin, EPA III
Chris Hladchuk, EPA III

DOCUMENT #10

ecology and environment, inc.
8021 ROUTE 130, PENNSAUKEN, NEW JERSEY 08110, TEL. 609-665-1515
International Specialists in the Environmental Sciences

April 28, 1982

Amoco Chemicals Corporation
P. O. Box 312
New Castle, DE 19720

Attention: Mr. Ray Watrous

Subject: Drilling, Sampling and Installation Monitoring Well Adjacent to Amoco Chemicals' Well #OW-5

Dear Mr. Watrous:

As discussed with you over the telephone on March 31, 1982, Ecology and Environment, Inc. (E&E) under a contract (Contract #68-01-6056) with the U. S. EPA is soliciting bids installing monitoring wells on and adjacent to Delaware Sand and Gravel in New Castle County. In addition to wells on the property of Delaware Sand and Gravel, it is proposed to install one well adjacent to #OW-5. Per our discussion, this well is on the Amoco Chemicals Corporation property.

This letter will confirm that Amoco Chemicals Corporation has granted E&E permission to access this well location and drill the proposed monitoring well. Furthermore, excess drilling spoils and water that cannot be discharged back into the well may be dispersed in an orderly manner in the area of the well.

It is our understanding that Amoco Chemicals is presently demolishing their plant. As such, coordination of E&E's access to Amoco's property should be arranged via telephone with Mr. Charles Hurd @ (302) 322-1878.

We are progressing on the basis of understanding of the above discussion. Should there be any corrections, please contact me at my office.

Very truly yours,

Frank J. Quirus, P.E.
AFITL III

mjo

CC: Linda Young Boornazian, EPA III
Lisa Seglin, EPA III
Chris Hladchuck, EPA III

recycled paper

AR100223

Document #11

ecology and environment, inc.
8021 ROUTE 130, PENNSAUKEN, NEW JERSEY 08110, TEL. 609-665-1515
International Specialists in the Environmental Sciences

July 21, 1982

Mr. Charles Hurd
Amoco Chemicals Truck Terminal
Route 9 and River Road
New Castle, DE 19720

Subject: Completion of Well Drilling at
Delaware Sand and Gravel Landfill and
adjacent Amoco Chemicals Corporation property
New Castle, Delaware
TDD No. F3-8202-048 EPA No. DE-17

Dear Mr. Hurd:

I am writing to advise you that Ecology and Environment, Inc. has completed our scheduled well drilling work at the Delaware Sand and Gravel Landfill and on Amoco's property adjacent to the landfill.

In accordance with EPA procedures, I am enclosing a sample receipt which lists the number and type of samples we collected while working on Amoco's property. Would you kindly sign the receipt and return it to our office.

Please accept my thanks for your cooperation and assistance during this work.

Sincerely,

Loren R. Lasky

Loren Lasky
Geologist/FIT III

mjo

Enclosure

DOCUMENT # 12

SAMPLE RECEIPT

On June 30, 1982, Ecology and Environment, Inc., representative Loren R. Lasky received permission from C. Hurd to remove material from Amoco property, contained in 1 1/2 gallon glass organic sample bottle(s), 2 40 ml glass volatile organic sample bottle(s), 2 8 oz. glass soil sample jar(s) and 2 inorganic 1 quart polyethylene sample bottle(s).

Property Owner, Signature and Date

Loren R. Lasky 7/21/82

Ecology and Environment, Inc.
Representative Signature and Date