39887

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Trenton, New Jersey

Preliminary Report:

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
COMBE FILL SOUTH LANDFILL
Volume II
Appendices

February 1986

LAWLER, MATUSKY & SKELLY ENGINEERS

as Prime Contractor

in Association with

R.E. WRIGHT ASSOCIATES, INC.

#455-102

302257

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON, NEW JERSEY

PRELIMINARY REPORT

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

COMBE FILL SOUTH LANDFILL

VOLUME II APPENDICES

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302258

Project No. 455-102

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APPENDIX A

AIR QUALITY MODELING FOR
COMBE FILL SOUTH LANDFILL RI/FS

Introduction

The Industrial Source Complex Long-term (ISCLT) model developed by Bowers, Bjorklund and Cheney of H.E. Cramer Company, Inc. was used to calculate off-site concentrations of total volatile organics emanating from Combe Fill South landfill. The ISCLT model calculates ground level, average concentrations of consitituents at specified distances or locations from an air emission source.

Program Options

Annual average, ground-level concentrations are calculated for a polar coordinate grid at radii of 0.5, 1.0, and 5.0 miles, where the center of the polar coordinate grid is positioned at the southwest corner of the Combe Fill South landfill (Figure A-1). The Combe Fill South landfill is estimated to be a square landfill with no terrain elevations. The total volatile organics emitted are calculated on the basis of a constant emission rate and no decay mechanisms.

Data Input

The meteorological data used by the ISCLT model include:

- STAR summaries, tabulations of the joint frequency of occurrence of wind speed and wind-direction categories, classified according to the Pasquill stability categories

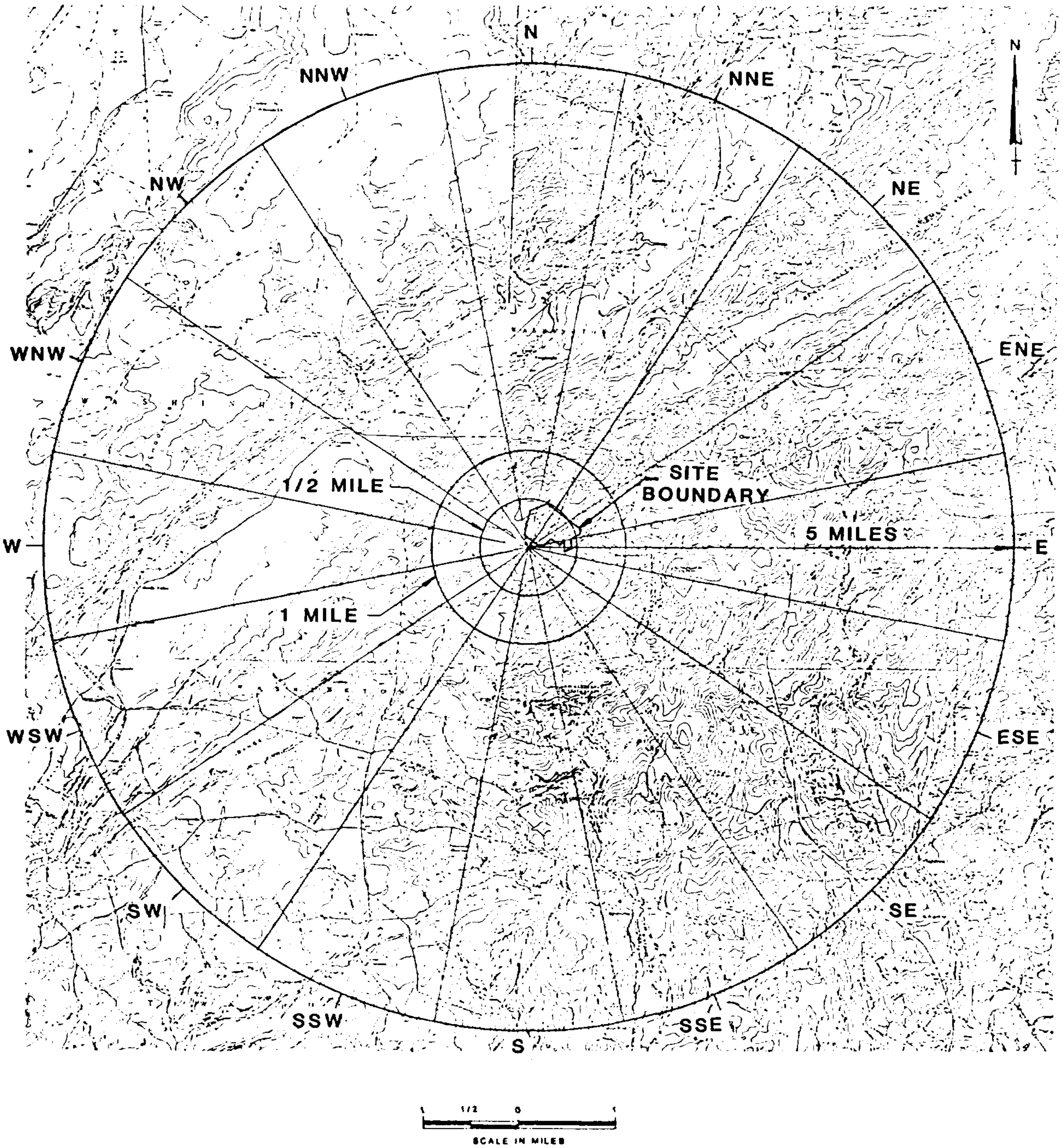
- Annual mean afternoon mixing heights classified according to the Pasquill stability categories. The mean afternoon mixing height is assigned to the B, C, and D stability categories; 1.5 times the mean afternoon mixing height is assigned to

302261

FIGURE A-1

COMBE FILL SOUTH LANDFILL RI/FS

AREA COVERED BY CIRCULAR DISTRIBUTION OF VOLATILE ORGANICS SHOWN IN FIGURE



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One Blue Hill Plaza

Pearl River, New York 10965

the A stability category, and an infinite mixing height is assigned to the E and F stability categories.

- Ambient annual air temperatures classified according to the Pasquill stability categories. The average annual maximum daily temperature is assigned to the A, B, and C stability categories, the average annual minimum daily temperature is assigned to the E and F stability categories, and the average annual daily temperature is assigned to the D stability category.

STAR summaries, mean afternoon mixing heights, and ambient annual air temperature from Wilkes Barre/Scranton, PA, were used because of the area's topography and meteorology are similar to those of the landfill area and also because it had the most complete set of data needed to run the model.

Other data inputs to the model include:

- Volatile emission rate is calculated assuming a completely mixed air volume, wind movement perpendicular to the landfill, concentration of contaminants in terms of mass/area/time, and no decay mechanisms. The upwind concentration is subtracted from the concentration at the landfill, both measured during the September 1985 sampling. A 1-m concentration height is assumed for just above ground surface sampling.

- Wind-profile exponents classified according to the Pasquill stability categories. Stability Categories E and F are assigned 0.30 and stability categories A, B, C, and D are assigned 0.10, 0.15, 0.20, and 0.25, respectively.

- Verticle potential temperature gradients classified according to the Pasquill stability categories. Stability categories A, B, C, and D are assigned 0.000°K/m, and stability categories E and F are assigned 0.02 and 0.035°K/m, respectively.

302263

Data Output

The model evaluates impacts from site alone and does not include background concentrations. The data output consists of:

1. Average concentrations of site-generated volatile organics at radii of 0.5, 1.0, and 5.0 miles for each of the 16 wind directions in $\mu g/m^3$ (Figure A-2 and page 7 of model output). The concentration of volatile organics increases from southwest to northeast of the landfill, from a minimum of 3.699 to a maximum of 3.809 $\mu g/m^3$ primarily following predominant wind directions.

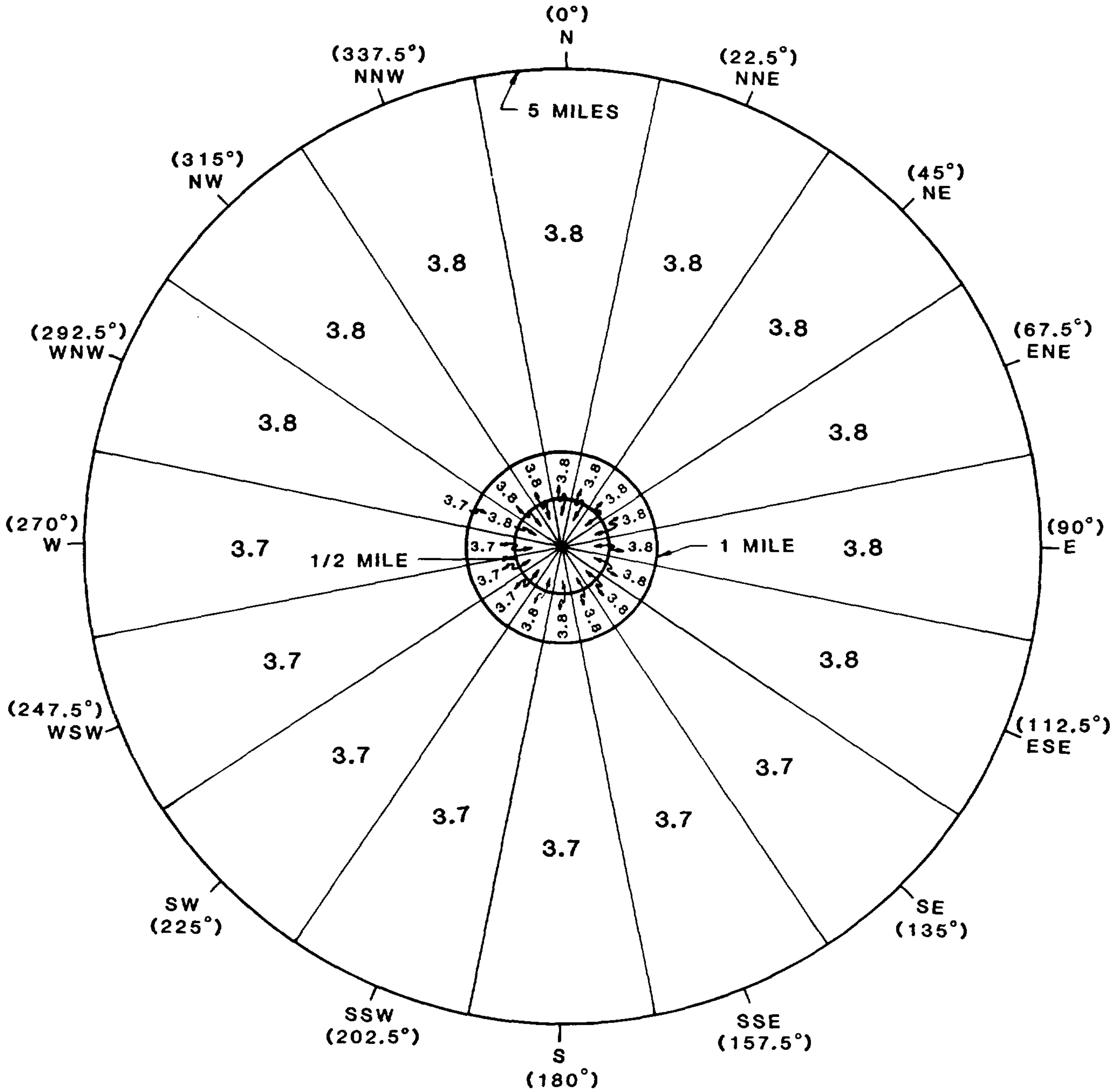
2. The sites of the 10 maximum concentrations. These sites occur mostly at the 5-mile radius and in the northeasterly direction (see page 7 of model output). Concentrations of volatile organics at these 10 sites range from 3.769 to 3.809 $\mu g/m^3$.

302264

FIGURE A-2

COMBE FILL SOUTH LANDFILL RI/FS

CIRCULAR DISTRIBUTION OF VOLATILE ORGANICS AS DETERMIND BY ISCLT MODELS



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302265

APPENDIX B

BOREHOLE GEOPHYSICAL INVESTIGATION

GEOPHYSICAL WELL LOGS

D-3, D-5, D-6, AND D-7

APRIL 1985

ELMER A. SIGOUIN COMPANY
COAL & WATER WELL EXPLORATION

HOLE Nº D-3
DATE 4/16/85
OPERATOR Mark J. Sigouin
TRUCK Nº 1
DRILLER

PROJECT AREA Combe Fill South
SEC. TWP. Chester RGE.
COUNTY Morris STATE New Jersey
GEOLOGIST Jeff Thompson
DRILL DEPTH 188 HOLE DIA. 6" CASING 6"

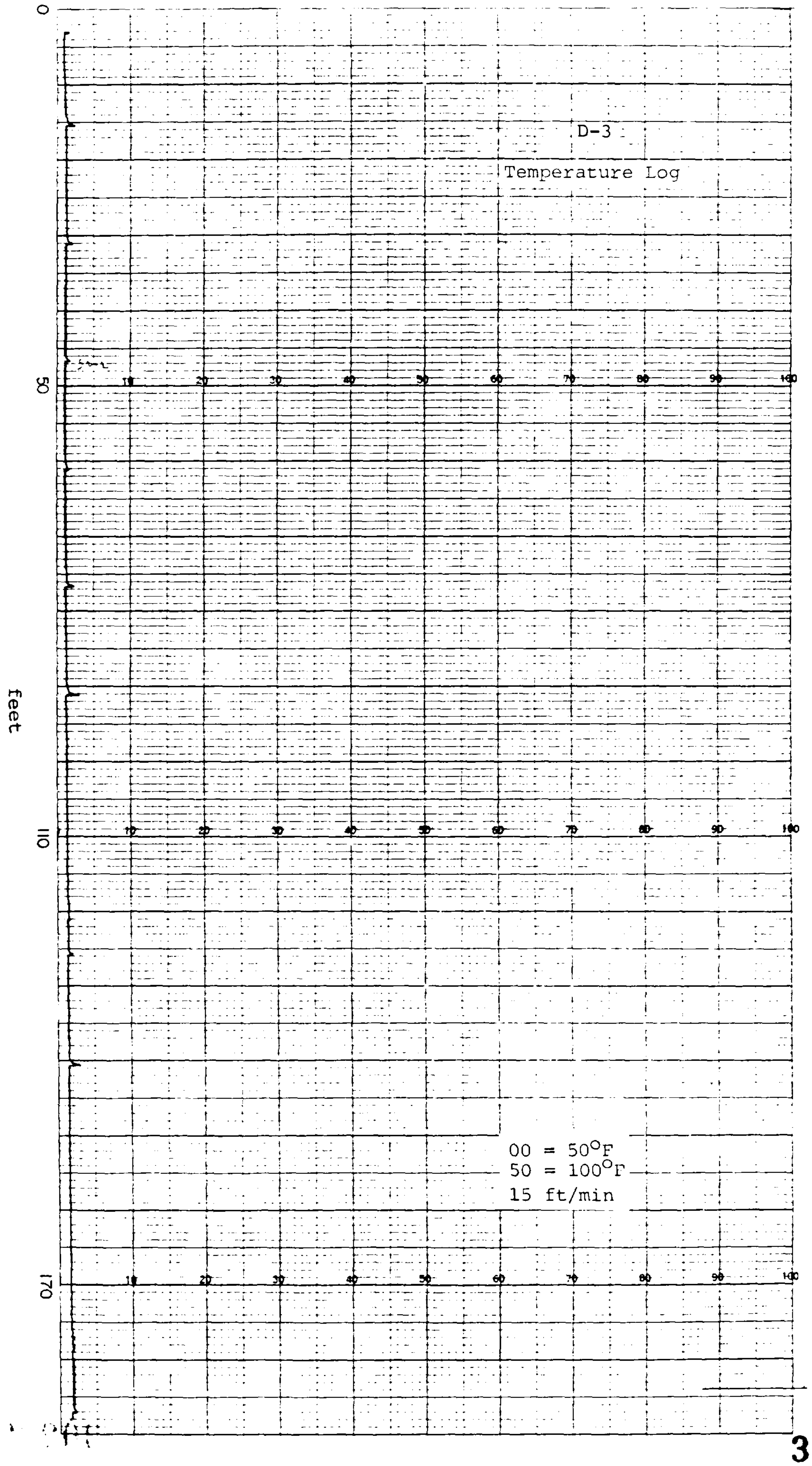
	GAMMA DATA RUN 1	GAMMA DATA RUN 2	DENSITY DATA RUN 1	DENSITY DATA RUN 2	HOURLY LOG
LOGGED INTERVAL	entire		entire		ARRIVAL TIME -
RANGE (5" full scale)	500 cps		2.5K cps above SWL	1K cps below SWL	STAND BY TIME -
TIME CONSTANT	2 sec.		1 sec.	1 sec.	DOWN HOLE TIME
LOGGING SPEED	15 ft/min.		15 ft/min.		START -
HOLE MEDIUM (Air)					FINISH -
(Water)					TOTAL TIME ON SITE -
K FACTOR					
CALIBRATED	00 = 0 cps		00 = 0 cps	10" spacer	
DRILLING AGENT					
FLUID DENSITY					

RESISTANCE OHMS PER FULL SCALE (5") 20 ohms
SELF POTENTIAL MILLIVOLTS PER FULL SCALE (5") 400 mV
RES. CONTACT OHMS PER FULL SCALE (5")
CALIPER 40 = 4" dia., 90 = 14" dia.
REMARKS: Temperature calibrations, 00 = 50°F, 50 = 100°F, 15 ft/min.

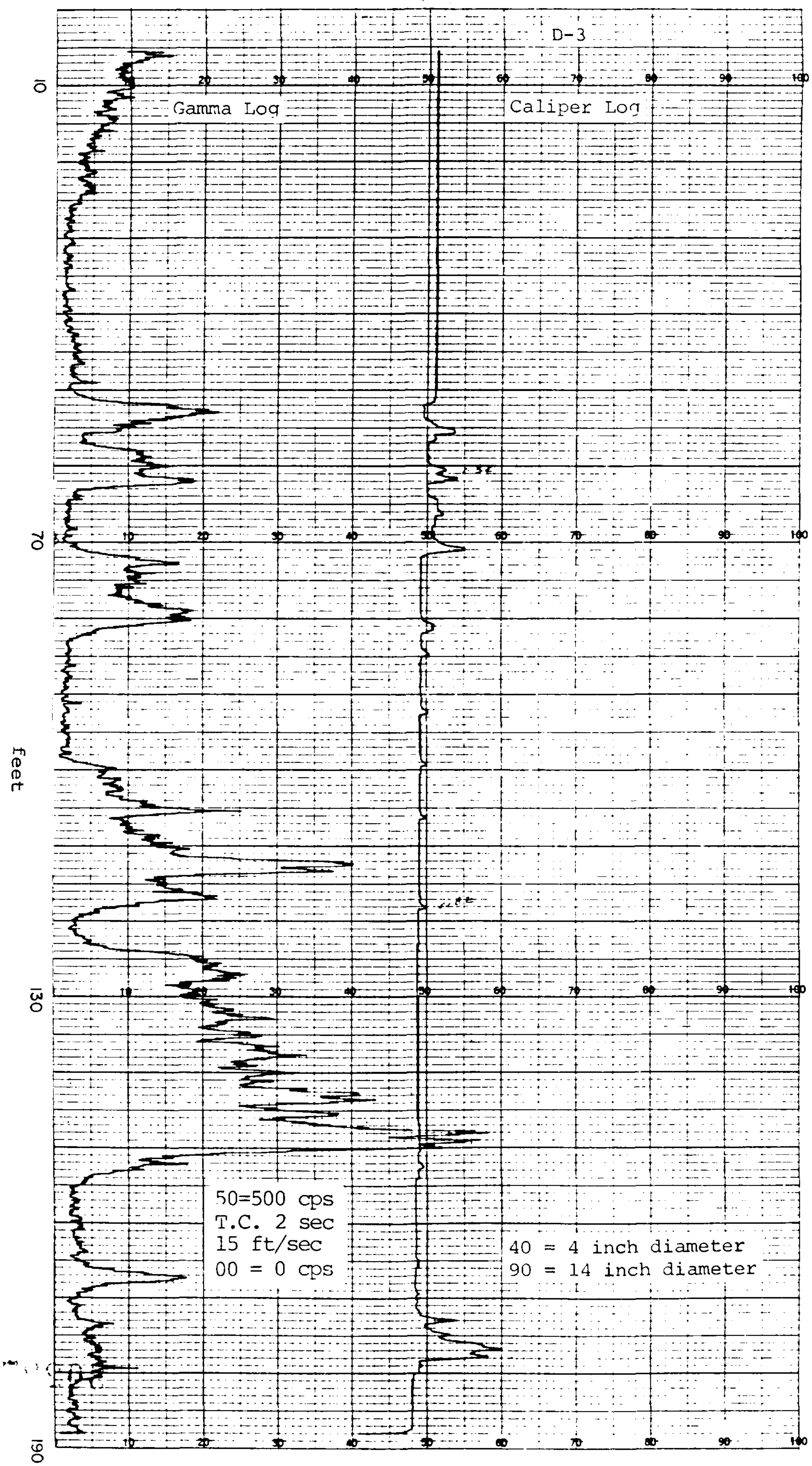
ESA CO.

B-1

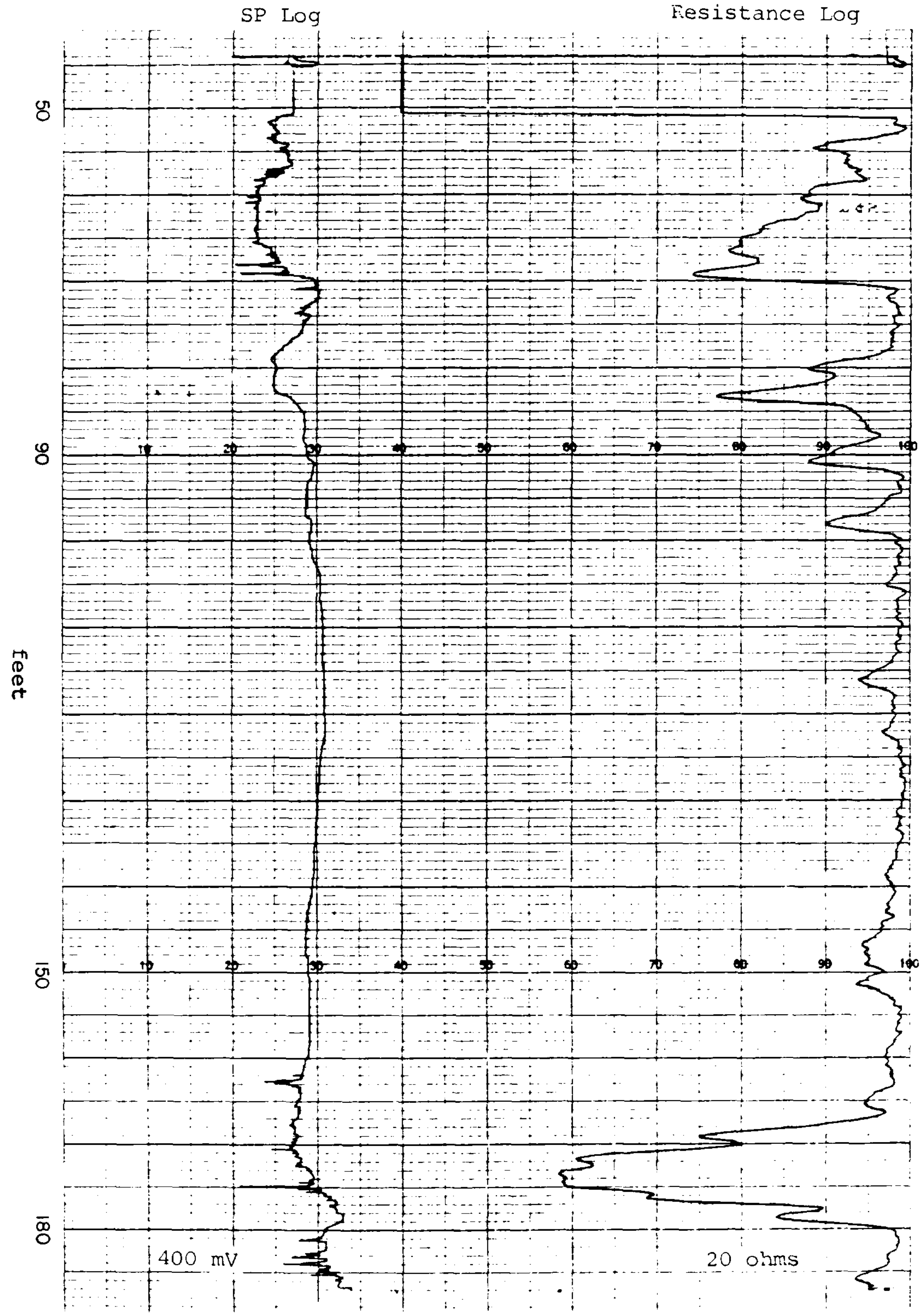
30226T


D-3
Temperature Log
00 = 50°F
50 = 100°F
15 ft/min
feet
0
50
110
170
10
20
30
40
50
60
70
80
90
100

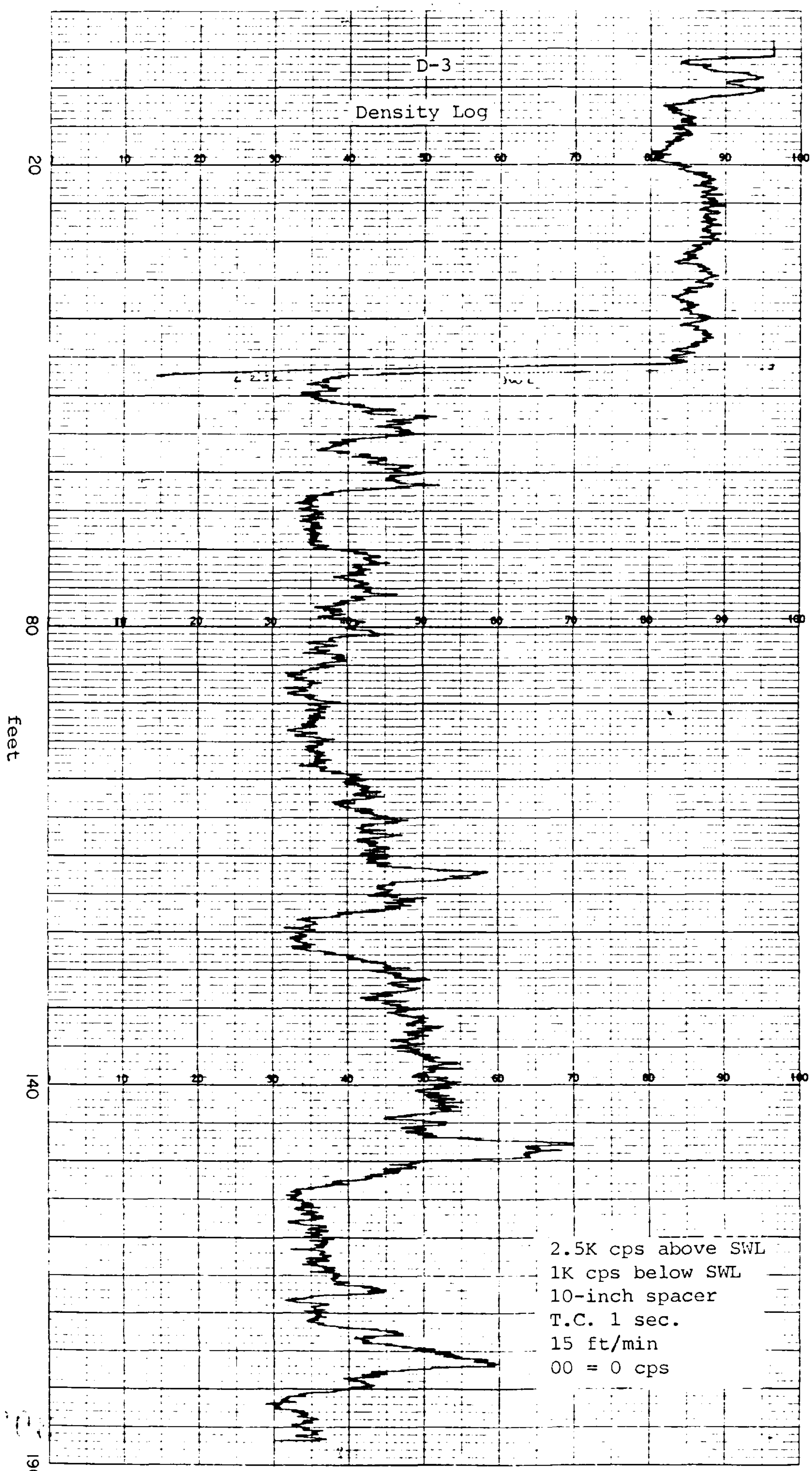
302268


D-3
Gamma Log
Caliper Log
feet
10
70
130
190
10 20 30 40 50 60 70 80 90 100
50=500 cps
T.C. 2 sec
15 ft/sec
00 = 0 cps
40 = 4 inch diameter
90 = 14 inch diameter

302269


SP Log
Resistance Log
50
90
150
180
feet
10
20
30
40
50
60
70
80
90
100
400 mV
20 ohms

302270


D-3
Density Log
10 20 30 40 50 60 70 80 90 100
20
80
140
190
feet
2.5K cps above SWL
1K cps below SWL
10-inch spacer
T.C. 1 sec.
15 ft/min
00 = 0 cps

302271

ELMER A. SIGOUIN COMPANY
COAL & WATER WELL EXPLORATION

HOLE Nº D-5
DATE 4/16/85
OPERATOR Mark J. Sigouin
TRUCK Nº 1
DRILLER

PROJECT AREA Combe Fill South
SEC. TWP. Chester RGE.
COUNTY Morris STATE New Jersey
GEOLOGIST Jeff Thompson
DRILL DEPTH 165.3' HOLE DIA. 6" CASING 6"

	GAMMA DATA RUN 1	GAMMA DATA RUN 2	DENSITY DATA RUN 1	DENSITY DATA RUN 2
LOGGED INTERVAL	entire		entire	
RANGE (5" full scale)	100 cps		2.5K below SWL	1K above SWL
TIME CONSTANT	2 sec.		1 sec.	
LOGGING SPEED	15 ft/min.		15 ft/min.	
HOLE MEDIUM (Air)				
(Water)				
K FACTOR				
CALIBRATED	00 = 0 cps		00 = 0 cps	10" spacer
DRILLING AGENT				
FLUID DENSITY				

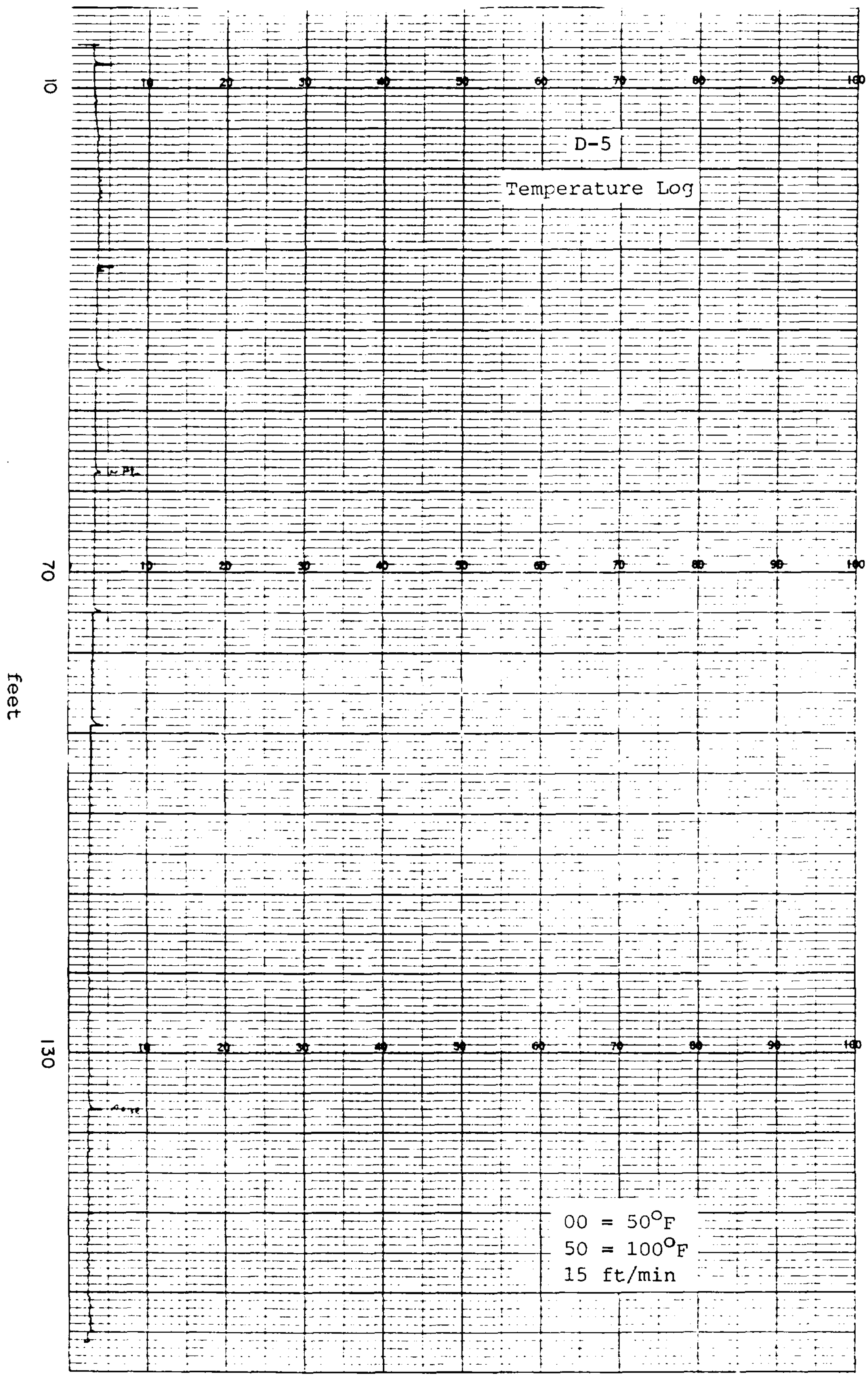
HOURLY LOG	
ARRIVAL TIME -	
STAND BY TIME -	
DOWN HOLE TIME	
START -	
FINISH -	
TOTAL TIME ON SITE -	

RESISTANCE OHMS PER FULL SCALE (5") 20 ohms
SELF POTENTIAL MILLIVOLTS PER FULL SCALE (5") 100mV
RES. CONTACT OHMS PER FULL SCALE (5")
CALIPER 40 = 4" dia., 90 = 14" dia.
REMARKS: Temperature calibrations, 00 = 50°F, 50 = 100°F, 15 ft/min.

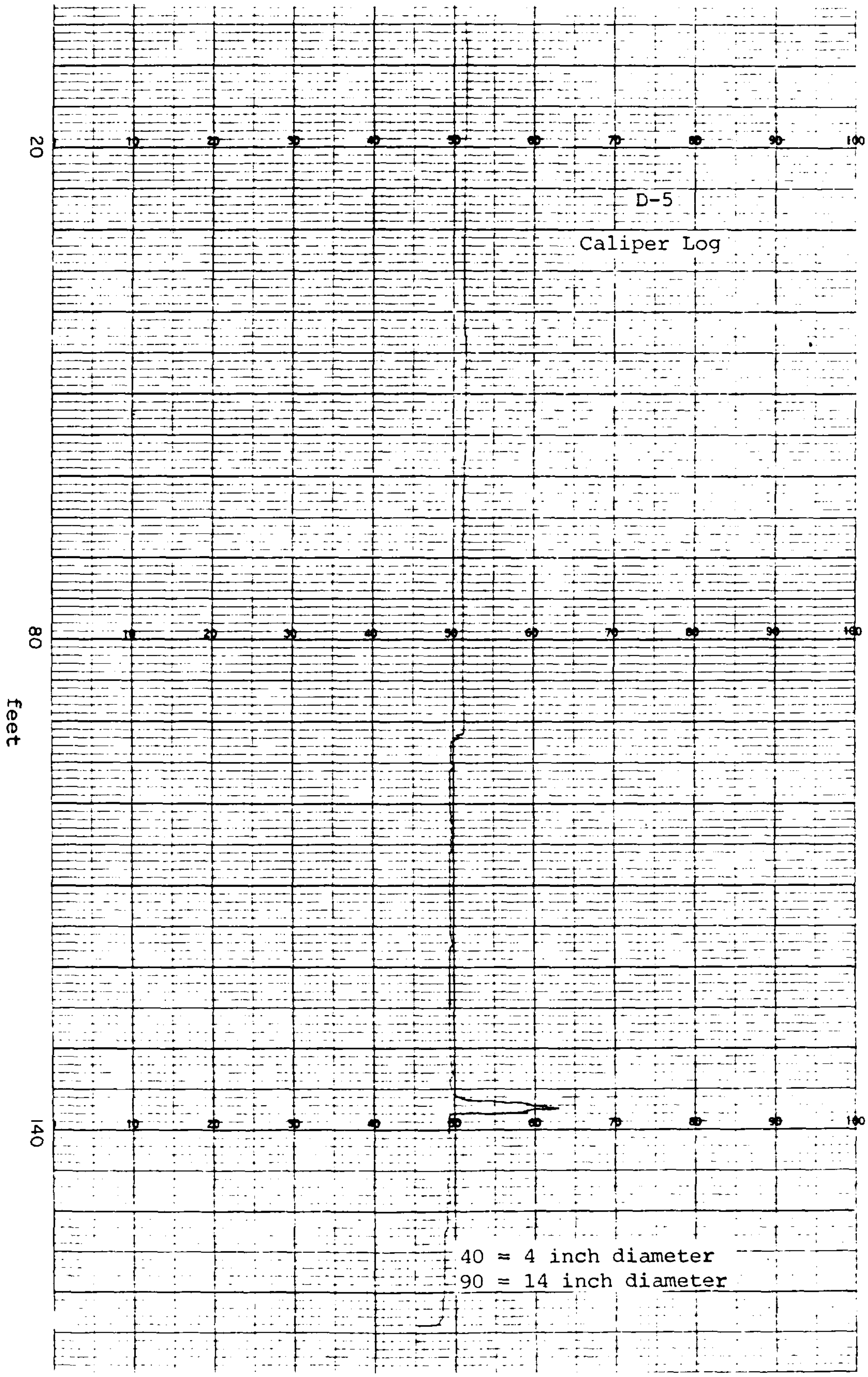
ESA CO.

B-6

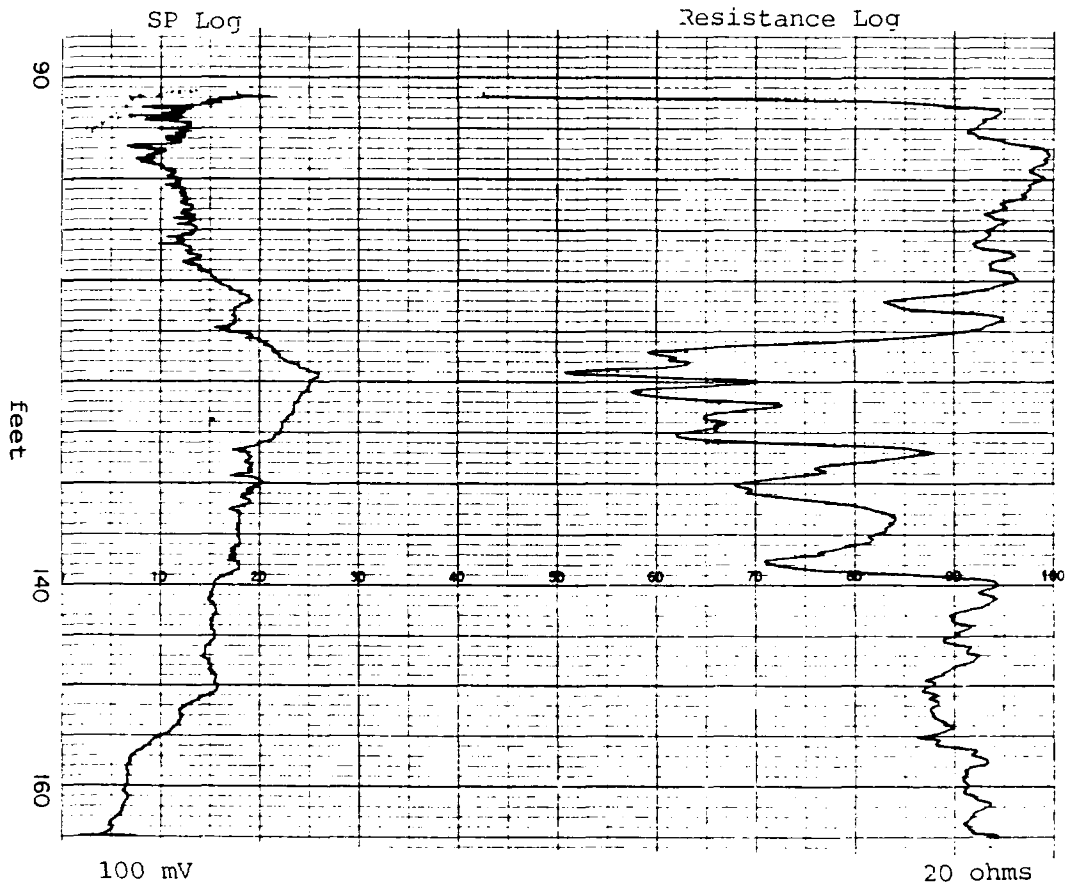
302272


D-5
Temperature Log
00 = 50°F
50 = 100°F
15 ft/min
feet
10
70
130
10 20 30 40 50 60 70 80 90 100

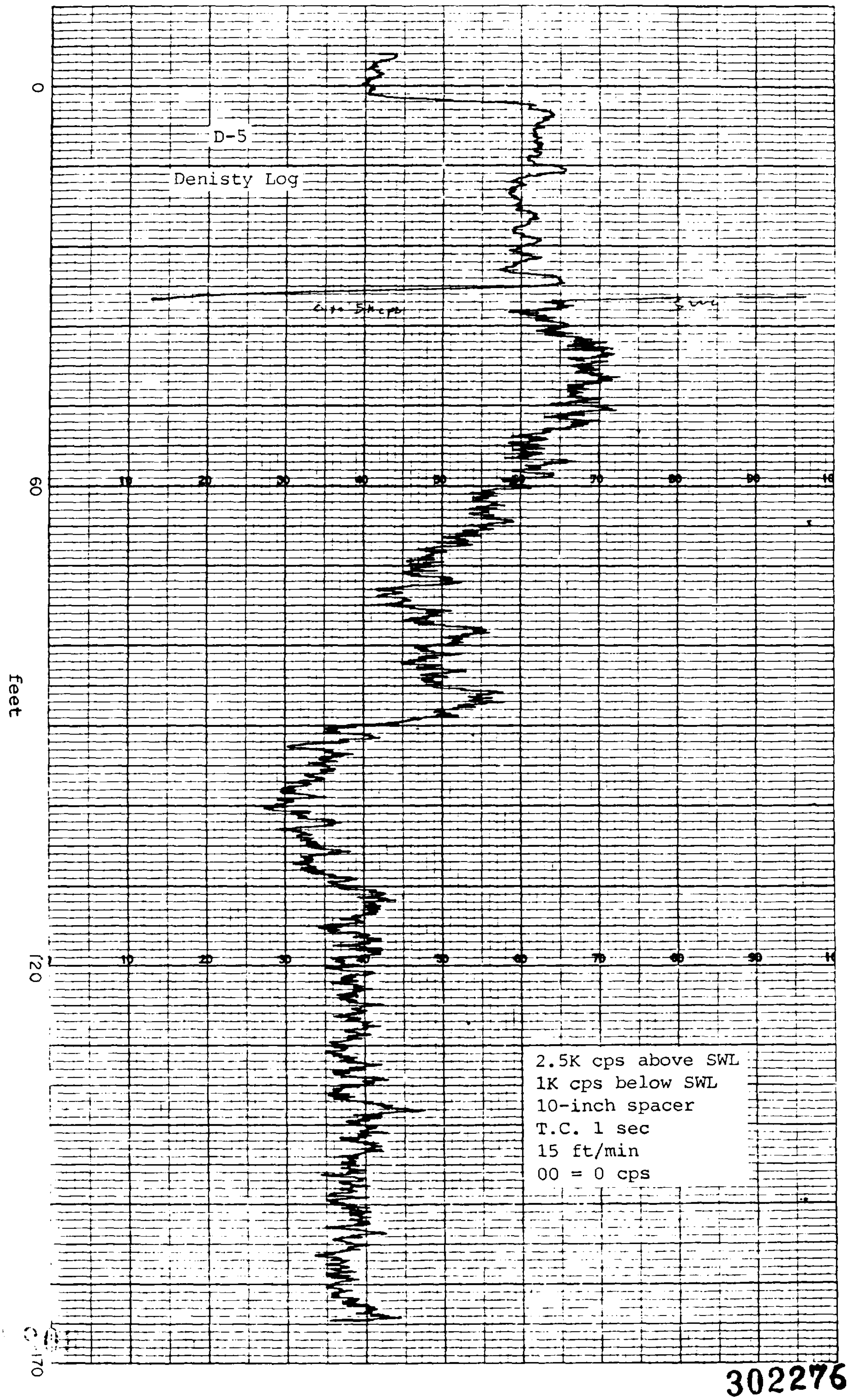
302273


D-5
Caliper Log
20
80
140
feet
10 20 30 40 50 60 70 80 90 100
40 = 4 inch diameter
90 = 14 inch diameter

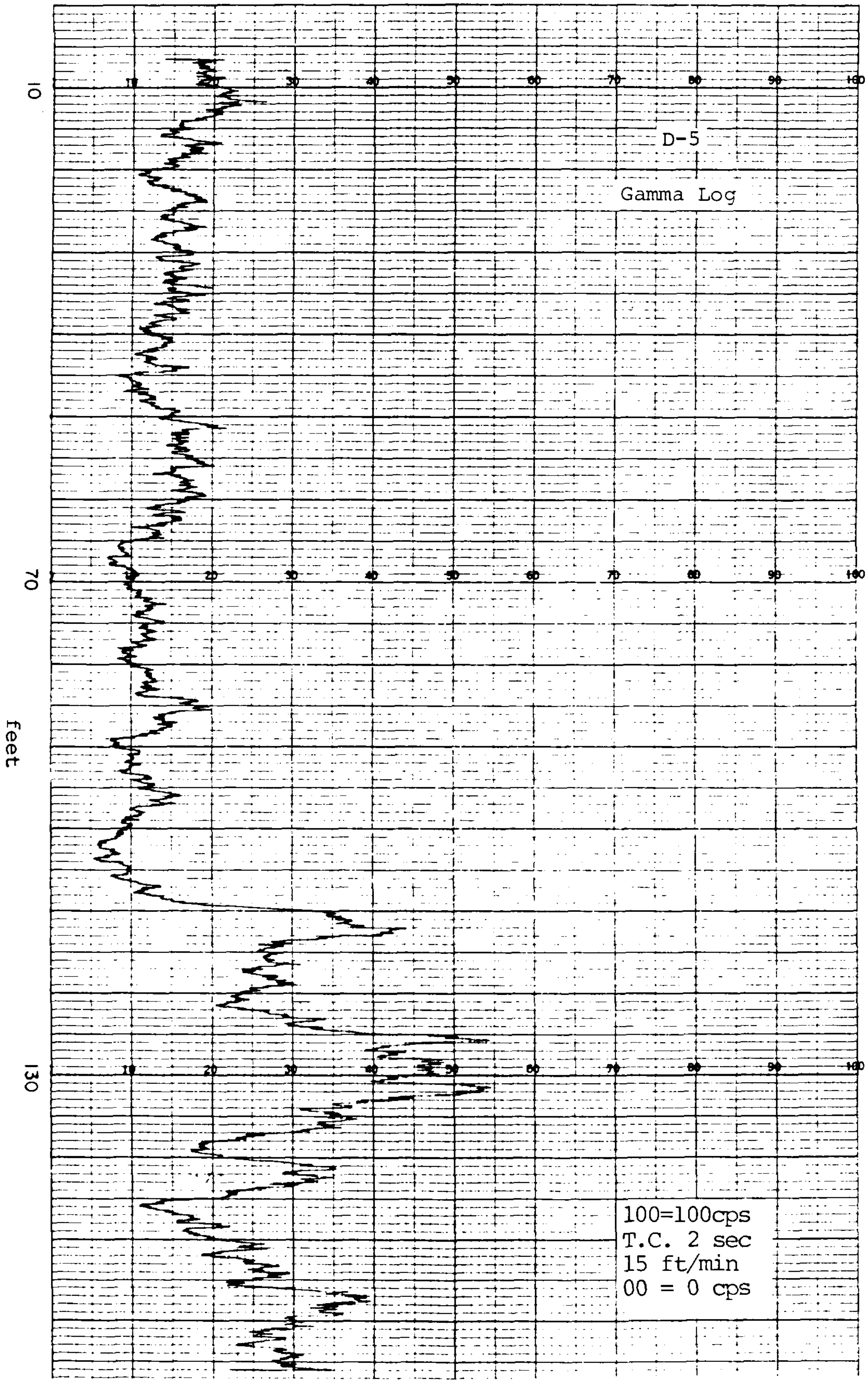
D-5


SP Log
Resistance Log
90
feet
140
160
10
20
30
40
50
60
70
80
90
100
100 mV
20 ohms

302275


D-5
Denisty Log
2.5K cps above SWL
1K cps below SWL
10-inch spacer
T.C. 1 sec
15 ft/min
00 = 0 cps
feet
0
60
120
170
10
20
30
40
50
60
70
80
90

302276



302277

ELMER A. SIGOUIN COMPANY
COAL & WATER WELL EXPLORATION

HOLE Nº D-6
DATE 4/15/85, 4/16/85
OPERATOR Mark J. Sigouin
TRUCK Nº 1
DRILLER

PROJECT AREA Combe Fill South
SEC. TWP. Chester RGE.
COUNTY Morris STATE New Jersey
GEOLOGIST Jeff Thompson
DRILL DEPTH 176.9' HOLE DIA. 6" CASING 6"

	GAMMA DATA RUN 1	GAMMA DATA RUN 2	DENSITY DATA RUN 1	DENSITY DATA RUN 2
LOGGED INTERVAL	entire		entire	
RANGE (5" full scale)	100 cps		2.5K above SWL	1K below SWL
TIME CONSTANT	2 sec.		1 sec.	
LOGGING SPEED	15 ft/min.		15 ft/min.	
HOLE MEDIUM (Air)				
(Water)				
K FACTOR				
CALIBRATED	00 = 0 cps		00 = 0 cps	10" spacer
DRILLING AGENT				
FLUID DENSITY				

HOURLY LOG
ARRIVAL TIME -
STAND BY TIME -
DOWN HOLE TIME
START -
FINISH -
TOTAL TIME ON SITE -

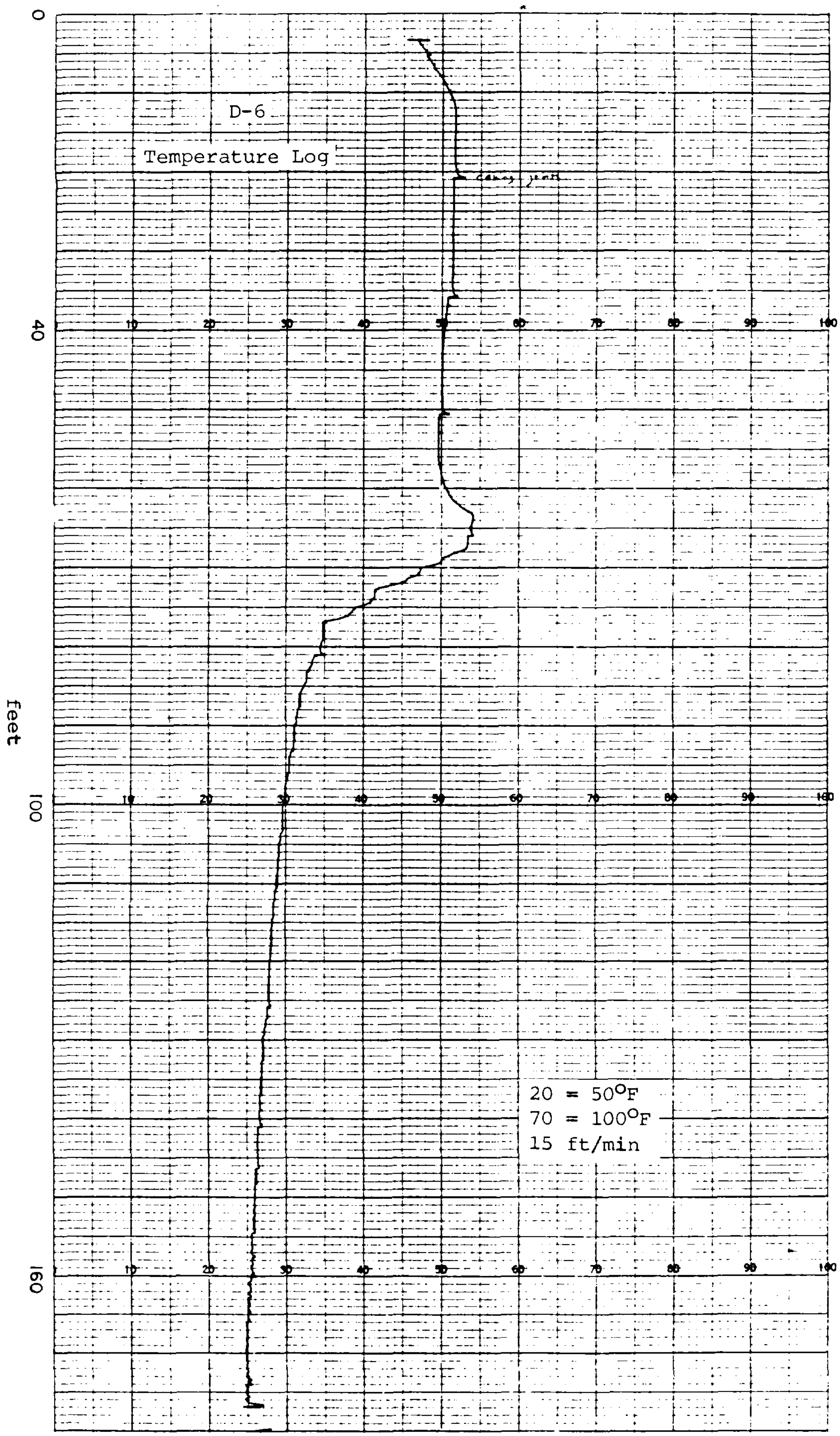
RESISTANCE OHMS PER FULL SCALE (5") 20 ohms
SELF POTENTIAL MILLIVOLTS PER FULL SCALE (5") 400 mV
RES. CONTACT OHMS PER FULL SCALE (5")
CALIPER 40 - 4" dia., 90 = 14" dia.

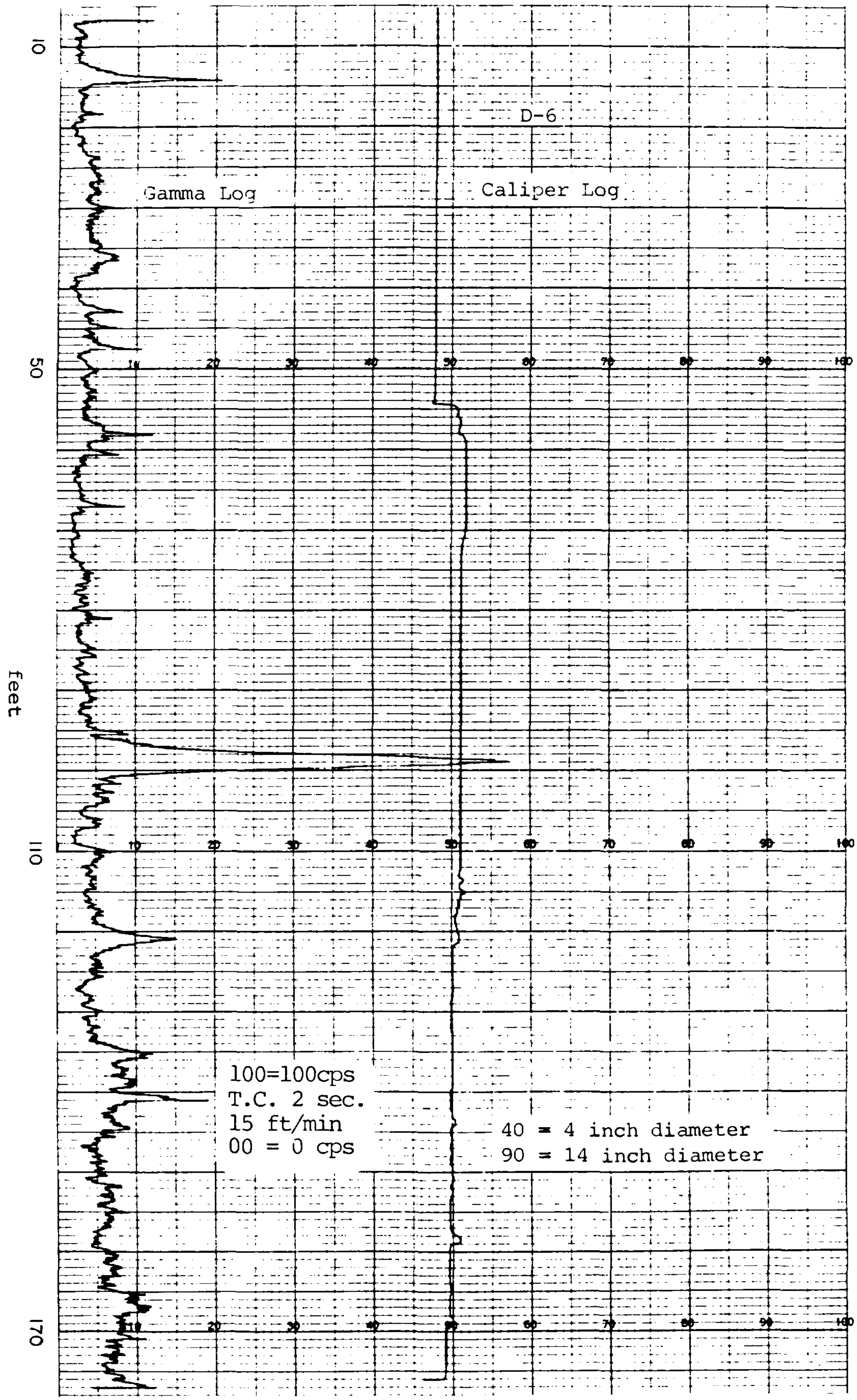
REMARKS: Temperature calibration, 20 = 50°F, 70 = 100°F 15 ft/min. Probes hot when removed from well.

ESA CO.

B-12

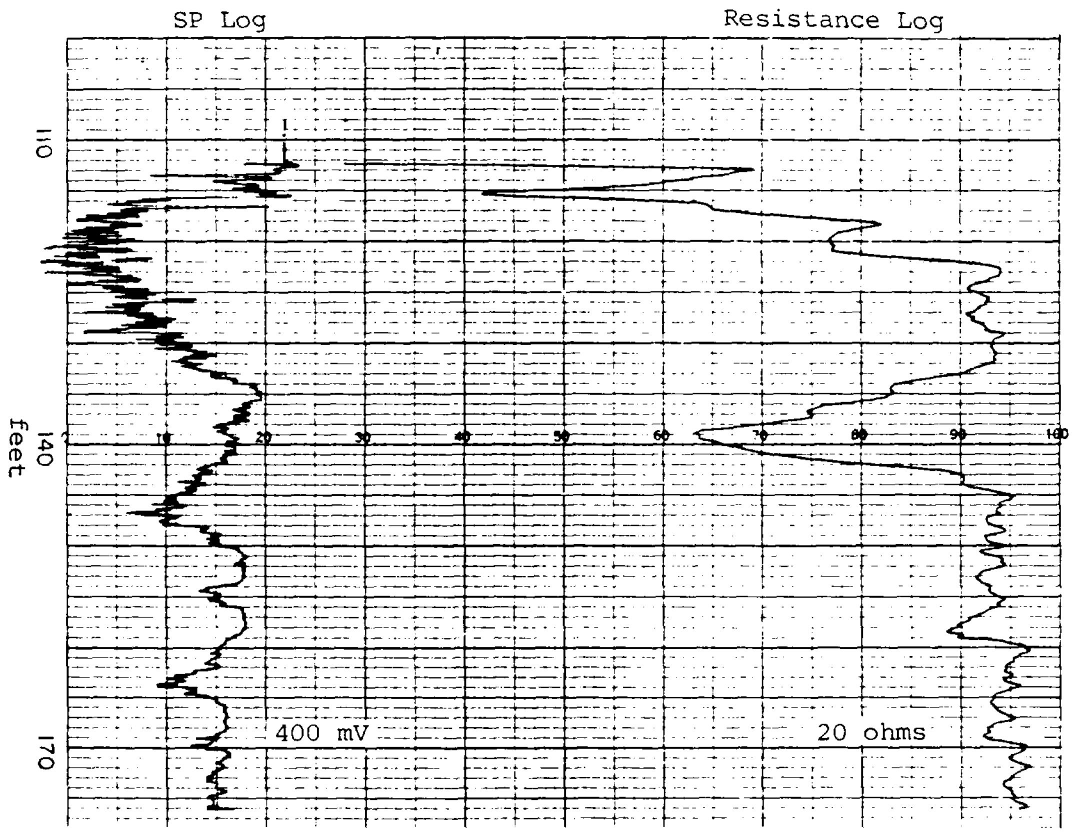
302278


D-6
Temperature Log
20 = 50°F
70 = 100°F
15 ft/min
feet
0
40
100
160
10
20
30
40
50
60
70
80
90
100

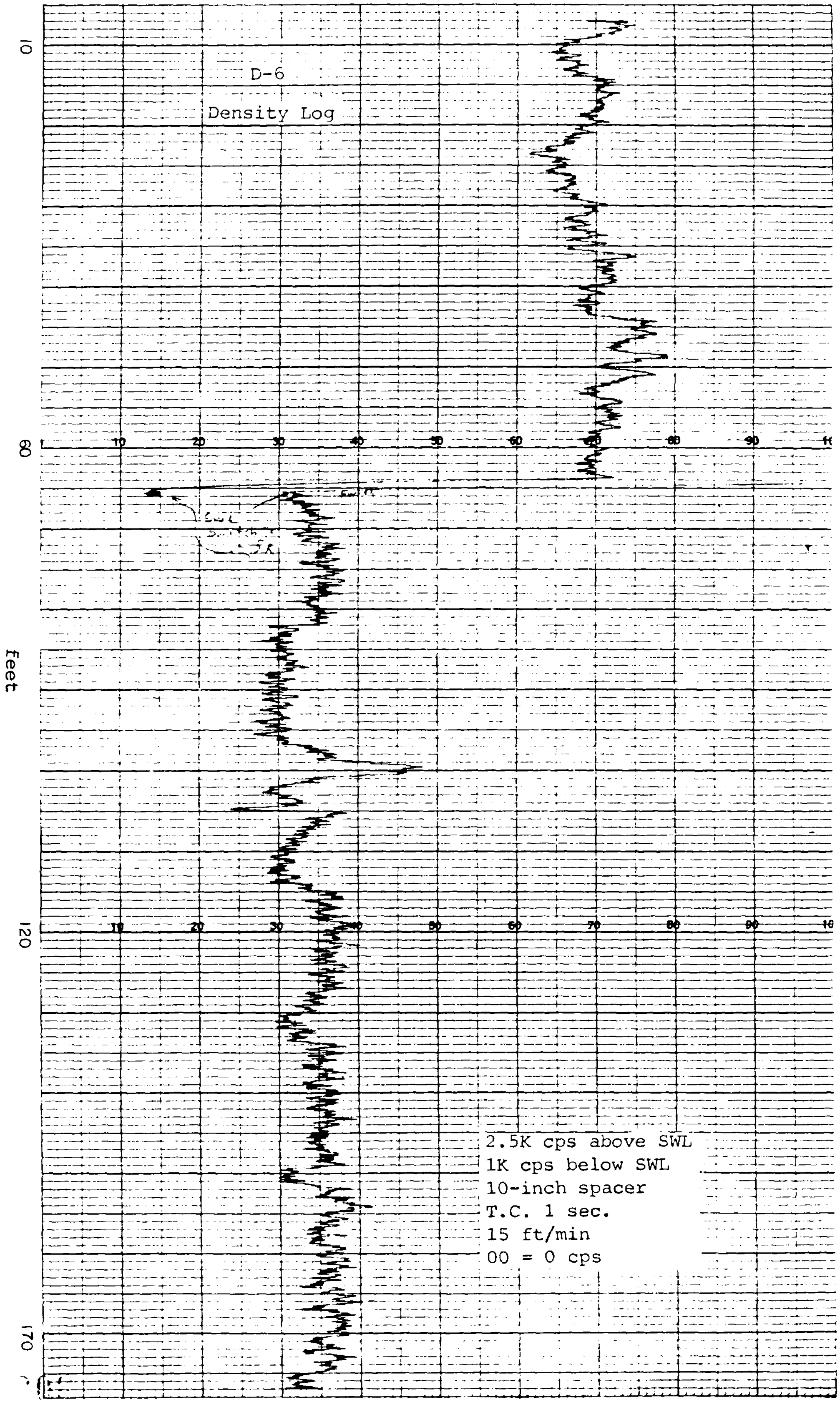

D-6
Gamma Log
Caliper Log
feet
10
50
110
170
10 20 30 40 50 60 70 80 90 100
100=100cps
T.C. 2 sec.
15 ft/min
00 = 0 cps
40 = 4 inch diameter
90 = 14 inch diameter

302280

D-6

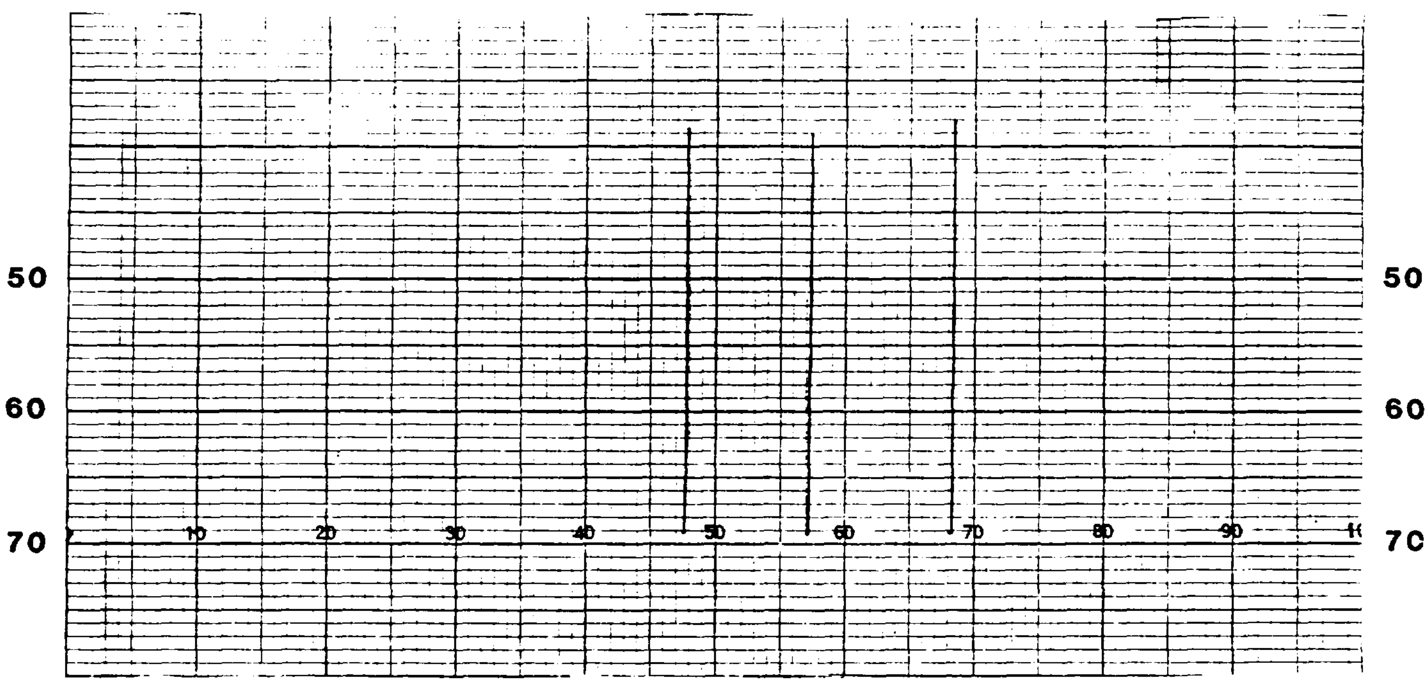

SP Log
Resistance Log
110
140
feet
170
10
20
30
40
50
60
70
80
90
100
400 mV
20 ohms

302281


D-6
Density Log
10
60
120
170
feet
10 20 30 40 50 60 70 80 90
2.5K cps above SWL
1K cps below SWL
10-inch spacer
T.C. 1 sec.
15 ft/min
00 = 0 cps

302282

D-6



REPEAT CALIPER LOGS THROUGH CASING SHOWING ABSENCE OF WRINKLING

302283

ELMER A. SIGOUIN COMPANY
COAL & WATER WELL EXPLORATION

HOLE Nº D-7
DATE 4/15/85, 4/17/85
OPERATOR Mark J. Sigouin
TRUCK Nº 1
DRILLER

PROJECT AREA Combe Fill South
SEC. TWP. Chester RGE.
COUNTY Morris STATE New Jersey
GEOLOGIST Jeff Thompson
DRILL DEPTH 125.9' HOLE DIA. 6" CASING 6"

	GAMMA DATA RUN 1	GAMMA DATA RUN 2	DENSITY DATA RUN 1	DENSITY DATA RUN 2
LOGGED INTERVAL	entire		entire	
RANGE (5" full scale)	100 cps		2.5K cps above SWL	1000K below SWL
TIME CONSTANT	2 sec.		1 sec.	
LOGGING SPEED	15 ft/min.		15 ft/min.	
HOLE MEDIUM (Air)				
(Water)				
K FACTOR				
CALIBRATED	00 = 0 cps		00 = 0 cps	10" spacer
DRILLING AGENT				
FLUID DENSITY				

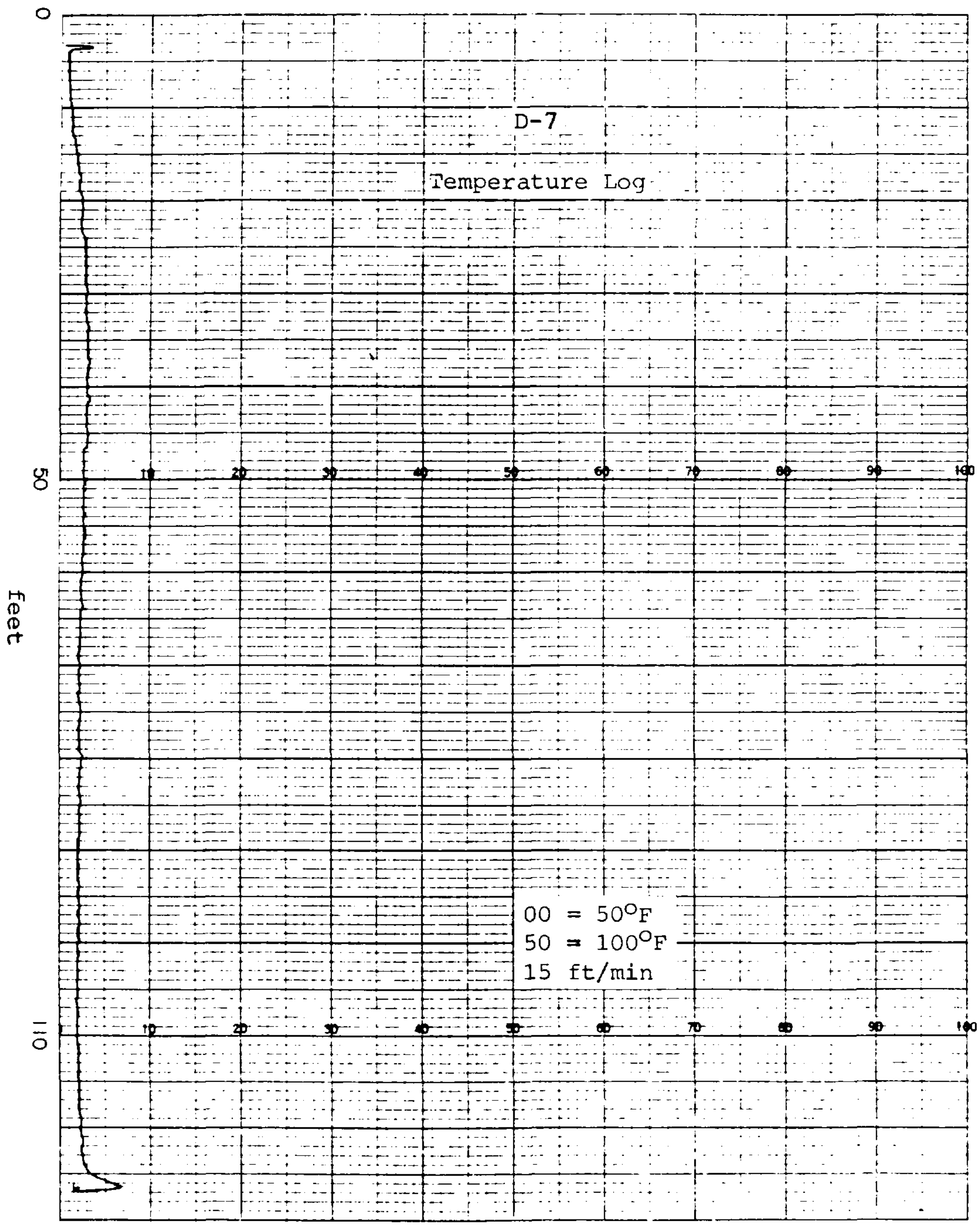
HOURLY LOG	
ARRIVAL TIME -	
STAND BY TIME -	
DOWN HOLE TIME	
START -	
FINISH -	
TOTAL TIME ON SITE -	

RESISTANCE OHMS PER FULL SCALE (5") 20 ohms
SELF POTENTIAL MILLIVOLTS PER FULL SCALE (5") 100 mV
RES. CONTACT OHMS PER FULL SCALE (5")
CALIPER 40 = 4" dia., 90 = 14" dia.
REMARKS: Heavy odor to water. Temperature calibrations, 00 = 50°F, 50 = 100°F, 15 ft/min.

ESA CO.

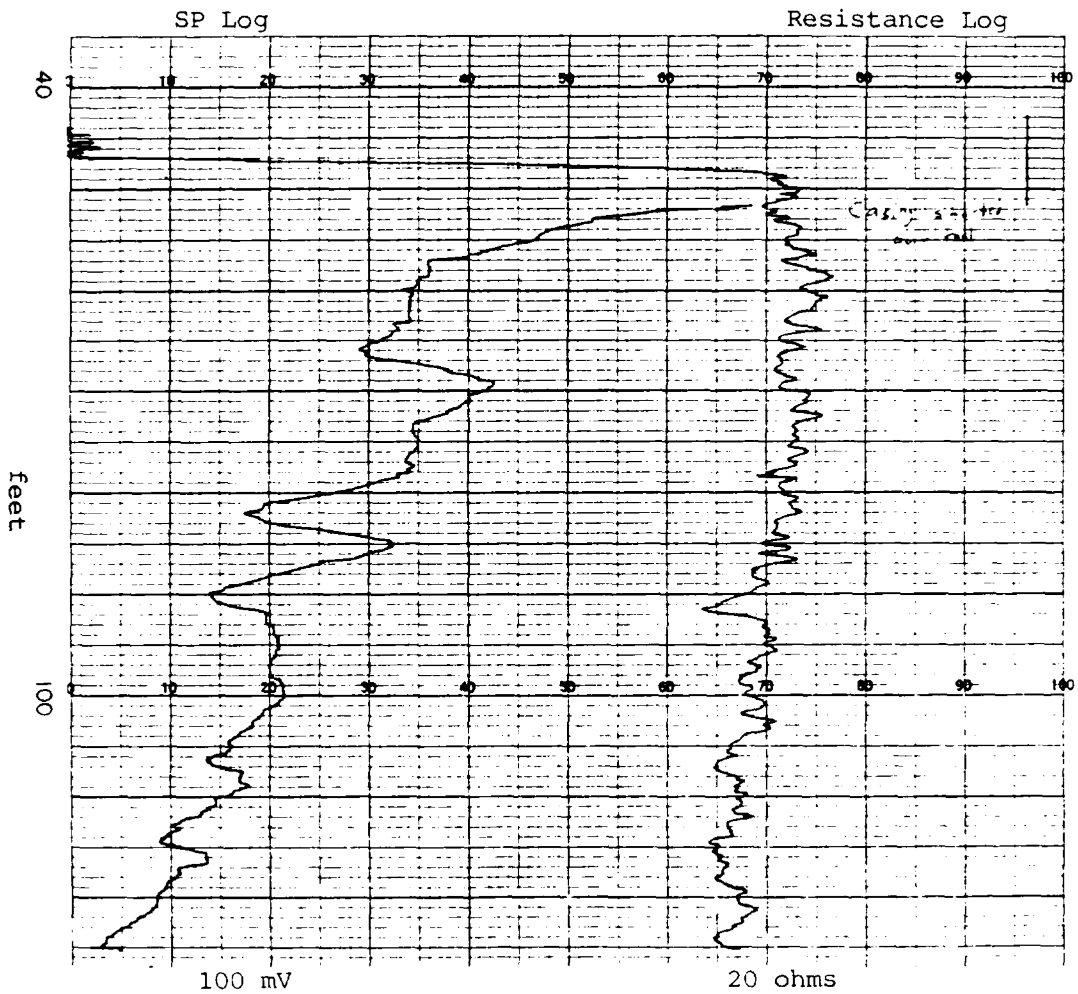
B-18

302284

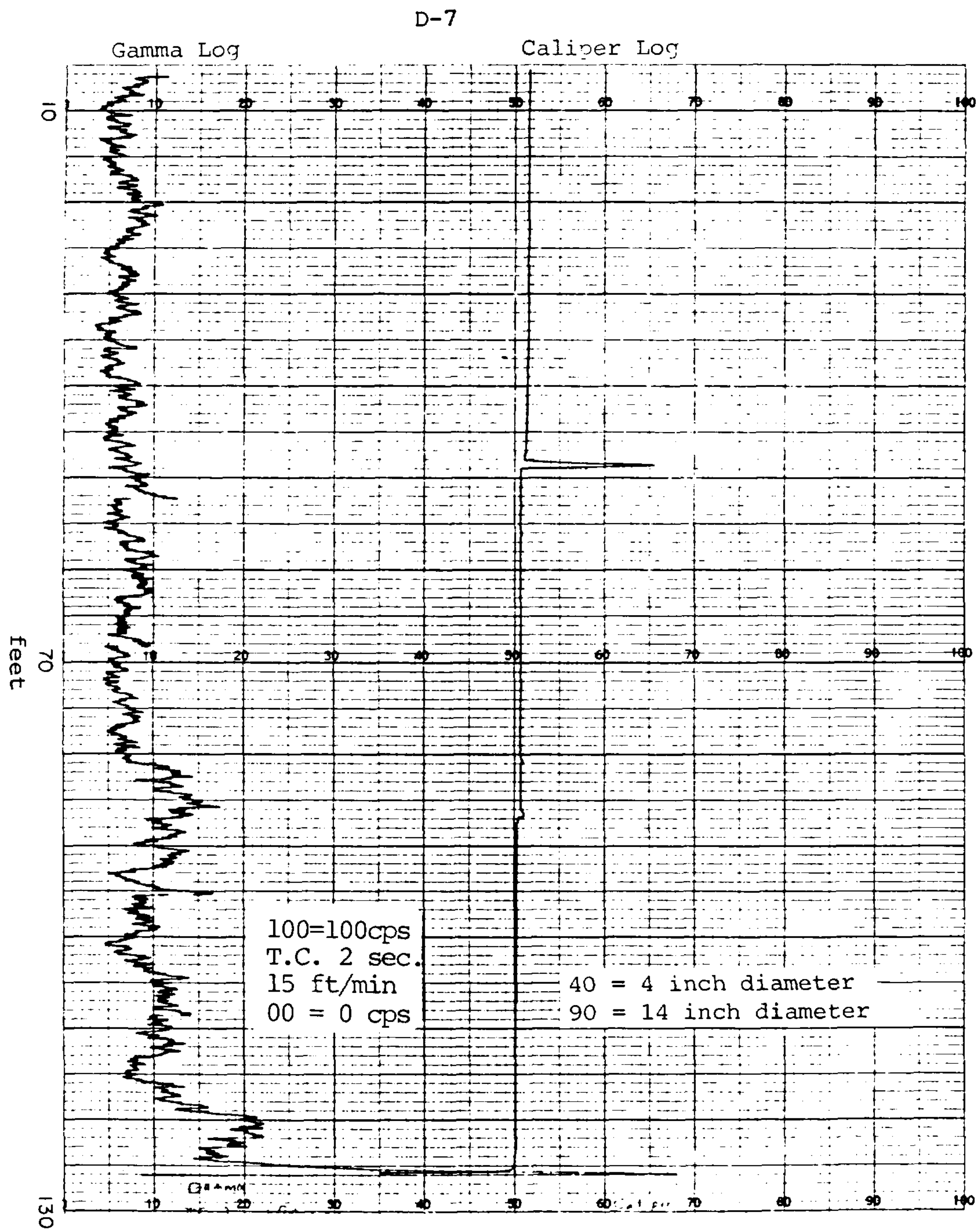

D-7
Temperature Log
00 = 50°F
50 = 100°F
15 ft/min
feet
0
50
110
10
20
30
40
50
60
70
80
90
100

302285

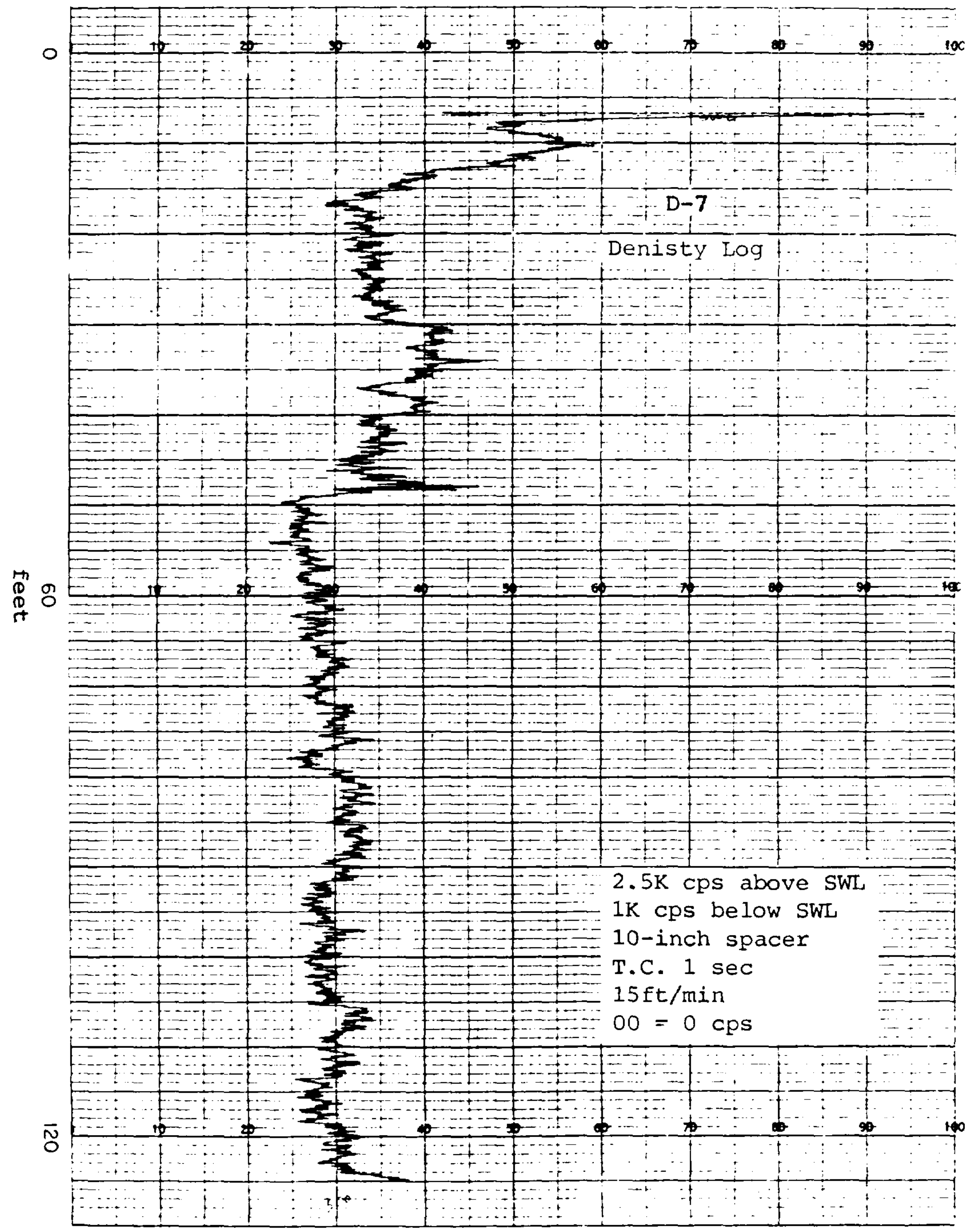
D-7


SP Log
Resistance Log
40
feet
100
0 10 20 30 40 50 60 70 80 90 100
100 mV
20 ohms

302286


D-7
Gamma Log
Caliper Log
feet
10
70
130
100=100cps
T.C. 2 sec.
15 ft/min
00 = 0 cps
40 = 4 inch diameter
90 = 14 inch diameter

302287


D-7
Denisty Log
2.5K cps above SWL
1K cps below SWL
10-inch spacer
T.C. 1 sec
15ft/min
00 = 0 cps
0
60
120
feet
10
20
30
40
50
60
70
80
90
100

302288

APPENDIX C

MEMO ON DESCREPANCIES IN

MONITORING WELL DESIGNATIONS

ON COMBE FILL SOUTH LANDFILL

DATE: 17 October 1984 FILE NO. 455-102

TO: Ruth Maikish

FROM: Andy Hudock

SUBJECT: Discrepancies in Monitoring Well Designations in Combe South Quarterly Report, 1977-1981

INTRODUCTION

A review of the available Combe South quarterly reports submitted to the NJDEP from January 1977 to May 1981 indicates that there exists some discrepancies in monitoring well designations and locations.

The Remedial Action Master Plan (RAMP) for the Combe Fill South site discussed such discrepancies. The RAMP indicated that the well locations are best determined as follows:

- o Well No. 1 - Located at the landfill garage (LMS# DW-1)
- o Well No. 2 - Located in the eastern landfill area (LMS# DW-2) at the crest of the hill near the access road
- o Well No. 3 - Located at the Filiberto Sr. house on (LMS# DW-3) Parker Road
- o Well No. 4 - Located near the northern property (LMS# DW-4) line to the northeast of the powerline easement
- o Well No. 5 - Located 200 feet south of the (LMS# DW-5) southern property line along the powerline easement

However, these descriptions of well locations are different from the descriptions contained in two NJDEP memos.

In an 18 April 1975 NJDEP memo written by Frank Markewicz, the locations of the existing wells were described as:

- o Well No. 1 - Resident House adjacent to office
- o Well No. 2 - Garage Well - east of Resident House

302290

- o Well No. 3 - Well approximately 300 ft east of old landfill and on west side of Tate Road to landfill
- o Well No. 4 - Well on property of J. Filiberto Sr. - located on NW side of Parker Road and SE of landfill

The well that Mr. Markewicz designated as Well No. 1 does not directly correspond to any of the well location descriptions in the RAMP. Mr. Markewicz's Well Nos. 2 and 4 apparently correspond to RAMP well designations for Well Nos. 1 and 3, respectively. The well that Mr. Markewicz designated as Well No. 3 may correspond to the well designated by the RAMP as Well No. 4, although there is some uncertainty regarding this.

In an 18 April 1977 NJDEP memo written by William J. Berk to describe a 13 April 1977 meeting with Mr. Filiberto, Mr. Filiberto identified the monitoring wells locations as follows:

- o Well No. 1 - Located at house adjacent to the landfill office
- o Well No. 2 - Located at the landfill garage
- o Well No. 3 - Located at the Filiberto Sr. house next to the rail fence
- o Well No. 4 - Located in the driveway at the Filiberto Sr. house

The well that Mr. Filiberto designated as Well No. 1 corresponds to the well that Mr. Markewicz designated as Well No. 1. However, no corresponding well is indicated in the RAMP. The well that Mr. Filiberto designated as Well No. 2 corresponds to Mr. Markewicz's Well No. 2 and corresponds to RAMP Well No. 1. The well that Mr. Filiberto designated as Well No. 3 corresponds to RAMP Well No. 3 and possibly to Mr. Markewicz's Well No. 4. The well that Mr. Filiberto designated as Well No. 4 has no obvious counterpart based on well location descriptions in the RAMP or in Mr. Markewicz's well designations.

DATA INTREPRETATION

Based on these two NJDEP memos, there apparently exists two monitoring wells (at the landfill office and at the driveway of the Filiberto, Sr., house) that were not included in the RAMP well location descriptions. The RAMP did not specifically discuss the contents of these two memos. However, these memos were cited in the RAMP list of references and, therefore, it is believed that they were considered in the formulation of the RAMP well designations. The RAMP did summarize, for each well number, the concentration ranges of the chemical constituents found in these quarterly monitoring analyses.

The monitoring well quarterly reports and other sampling analysis generally identify the wells by number and do not describe the location of a particular monitoring well (see Table 1). However, on the following sampling dates, some descriptions of well locations were included with the well numbers reported:

SAMPLING DATE	WELL DESIGNATIONS
27 January 1977	Well No. 1 = office, Well No. 2 = garage, Well No. 3 = Filiberto Sr. house, Well No. 4 = Filiberto Sr. driveway
22 March 1979	Well No. 1, Well No. 2, Well No. 3, garage, Filiberto
17 May 1979	Well No. 1 = garage, Well No. 2, Well No. 3 = Filiberto, Well No. 4, Well No. 5
19 November 1979	Well No. 1 = garage, Well No. 2, Well No. 3 = Filiberto, Well No. 4, Well No. 5
6 May 1981 (NJDEP Sample)	Well No. 1 = garage, Well No. 2

In an effort to make sense of the available sampling information for the landfill monitoring wells, LMS proposes to accept the monitoring well number designations appearing in the quarterly reports as corresponding to the monitoring well locations described in the RAMP. There are two obvious exceptions to this proposed rule of thumb, namely:

1. The sampling results of 27 January 1977 would be discarded for Well Nos. 1 and 4 (as having well locations that do not correspond to RAMP well locations), with Well No. 2 (garage) directing corresponding to RAMP Well No. 1, and Well No. 3 (Filiberto) directly corresponding directly to RAMP Well No. 3.

2. The sampling results of 22 March 1979 would be discarded for Well Nos. 1, 2, and 3, with the wells designated as garage and Filiberto, corresponding directly to RAMP Well Nos. 1 and 3, respectively. Well No. 1, as designated in the 22 March 1979 sampling results, has TDS, hardness, and chloride concentrations that seem to correspond to those of the well designated as Well No. 5 in previous samples. However, other constituent concentrations are such that any attempts to directly match these wells to previous well results could not be done with a high degree of confidence.

CONCLUSIONS

Rather than disregarding the entire set of landfill monitoring well sampling information because of occasional discrepancies regarding well locations, it may be preferable to salvage that information, which does not provide obviously conflicting well designations (as compared to well designation in the RAMP).

Unless additional information (as yet unavailable) dictates otherwise, LMS will accept the monitoring well designations appearing in the quarterly monitoring reports as corresponding to the monitoring well locations described in the RAMP. However, unless additional information is received, the following sampling information will not be used:

SAMPLING DATE	REPORTED WELL DESIGNATION
27 Jan 1977	1
27 Jan 1977	4
22 Mar 1979	1
22 Mar 1979	2
22 Mar 1979	3

Additional information may be forthcoming which may clarify the well information of 27 January 1977 and 22 March 1979. Maps of well locations that were included with the submittal of sampling results to NJDEP for the two dates have been requested from NJDEP by LMS but have not yet been received.

TO: Ruth Maikish
FROM: Andy Hudock

File No. 455-102
Page 5

This proposed use of available monitoring well data was discussed during telephone conversations with Dick Popiel, Dan Toder, and Elissa Stone (all of the NJDEP) on 11 October 1984.

cc: Richard Popiel, NJDEP
Dan Toder, NJDEP
Elissa Stone, NJDEP

302294

TABLE 1

CHRONOLOGICAL LIST OF LANDFILL MONITORING WELL DESIGNATIONS

SAMPLING DATE	WELL LOCATION BY WELL NUMBERS #1	#2	#3	#4	#5
27 Jan 1977	Office	Garage	Filiberto House	Filiberto Driveway	NS
26 Aug 1977	*	*	*	*	*
18 May 1978	*	*	*	*	*
6 Sep 1978	*	*	*	*	*
29 Nov 1978	*	*	*	*	*
22 Mar 1979	*	*	*	Garage[a]	Filiberto[a]
17 May 1979	Garage	*	Filiberto	*	*
21 Aug 1979	*	*	*	*	*
18 Sep 1979	*	NS	*	NS	NS
19 Nov 1979	Garage[a]	*	Filiberto[a]	*	*
26 Feb 1980	*	*	*	*	*
29 May 1980	*	*	*	*	*
5 Sep 1980	*	*	*	*	*
7 Nov 1980	*	*	*	*	*
6 Jan 1981	NS	NS	NS	NS	*
11 Feb 1981	*	*	*	*	*
3 Mar 1981	NS	NS	NS	DEP DW-4	DEP DW-5
6 May 1981	Garage[a]	*	*	*	*
22 May 1981	*	*	*	*	*

* - No location designated.
NS - Not sampled.
[a] - No well number designated.

APPENDIX D

MEMORANDUM FROM DAVE KAPLAN AND JOHN TRELA

OF NJDEP TO HAIG KASSABACH OF NJDEP

APRIL 14, 1982

MEMO NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Haig Kasabach, Chief

FROM DMK Dave Kaplan through John Trela DATE APR 14 1982

SUBJECT Combe Fill South Landfill, Chester, Morris County

1. The above-referenced facility, covering 193.34 acres, started operation in 1971 and closed in 1981. Wastes accepted included: household, industrial, dead animals, sewage sludge, septic tank wastes, chemicals, and waste oil. The trench method was used — individual trenches measuring seventy feet wide by several hundred feet long were excavated into the underlying bedrock. Cover consisted of crushed bedrock. Two monitor wells are on-site; MW4, a 150' rock well, is NE of the landfill, MW5, a 30' sand well, is south of the landfill.

2. The landfill is in a rural area, situated on a hill 100' above the surrounding terrain. Fields are south and west, and wooded areas are north and east. Numerous residential dwellings, with wells, are nearby — on Parker Road (SE), Schoolhouse Lane (NE), and East Valley Brook Road (NW). Adjacent surface waters include: wetlands (NW), Trout Brook (W), and Rheinhart Brook (S). Rheinhart Brook (E. Branch Trout Brook) flows south entering Trout Brook south of Parkers Road. An enclosed sketch of the landfill shows approximate locations of the surface waters, roads, and monitor wells in relation to the landfill.

3. The landfill is situated on residual soils overlying grantitic gneiss bedrock. Twenty-five soil borings and sixteen test pits indicate the following profile: 0-12' of clayey silt; 0-15' of rock rubble, silts, sands, and clays; 0-8' of fractured bedrock, "competent" bedrock . Water depth ranges from 2' to greater than 20' in the borings. Ground-water flow is assumed to following topography, that is, move radially in all directions from the crest of the hill.

4. An inspection was made on March 9, 1981. At that time the landfill was still open. Filling was taking place in the western section — a dragline was excavating new trenches. Wastes were primarily municipal, and cover, crushed gneiss bedrock, was poor. There was uncovered garbage, odors, seagulls were everywhere, and windblown garbage covered adjacent fields and trees. Leachate seeps were visible along the northern landfill face, and puddles of leachate were evident around the landfill toe. The leachate seeps, red and black colored, some with an oil sheen, flowed toward the headwaters of Trout Brook. Trout Brook is "dead" — leachate entering it gives it a red color and encourages the growth of Sphaerotilus. Leachate also seeps into Rheinhart Brook, turning it a reddish color.

5. Because of the possibility of leachate from the landfill polluting nearby potable wells, a sampling program was instituted. Analyses were made on water taken from: residential wells on East Valley Brook Road, Schoolhouse Lane, and Parker Road; Monitor wells #4 and #5; and Trout Brook and Rheinhart Brook. A table is enclosed summarizing the analyses results for total volatile organics, acid and base neutral extracts, pesticides, and PCB's. (The table includes the most recent data available to the Bureau of Ground Water Management).

302297

Re: Combe Landfill

6. Results

The results show significant organic contamination of ground and surface waters adjacent to the landfill. Both monitor wells (shallow and deep) are polluted, as are Trout Brook and Rheinhart Brook. (No samples were available for the wetlands north of the landfill). However, at present, it appears that contaminated ground water has not reached any of the near-by potable wells. Of fifteen wells sampled, none exceeded the 100 ppb total volatile organics threshold used by the Bureau of Potable Water to close wells.

7. Conclusions and Recommendations

The hydrology beneath the Combe Fill South Landfill is very complex. Ground water flow, in general, follows topography, moving radially in all directions away from the crest of the hill on which the landfill sits. However, ground water within the highly fractured bedrock will not follow topography, but will flow along fracture zones, which may be oriented in any direction.

Therefore, leachate formed within the landfill will move away in all directions. There is no single flow direction or distinct leachate plume. Additional monitor wells would probably be of little value in defining the problem, since it would be impossible to monitor all fracture zones beneath the landfill (any of which may be a conduit for leachate escaping from the landfill).

To reduce leachate formation at the landfill, and thus also reducing the possibility of future potable well contaminations, I recommend that the landfill be capped with an impermeable material (preferably with 10^{-7} clay). Also, to detect contamination of wells, representative homes (selected by the Bureau of Ground Water Management) on East Valley Brook Road, Schoolhouse Lane, and Parker Road should have their wells tested quarterly for volatile organics.

WQM32:clb

cc: Frank Markewicz
William Althoff
Barker Hamill
Dan Toder
Files (3)

Enclosure

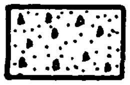
302298

APPENDIX E

SOIL BORING/ROCK CORING GEOLOGIC LOGS

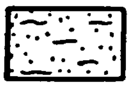
(SB-SERIES WELLS)

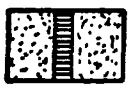
Well Construction Symbols for SB-Series Wells

 Portland Cement Grout

 Bentonite Slurry with PVC Solid

 Peltonite Seal

 Caved Formation

 Sand Pack with PVC Screen

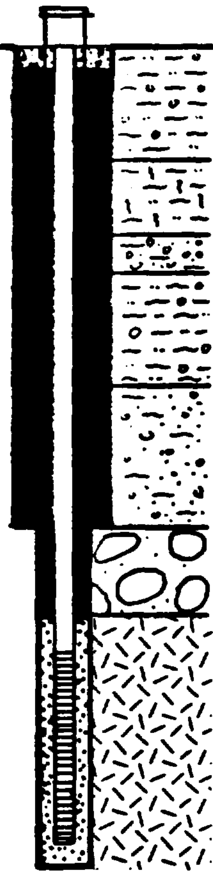
Abbreviations for SB-Series Wells

(chem):	indicates soil sample submitted for chemical analysis
G.S.:	ground surface
T.O.C.:	top of casing
(unc.):	unconsolidated

Combe-Fill South Landfill
Project 8455

Piezometer SB-1

Depth in feet	Blow Ct./ Recovery	Sample No./ Run No.
0	12-27-35-39/.3'	S-1
	57-85-100(.4)/.5'	S-2
	27-35-45-50/.7'	S-3
	100(.5)/.3'	S-4
	3-27-26-26/1'	S-5
10	17-18-21-29/.7'	S-6
	55-100(.4)/.2'	S-7
	85-107(.5)/.6'	S-8
	18-21-27-28/1'	S-9
20	35-47-60-78/1.3'	S-10
	100(.2)/.2'	S-11
	100(.3)/.2'	S-12
	65-100(.3)/.1'	S-13
	.9'	S-14
30	Augered	No Sample
	1.0'	Run 1
	2.0'	Run 2
	1.0'	Run 3
40	3.0'	Run 4
43.5		



Description

Medium brown sandy, gravelly silt. (ML)

Medium brown gravelly, clayey silt. (ML)

Medium brown silty gravel, trace sand. (GW)

Medium to orangish-brown sandy, gravelly silt. (ML)

Medium to grayish-brown silty, gravelly sand. Saprolite (SW)

Granite - Greenish-gray to white. Boulder

Dark green hornblende granite.

Vertical Scale
1" = 10'

Drilling Began: 11/29/84
Drilling Completed: 12/3/84
Well Construction Completed: 12/4/84
Driller: Empire Soils Investigation
Geologist: RCW/JST
Well Type: Soil Boring/Piezometer (rock)
Screened Interval: 32-42'

Total Depth: 43.5'
Depth to Competent Bedrock: 27-30'
Elevation T.O.C.: 850.35
Elevation G.S.: 848.35
SWL(Date): 815.89 (1/29/85)

Combe-Fill South Landfill
Project 8455
Safety Instrument Readings
Piezometer SB-1

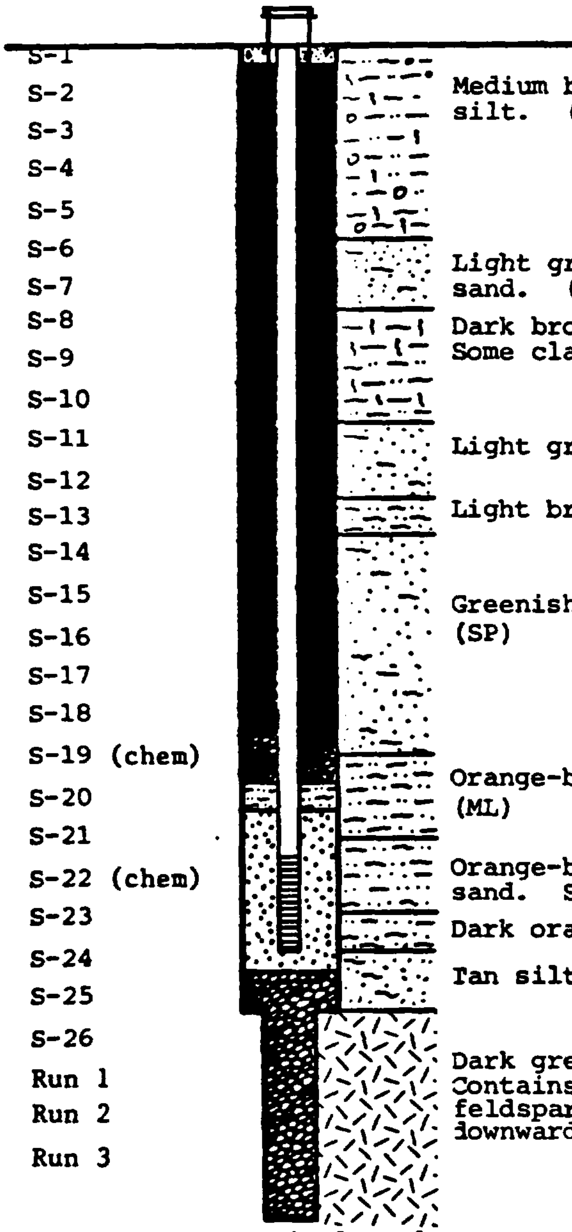
Depth in Feet	Sample No./ Run No.	HNU	EXP	RAD
		1-0B	0-1% B	.035 B
0 - 2	S-1	0	0%	0
2 - 4	S-2	0	0%	0
4 - 6	S-3	0	0%	0
6 - 8	S-4	0	0%	0
8 -10	S-5	0	0%	0
10 -12	S-6	0	0%	0
12 -14	S-7	0	0%	0
14 -16	S-8	0	0%	0
16 -18	S-9	0	0%	0
18 -20	S-10	0	0%	0
20 -22	S-11	0	0%	0
22 -24	S-12	0.2	0%	0
24 -26	S-13	0.6	0%	0
26 -26.9	S-14	0	0%	0
26.9-33.5	No Sample	NT	NT	NT
33.5-34.5	Run 1	0	NT	0
34.5-36.5	Run 2	0	NT	NT
36.5-37.5	Run 3	0	NT	NT
37.5-43.5	Run 4	0	NT	NT

Note: No samples sent for chemical analysis on SB-1.
Readings are all listed as values above background levels.

Combe-Fill South Landfill
Project 8455

Piezometer SB-2

Depth in feet	Blow Ct./ Recovery	Sample No./ Run No.	Description
0	5-7-8-11/1'	S-1	
	37-100(.4)/.5'	S-2	Medium brown sandy, gravelly, clayey silt. (ML)
	17-18-15-13/.2'	S-3	
	13-12-10-9/1.8'	S-4	
	11-12-14 -14/.5'	S-5	
10	9-9-10-9/1.8'	S-6	
	12-13-14-14/1.25'	S-7	Light gray silty sand, fine to coarse sand. (SW)
	7-9-11-16/1.7'	S-8	Dark brown sandy, clayey silt. (ML) Some clay, some sand, much silt.
	11-12-15-19/2'	S-9	
	8-8-9-10/1.5'	S-10	
20	11-13-15-19/None	S-11	Light gray silty sand. (SP)
	21-37-43-50/.3'	S-12	
	19-21-27-28/1.5'	S-13	Light brown sandy silt. (ML)
	21-37-45-60/1.5'	S-14	
	14-21-27-29/1.25'	S-15	Greenish-gray silty sand. Saprolite (SP)
30	23-25-28-30/1'	S-16	
	24-25-25-21/.6'	S-17	
	12-13-15-18/.5'	S-18	
	20-50-48-33/2'	S-19 (chem)	Orange-brown sandy silt. Saprolite. (ML)
40	3-4-7-6/1'	S-20	
	7-14-35-60/.9'	S-21	
	35-37-39-40/.1'	S-22 (chem)	Orange-brown to greenish-gray silty sand. Saprolite. (SM)
	11-15-21-25/1.5'	S-23	Dark orange-brown sandy silt. (ML)
	55-100(.2)/.5'	S-24	Tan silty sand. Saprolite. (SM)
50	100(.2)/.2'	S-25	
	100(.5)/.5'	S-26	
	3.1'	Run 1	Dark green, hornblende granite. Contains hornblende, quartz and feldspar. Becomes less mafic downward.
	3.5'	Run 2	
	3'	Run 3	
60			
62			



Vertical Scale
1" = 10'

Drilling Began: 11/20/84
Drilling Completed: 11/21/84
Well Construction Completed: 11/26/84
Driller: Empire Soils Investigation
Well Type: Soil Boring/Piezometer (unc)
Screened Interval: 43-48'

Total Depth: 62'
Depth to Competent Bedrock: 51'
Elevation T.O.C.: 812.76
Elevation G.S.: 810.76
SWL(Date): 793.38 (1/29/85)

Combe-Fill South Landfill
Project 8455
Safety Instrument Readings
Piezometer SB-2

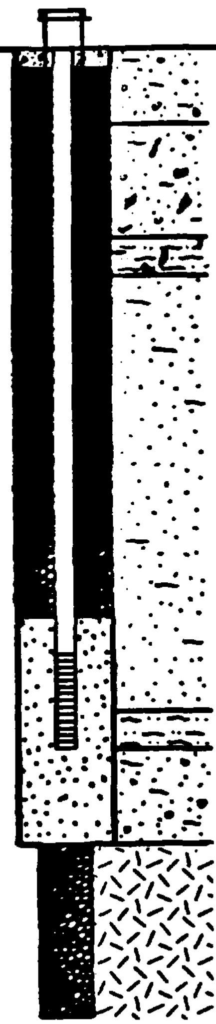
Depth in Feet	Sample No./ Run No.	HNU	EXP	RAD
		1-ØB	1% B	.Ø3B
Ø - 2	S-1	Ø	Ø%	Ø
2 - 4	S-2	Ø	Ø%	Ø
4 - 6	S-3	Ø	Ø%	Ø
6 - 8	S-4	Ø	Ø%	Ø
8 -1Ø	S-5	Ø	Ø%	Ø
1Ø -12	S-6	Ø	Ø%	Ø
12 -14	S-7	Ø	Ø%	Ø
14 -16	S-8	Ø	Ø%	Ø
16 -18	S-9	Ø	Ø%	Ø
18 -2Ø	S-1Ø	2.Ø	Ø%	Ø
2Ø -22	S-11	Ø	Ø%	Ø
22 -24	S-12	Ø	Ø%	Ø
24 -26	S-13	Ø	Ø%	Ø
26 -28	S-14	Ø	Ø%	Ø
28 -3Ø	S-15	Ø.6	Ø%	Ø
3Ø -32	S-16	Ø.6	Ø%	Ø
32 -34	S-17	1.4	Ø%	Ø
34 -36	S-18	Ø	Ø%	Ø
36 -38	S-19 (chem)	3.4	Ø%	Ø
38 -4Ø	S-2Ø	1.Ø	Ø%	Ø
4Ø -42	S-21	Ø.4	Ø%	Ø
42 -44	S-22 (chem)	5.4	Ø%	Ø
44 -46	S-23	Ø.4	Ø%	Ø
46 -48	S-24	1.6	Ø%	Ø
48 -48.5	S-25	NT	NT	NT
5Ø -5Ø.2	S-26	NT	NT	NT
5Ø.2-62	Runs 1-3	NT	NT	NT

Note: Readings are all listed as values above background levels.

Combe-Fill South Landfill
Project 8455

Piezometer SB-3

Depth in feet	Blow Ct./ Recovery	Sample No./ Run No.
0	6-7-6-5/.4'	S-1
	6-7-8-6/.1'	S-2
	6-8-13-11/.2'	S-3
	50-37-29-19/.05'	S-4
	65(.4)/None	S-5
10	60-100(.2)/.4'	S-6
	29-37-96-74/.75'	S-7 (chem)
	100(.4')/.4'	S-8
	39-57-100(.4)/.5'	S-9
	85-100(.2)/.5'	S-10
20	88-100(.1)/.5'	S-11
	37-57-88-83/1'	S-12
	39-49-88-89/1.25'	S-13
	35-45-59-100(.4)/1.25	S-14
30	45-87-100/1'	S-15 (chem)
	45-85-100(.2)/1'	S-16
	47-67-93-100(.3)/1'	S-17
	55-79-100(.2)/1'	S-18
	85-100(.2)/1.5'	S-19
40	100(.2)/.2'	S-20
	100(.1)/.1'	S-21
	3.4'	Run 1
	4.9'	Run 2
50		
51		



Vertical Scale
1" = 10'

Description

Medium to dark brown silty, gravelly sand. (SW)

Dark brown silty, gravelly sand. Much garbage. (SW)

Medium brown sandy silt. Much garbage. (ML)

Light gray silty sand. Saprolite. (SW)

Orangish-brown sandy silt. (ML)

Light gray silty, gravelly sand. Saprolite (SW)

Granite - light bluish-white to black. Contains quartz, hornblende and feldspars.

Drilling Began: 11/14/84
Drilling Completed: 11/19/84
Well Construction Completed: 11/19/84
Driller: Empire Soils Investigation
Well Type: Soil Boring/Piezometer (unc)
Screened Interval: 32-37'

Total Depth: 51'
Depth to Competent Bedrock: 42'
Elevation T.O.C.: 815.01
Elevation G.S.: 813.01
SWL(Date): 793.59 (1/29/85)

455T3

Combe-Fill South Landfill
Project 8455
Safety Instrument Readings
Piezometer SB-3

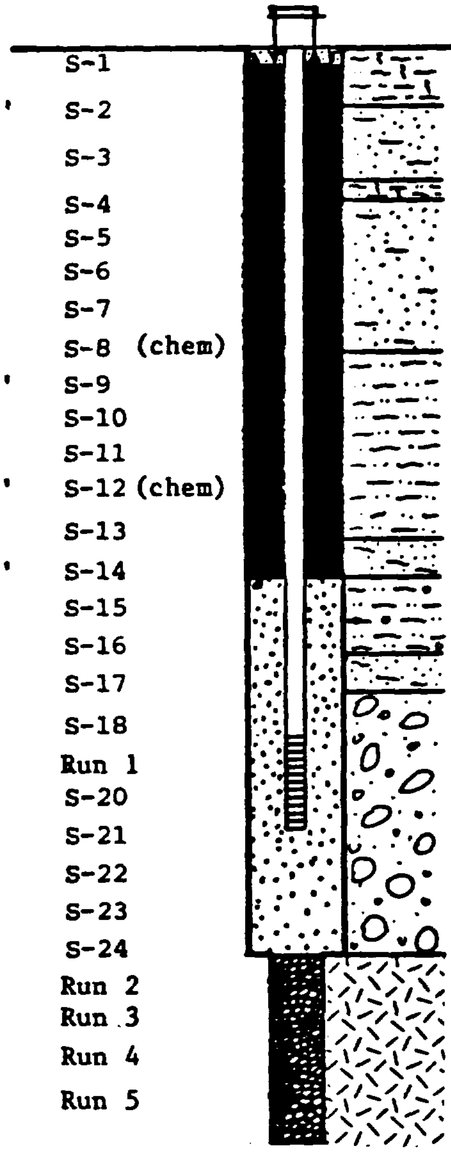
Depth in Feet	Sample No./ Run No.	BNU	EXP	RAD
		Ø-1.ØB	Ø-2% B	.Ø4B
Ø- 2	S-1	4.Ø	Ø%	Ø
2- 4	S-2	Ø	Ø%	Ø
4- 6	S-3	5.Ø	Ø%	Ø
6- 8	S-4	Ø.4	Ø%	Ø
8-1Ø	S-5	NT	NT	NT
1Ø-12	S-6	3.4	Ø%	NT
12-14	S-7 (chem)	8.Ø	Ø%	NT
14-16	S-8	Ø	Ø%	NT
16-18	S-9	NT	NT	NT
18-2Ø	S-1Ø	Ø	Ø%	NT
2Ø-22	S-11	NT	NT	NT
22-24	S-12	Ø	Ø%	Ø
24-26	S-13	Ø	Ø%	Ø
26-28	S-14	NT	Ø%	Ø
28-3Ø	S-15 (chem)	NT	Ø%	Ø
3Ø-32	S-16	NT	Ø%	Ø
32-34	S-17	NT	Ø%	Ø
34-36	S-18	Ø	Ø%	Ø
36-38	S-19	NT	Ø%	Ø
38-4Ø	S-2Ø	NT	NT	NT
4Ø-42	S-21	6.Ø	Ø%	Ø
42-46	Run 1	Ø	Ø%	Ø
46-51	Run 2	NT	NT	NT

Note: Readings are all listed as values above background levels.

Combe-Fill South Landfill
Project 8455

Piezometer SB-4

Depth in feet	Blow Ct./ Recovery	Sample No./ Run No.
0	3-4-5-5/.8'	S-1
	12-15-19-23/.5'	S-2
	7-6-5-6/.3'	S-3
	7-7-7-8/1'	S-4
10	3-5-7-8/.5'	S-5
	9-11-13-15/1'	S-6
	7-8-8-9/None	S-7
	3-7-9-11/1.2'	S-8 (chem)
	9-11-13-14/1.1'	S-9
20	5-6-6-7/1'	S-10
	7-9-11-11/.9'	S-11
	8-12-15-25/1.2'	S-12 (chem)
	8-8-11-13/.8'	S-13
	21-27-35-33/.8'	S-14
30	35-100(.3)/.6'	S-15
	45-70-88-96/1'	S-16
	100(.3)/.3'	S-17
	100(.1)/None	S-18
	1.3'	Run 1
40	Augered	S-20
	100(.1)/.1'	S-21
	100(.3)/None	S-22
	100(.1)/.1'	S-23
	100(.1)/None	S-24
50	1.3'	Run 2
	2.6'	Run 3
	3'	Run 4
	2.5'	Run 5
58		



Description

Dark grayish-brown sandy, clayey silt. (ML)

Light grayish-brown silty sand. (SW)

Light orangish-brown sandy, clayey silt (ML)

Light brown silty sand. (SW)

Light brown to greenish-gray sandy silt. Saprolite. (ML)

Greenish-gray silty sand. Saprolite. (SW)

Multi-colored sandy, gravelly silt. Saprolite. (ML)

Multi-colored silty sand. Saprolite. (SW)

Greenish-gray rounded gravel and boulders with a silty sand. Saprolite. (SW)

Granite greenish-gray with black minerals interspersed. More quartz and less feldspar downward. Much hornblende throughout.

Vertical Scale
1" = 10'

Drilling Began: 11/27/84
Drilling Completed: 11/28/84
Well Construction Completed: 11/28/84
Driller: Empire Soils Investigation
Geologist: RCW
Well Type: Soil Boring/Piezometer
Screened Interval: 36-41'

Total Depth: 58'
Depth to Competent Bedrock: 48'
Elevation T.O.C.: 794.15
Elevation G.S.: 792.15
SWL(Date): 789.27 (1/29/85)

Combe-Fill South Landfill
Project 8455
Safety Instrument Readings
Piezometer SB-4

Depth in Feet	Sample No./ Run No.	HNU	EXP	RAD
0 - 2	S-1	0-1.0	0%	0
2 - 4	S-2	0	0%	0
4 - 6	S-3	0	0%	0
6 - 8	S-4	0	0%	0
8 -10	S-5	2.6	0%	0
10 -12	S-6	5.0	NT	0
12 -14	S-7	3.0	NT	0
14 -16	S-8 (chem)	2.5	0%	0
16 -18	S-9	1.0	0%	0
18 -20	S-10	0.4	NT	0
20 -22	S-11	1.4	NT	0
22 -24	S-12 (chem)	1.6	NT	0
24 -26	S-13	1.6	0%	0
26 -28	S-14	NT	NT	0
28 -30	S-15	NT	0%	0
30 -32	S-16	NT	0%	0
32 -34	S-17	NT	0%	0
34 -34.1	S-18	NT	0%	0
34.1-39.1	Run 1	NT	0%	0
39.1-40	S-19	NT	NT	NT
40 -42	S-20	0	0%	0
42 -44	S-21	NT	NT	NT
44 -46	S-22	0	0%	NT
46 -48	S-23	NT	NT	NT
48 -49.5	Run 2	NT	NT	NT
49.5-52.5	Run 3	NT	NT	NT
52.5-55.5	Run 4	0	0%	0
55.5-58 5	Run 5	NT	NT	NT

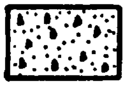
Note: Readings are all listed as values above background levels.

APPENDIX F-1

GEOLOGIC WELLS LOGS FOR DEEP

BEDROCK MONITORING WELLS

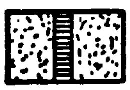
Well Construction Symbols for Deep Bedrock Wells

 Portland Cement Grout

 Bentonite Slurry with stainless steel solid

 Peltonite Seal

 Caved Formation

 Sand Pack with stainless steel screen (not applicable)

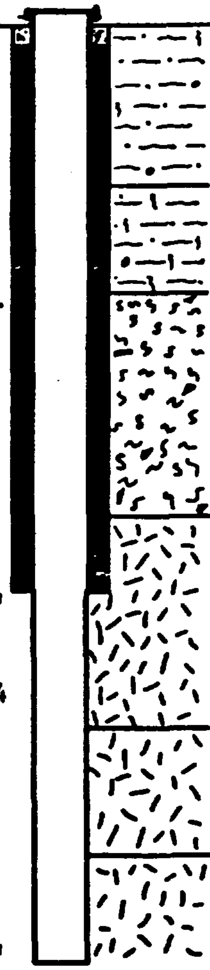
B:	Indicates a Background Measurement
EXP:	Explosimeter Readings (values in percent explosive/readings taken at top of casing.
G.S.:	Ground Surface
HNU:	Measurements made for organic vapor content using an HNU vapor analyzer (values in parts per million/readings taken at top of casing).
N:	Readings not above background level reading (many times this value equals Ø).
NR/NT:	No measurements made due to either; lack of time, instrument malfunction, or inavailability of instrument.
RAD:	Radiation measurements made using a Radiation Alert detector (values in mili-roentgens per hour/readings taken on soil and rock samples).
SCH1Ø:	Schedule 1Ø Casing
S.S.:	Stainless Steel
T & C:	Threaded and Coupled Casing
T.O.C.:	Top of Casing
WBZ:	Water Bearing Zone
WZN:	Weathered Rock Zone

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-1

DEPTH	HNU	EXP	RAD
0	0.8B	0%B	.03B
10	0	0%	N
20	0	0%	N
30	0	0%	.03
40	NR	NR	NR
50	NR	NR	NR
60	0.8B 0	0%B 0%	.03B N
70	0	0%	N
80	NR	NR	NR
90	NR	NR	NR
	NR	NR	NR
110	0	0%	N
120	0.2	0%	.03
130	NR	NR	NR
140	NR	NR	NR
147	0.2	0%	.03

COMMENTS

Cement grout seal to 3'.
Annular space backfilled with bentonite slurry and bentonite pellets. (3'-89')
10" hole 0'-89'.
Much water (15-20 gpm) in overburden.
91' of 6" dia., SCH10, s.s. casing set at 89'.
6" hole 89' to 147'
Possible WBZ 95' (trace)
WBZ 99'-102' (1 1/4 gpm) WZN 104'.
WBZ 109' (mud filled 1 3/4 gpm).
WZN 111' - 114'.
WZN 120'.
WZN 126 - 128'
Possible WBZ 136' (trace)
WZN 141'
Bottom of Well 147'



LITHOLOGIC DESCRIPTION

Orange brown to brown, sandy clayey silt; gravelly, sand fine to coarse, (ML) dry.

Same as above but increased clay content. Material becoming saturated around 25'. Cohesive.

Yellow brown to green brown, highly weathered granite saprolite with much granitic sand. Sand is coarse to fine. Very soft, wet.

White to yellow brown to gray granite. Highly weathered in zones with several mud seams. Much quartz and feldspar. Some pyrite.

Light green gray to green hornblende granite (or amphibolite). Much pyrite. Weathered zones. Trace purple quartz.

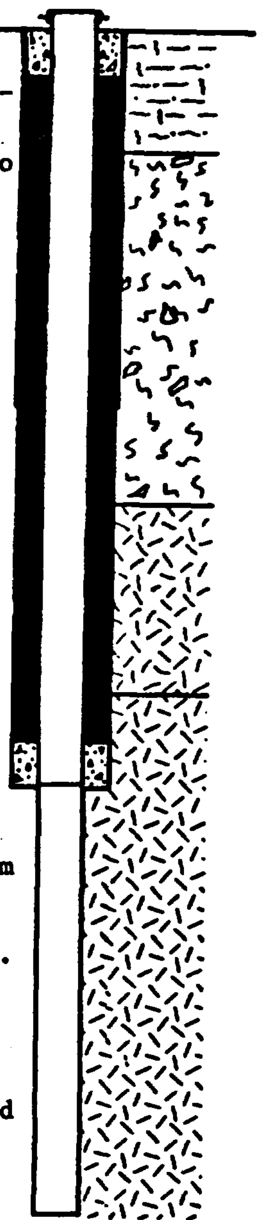
Dark green hornblende granite. Much hornblende. Many metallic minerals (pyrite, etc.). Fairly hard.

Drilling Began: 11/13/84
Drilling Completed: 11/19/84
Well Construction Completed: 11/19/84
Development Completed: 11/19/84
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Deep Rock/Granite
NJ DEP Permit No. 2525632

Total Depth: 147'
Depth to Bedrock: 77'
Depth to Competent Bedrock: 82'
Elevation T.O.C.: 837.72'
Elevation G.S.: 836.01'
SWL(DATE): (1/29/85) 812.49'
Yield: 2.5 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-2

DEPTH	HNU	EXP	RAD	COMMENTS
0	1.2B	0%B	.02B	Cement grout seal to 3'.
10	0.2	0%	.03	Annular space back-filled with bentonite slurry which had cement added to the lower 3-4'. (3' to 80').
20	0.2	0%	N	10" hole to 80'.
30	0.2	0%	N	10" steel casing to 40'.
40	0.6	0%	N	Slight odor to water. 15-20 gpm in over-burden.
50	0.4	0%	N	
60	NR	NR	NR	82.08' of 6" dia., SCH10, s.s. casing set at 80'.
70	0.2	0%	N	6" hole from 80' to 124.5'
80	NR	NR	NR	
90	0.6	NR	NR	Many small WZN from 80' to 100'.
100	0.6	NR	NR	WBZ 99-100 (1 gpm).
110	NR	NR	NR	WBZ 110-111' (5-7 gpm). Mud and sand filled seam.
120	1.0	0%	N	Strong odor to water.
124.5	1.4	0%	N	WZN 123'. Bottom of well 124.5'



LITHOLOGIC DESCRIPTION

Dark brown to orange brown, silty clay; sandy and clayey silt; sandy, much silt and clay, some coarse, quartz sand, sand increases at 10', slightly moist. (ML)

Yellow brown granite saprolite. Some granite gravel. Loose. Saturated. Becoming coarser grained with depth. Some clay.

Highly weathered brown to brown green, hornblende granite with many weathered zones. Some weathered zones drill hard, some drill soft. Much sand in seams.

Dark green to brown, hornblende granite. Much hornblende and weathered quartz. Much silt and sand in seams. Some biotite and pyrite.

Drilling Began: 1/29/85
Drilling Completed: 1/30/85
Well Construction Completed: 1/30/85
Development Completed: 1/30/85
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Deep Rock/Granite
NJ DEP Permit No. 2525633

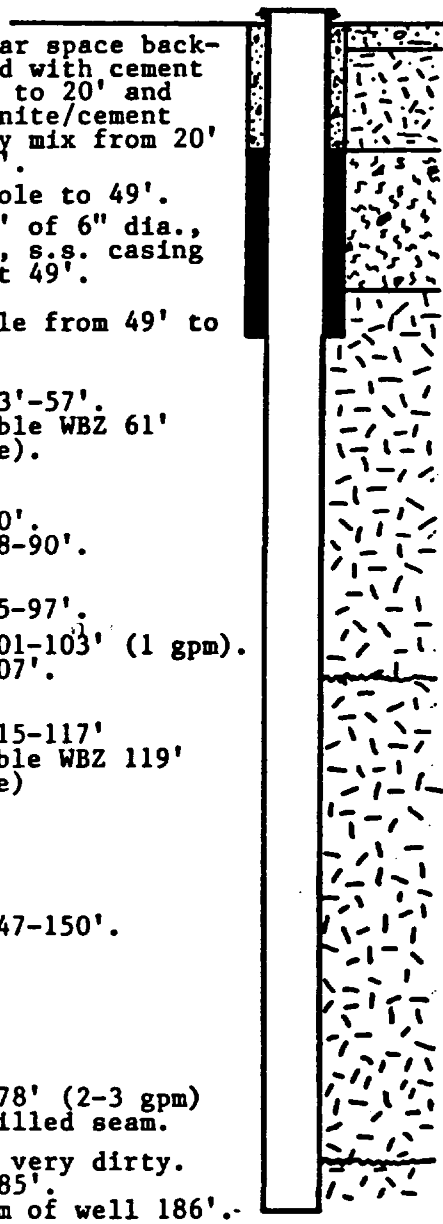
Total Depth: 124.5'
Depth to Bedrock: 50'
Depth to Competent Bedrock: 70'
Elevation T.O.C.: 794.47'
Elevation G.S.: 793.60;
SWL(DATE): 788.22 (2/19/85)
Yield: 7-8 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-3

DEPTH	HNU	EXP	RAD
0	0B	0%B	.03B
0	0.4	0%	N
20	0.2	0%	N
0	0.2	0%	N
40	0.4	0%	N
.0	NR	NR	NR
0	0.2	0%	NR
70	0.2	0%	N
0	NR	NR	NR
90	0.4	0%	NR
	NR	NR	NR
0	NR	NR	NR
120	NR	NR	NR
0	0	0%	.04
140	NR	NR	NR
0	0.2	NR	NR
0	NR	NR	NR
1/0	NR	NR	NR
0	NR	NR	NR
186	0.2	0%	.03

COMMENTS

Annular space back-filled with cement grout to 20' and bentonite/cement slurry mix from 20' to 49'.
10" hole to 49'.
50.97' of 6" dia., SCH10, s.s. casing set at 49'.
6" hole from 49' to 186'.
WZN 53'-57'.
Possible WBZ 61' (trace).
WZN 80'.
WZN 88-90'.
WZN 95-97'.
WBZ 101-103' (1 gpm).
WZN 107'.
WZN 115-117'
Possible WBZ 119' (trace)
WZN 147-150'.
WBZ 178' (2-3 gpm)
Mud filled seam.
Water very dirty.
WZN 185'.
Bottom of well 186'.



LITHOLOIC DESCRIPTION

Orange brown, clayey, silty sand. Trace clay, some silt, much sand. (SW)

Buff to dirty white granite, highly weathered with much sand in seams, dry, hard.

Dark brown, silty, sand. Much mica, very soft, dry, saprolitic.

Primarily dark green hornblende granite with some interbedded gray to buff biotite granite (possible quartz diorite). Much silt and sand seams, trace pyrite, drills alternatively hard and soft.

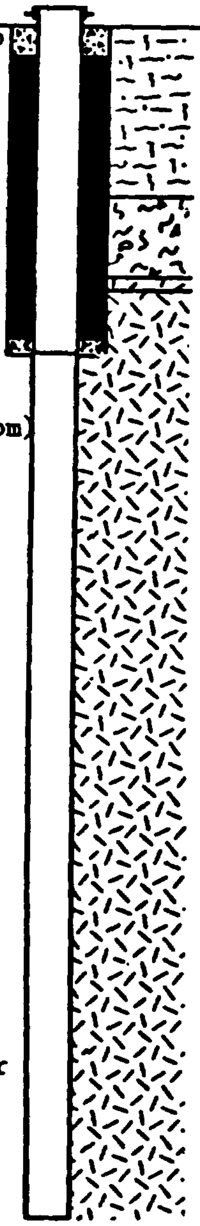
Drilling Began: 1/10/85
Drilling Completed: 1/11/85
Well Construction Completed: 1/11/85
Development Completed: 1/11/85
Driller: William Stothoff Co.
Geologist: JST
Type/Aquifer: Deep rock/granite
DEP Permit No. 2525634

Total Depth: 186'
Depth to Bedrock: Unknown
Depth to Competent Bedrock: 42'
Elevation T.O.C.: 826.09'
Elevation G.S.: 824.22'
SWL(DATE): 1/29/85 779.13'
Yield: 3-4 gpm

302314

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-4

DEPTH	HNU	EXP	RAD	COMMENTS
0	NR	NR	NR	Cement grout seal to 3'.
10	0.6	0%	NR	Annular space back-filled with bentonite slurry which had cement added to the lower 3 to 4'.
20	1.4	0%	NR	10" hole to 35'. 37' of 6" dia., SCH10, s.s. casing set at 35'.
30	2.2	1%	NR	6" hole from 35' to 125'.
40	NR	NR	NR	WZN 37' Much water (15-20 gpm) in overburden.
50	0.4	0%	.02	WZN57'.
60	0	0%	N	WBZ 61' (4 gpm) Mudfilled WZN 68'.
70	0.2	0%	N	WZN 78'.
80	0.2	0%	N	WZN 86'.
90	0.4	0%	N	WBZ 95.5-98' (trace)
100	0.3	0%	N	
110	0	0%	N	Possible slight odor to water.
120	NR	NR	NR	
125	0	NR	NR	Bottom of well 125'



LITHOLOGIC DESCRIPTION

Dark brown sandy silty, clay; gravelly, and sandy clayey silt; gravelly. Trace fine to coarse quartz sand. Some granite cobbles, cohesive, wet at 10'. (ML and CL)

Green brown to brown, granite saprolite with much sand, loose wet.

Alternating gray or white, biotite granite (possible quartz diorite) and dark green, hornblende granite (Possibly some amphibolite or pyroxenite). Biotite zones yield reddish water, much pyrite is zones, some silt and sand seams.

Drilling Began: 1/14/85
Drilling Completed: 1/18/85
Well Construction Completed: 1/18/85
Development Completed: 1/18/85
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Deep rock/granite
NJ DEP Permit No. 2525635

Total Depth: 125'
Depth to Bedrock: 26.5'
Depth to competent Bedrock: 28'
Elevation T.O.C.: 803.69'
Elevation G.S.: 802.13'
SWL(DATE): 795.69' (1/29/85)
Yield: 4 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-5

DEPTH	HNU	EXP	RAD	COMMENTS
0	2.0B	0%B	.02B	Cement grout seal to 3'.
10	0.2	15%	N	Annular space back-filled with bentonite slurry (3' to 90').
20	0.4	0%	.04	
30	0.2	0%	N	10" hole (0-90'). Garbage odor from hole.
40	0.6	5%	N	
50	1.4	0%	N	
60	NR	NR	N	
70	2.4	5%	N	
80	0.8B 1.4	5%B 30%	.03B N	92.12' of 6" dia., SCH10, s.s. casing set at 90'.
90	0.4	5%	N	6" hole (90-165') WZN 93-95' WZN 97.5'.
100	NR	5%	N	Possible WBZ 102' (TR.)
110	NR	NR	N	WZN 106.5 WZN 113-115'.
120	0.2	0%	N	WZN 127'.
130	NR	NR	N	WZN 133-134'. WBZ 135' (4 gpm)
140	0	0%	N	WBZ 140-145' (1 gpm)
150	NR	NR	N	
160	NR	NR	N	
165	0	0%	N	Bottom of well 165'

LITHOLOGIC DESCRIPTION

Med. brown clayey sandy silt and silty sand. Garbage for 3 to 5'. Much silt and sand, some clay, fill (SM)

Light orange brown to brown clayey silty sand; gravelly and sandy silt; gravelly. Gravel increases with depth. Cohesive zones (SM)

Yellow brown to orange brown, granite saprolite with much silt and sand, soft but with hard zones. Much angular weathered quartz and granite. much mica.

Weathered brown to white granite soft with much sand in seams.

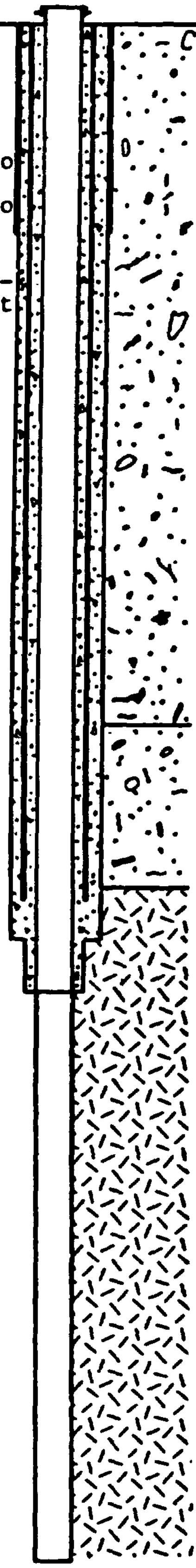
Dark green, hornblende granite. Much hornblende. Trace pyrite. Trace biotite. In some spots becoming a pyroxenite or amphibolite. At 106' the above becomes interbedded with a grayish white biotite granite or gneiss. Much pyrite associated with the hornblende granite. Some weathered zones. Biotite present throughout but also occurs in zones.

Drilling Began: 11/21/84
Drilling Completed: 11/28/84
Well Construction Completed: 11/28/84
Development Completed: 11/28/84
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Deep rock/granite
NJ DEP Permit No. 2525636

Total Depth: 165'
Depth to Bedrock: 80'
Depth to Competent Bedrock: 85'
Elevation T.O.C.: 843.50'
Elevation G.S.: 841.89'
SWL(DATE): 807.42' (1/29/85)
Yield: 5.0 gpm

302316

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-6



DEPTH	HNU	EXP	RAD	COMMENT	LITHOLOGIC DESCRIPTION
0	1.0B	NR	.02B	10" steel casing to 24'.	Granite cobbles to 1'.
10	NR	NR	NR	8" steel casing to 100'. 10" hole to 104'. 8" hole from 104' to 110'. 6" hole from 110' to 175'.	
20	2.0 10.0 C	15% 100% C	N		
30	NR	NR	NR	Annular spaces back-filled with a cement grout 0' to 110'.	
40	2.0 10.0 C	15% 100% C	N	Very strong "methane" odors throughout fill.	Green gray to gray green, fill and garbage. Garbage consists of much decayed wood, glass, paper, plastics, metal, wire, and cloth-like material. Many voids. Dry to 50'. Soft.
50	1.0B	0%B	NR		
60	NR	NR	NR		
70	NR	NR	NR		
80	NR	NR	NR		80' light brown silt or clay. Possib clay liner. Harder than fill above, low return.
90	4.0	10%	NR		
100	4.0	10%	NR	112.33' of 6" dia., SCH10, s.s. casing set at 110'.	
110	1.0B	0%B	NR	WZN 102'. WZN 109'. WZN 114'.	
120	NR	NR	NR	WBZ 117-120' (1 1/4 gpm). Odor to water.	
130	2.3	2%	NR		Dark green, hornblende granite. In some spots it may be amphibolite or pyroxenite. Large amounts of biotite occur occasionally. Some muscovite. Trace pyrite. Very hard.
140	2.5	10%	NR		
150	2.0	10%	NR	WZN 155'. WZN 159'.	
160	NR	NR	NR	WBZ 160-163' (3-4 gpm).	
170	3.2	12%	NR		
175	3.2	12%	.02		

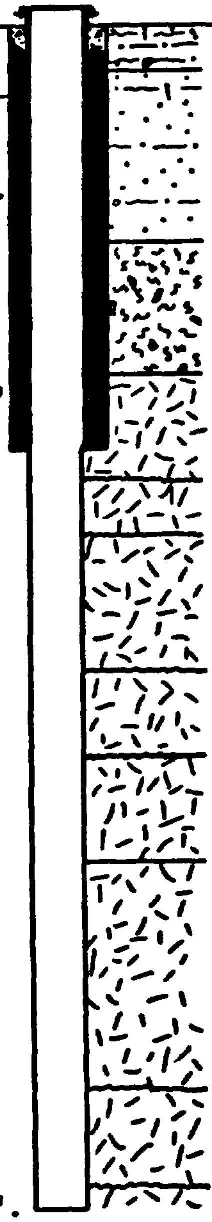
WELL D-6
(cont'd)

Drilling Began: 1/23/85
Drilling Completed: 1/28/85
Well Construction Completed: 1/29/85
Development Completed: 1/28/85
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Deep rock/granite
NJ DEP Permit No. 2525637

Total Depth: 175'
Depth to Bedrock: 98.5'
Depth to Competent Bedrock: 98.5'
Elevation T.O.C.: 872.32'
Elevation G.S.: 870.09'
SWL(DATE): 809.74' (1/29/85)
Yield: 4-5 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-7

DEPTH	HNU	EXP	RAD	COMMENTS
0	0.5B	0%B	.03B	Cement grout seal to 3'.
10	0	0%	N	Annular space back-filled with bento-nite slurry. (3' to 45') 10" hole 0' to 45'.
20	0.7	2%	N	Much water in overburden.
30	0.4	NR	N	47.3' of 6" dia., SCH10, s.s. casing set at 45'.
40	NR	NR	NR	6" hole 45' to 125'
50	2.0	3%	NR	WBZ 47.5-48'. (20 gpm). Strong odor to water. WBZ 54' (2 gpm).
60	NR	NR	NR	WZN 60.5'. WZN 65'.
70	5.6	5%	.02	WBZ 68.5 (1 gpm). WZN 74'.
80	2.2	2%	N	WBZ 77' (2 gpm). Water very foamy.
90	2.2	2%	NR	WZN 98'
100	5.8	4%	NR	
110	2.0	NR	NR	WBZ 112.5' (2 gpm)
120	0.8	2%	NR	WBZ 122' (3 gpm) Water very foamy.
125	1.6	3%	.03	Bottom of well 125'.



LITHOLOIC DESCRIPTION

Light to medium brown, sandy, gravelly silt. Moist. (ML)

Light to medium brown, clayey silty sand; gravelly, trace clay, trace gravel, some silt, much sand. Wet. (SM)

Green gray highly weathered granite saprolite with much sand. Much granite gravel, cobble and boulder sized, wet, soft zones.

Green gray hornblende granite with brown weathered zones. Pyrite present as crystals and stringers. Trace biotite. Hardness increases with depth.

77' buff to light gray biotite granite. Appears gneissic. Hard. Some biotite in layers.

38' pale to dark green biotite, hornblende granite. Some pyroxenes or amphiboles. Biotite increases with depth.

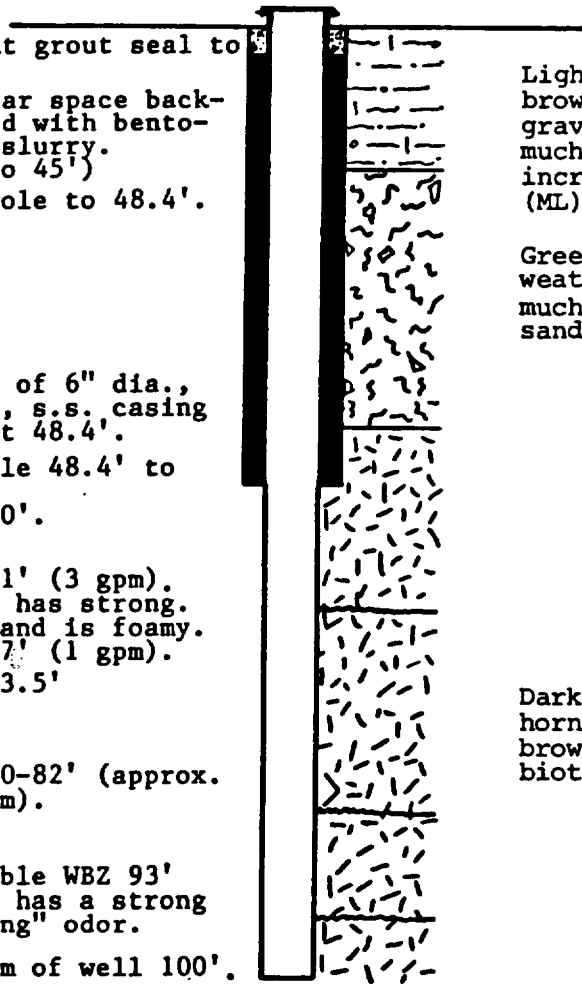
Drilling Began: 12/11/84
Drilling Completed: 12/17/84
Well Construction Completed: 12/17/84
DEvelopment Completed: 12/17/84
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Deep rock/granite
NJ DEP Permit No. 2525638

Total Depth: 125'
Depth to Bedrock: 37'
Depth to Competent Bedrock: 37'
Elevation T.O.C: 792.65'
Elevation G.S.: 790.98'
SWL(DATE): 786.88' (1/29/85)
Yield: 30 gpm

302319

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-8

DEPTH	HNU	EXP	RAD	COMMENTS
0	NR	3%B	.04B	Cement grout seal to 3'.
0	NR	2%	N	Annular space back-filled with bentonite slurry. (3' to 45')
0	NR	5% 14%	N	10" hole to 48.4'.
30	NR	4% 7%	N	
40	NR	3%	N	50.71 of 6" dia., SCH10, s.s. casing set at 48.4'.
50	0.2	NR	NR	6" hole 48.4' to 100'. WZN 50'.
60	NR	NR	NR	WBZ 61' (3 gpm). Water has strong. odor and is foamy. WBZ 67' (1 gpm).
	0.9	0%	NR	WZN 73.5'
0	NR	NR	NR	WBZ 80-82' (approx. 15 gpm).
0	4.7	3%	NR	Possible WBZ 93' Water has a strong "biting" odor.
0	5.3 6.3	2%	NR	Bottom of well 100'.



LITHOLOGIC DESCRIPTION

Light to medium brown or green brown, clayey sandy silt; gravelly, some clay and gravel; much sand and silt, clay increases at 5', wet at 10'. (ML)

Green to green brown highly weathered granite saprolite with much medium to coarse quartz sand. Very soft, wet.

Dark green to blackish green, hornblende granite. Much soft, brown weathered zones, trace biotite and pyrite.

Drilling Began: 11/29/84
Drilling Completed: 11/30/84
Well Construction Completed: 11/30/84
Development Completed: 11/30/84
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Deep rock/granite
NJ DEP Permit No. 2525639

Total Depth: 100'
Depth to Bedrock: 40'
Depth to competent Bedrock: 42'
Elevation T.O.C.: 810.16'
Elevation G.S.: 808.16'
SWL(DATE): 798.47' (1/29/85)
Yield: 20-25 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL D-9

DEPTH		HNU	EXP	RAD
0	—	3.0B	2%B	.02B
10	—	1.0	10%	.02
20	—	1.6	4%	.03
30	—	NR	NR	NR
40	—	2.2	3%	.02
50	—	3.6	1%	.02
60	—	1.6	1%	NR
70	—	4.0	2%	NR
80	—	1.2	2%	.02
90	—	1.4	0%	NR
100	—	NR	NR	NR
110	—	NR	NR	NR
120	—	NR	NR	NR
125	—	NR	NR	NR

COMMENTS

Cement grout seal to 2'.

Annular space back-filled with bentonite slurry (2' - 81').

10" hole 0 to 81'.

~5 gpm water in overburden.

83.5' of 6" dia., SCH 10, SS casing set at 81'.

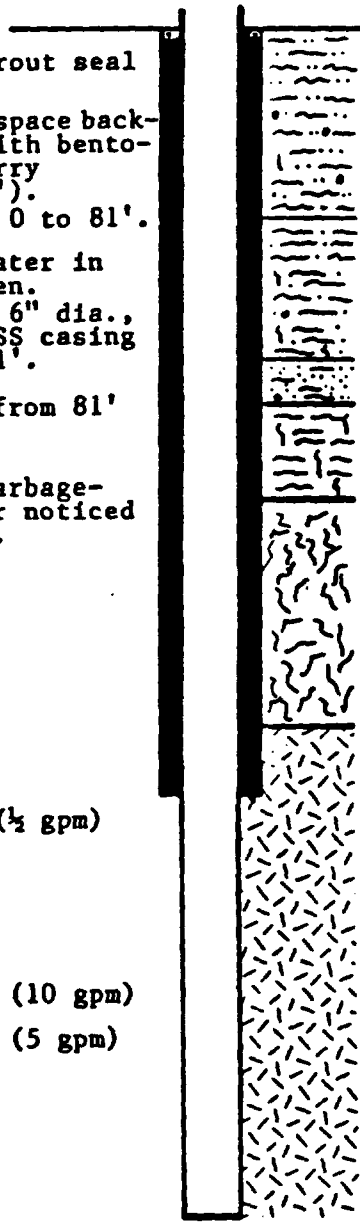
6" hole from 81' to 125'.

Strong garbage-type odor noticed near 35'.

WBZ 83' (½ gpm)

WBZ 102' (10 gpm)

WBZ 107' (5 gpm)



LITHOLOGIC DESCRIPTION

Orange-brown, clayey, gravelly, sandy silt. Some weathered granite gravel, cobble and sand boulder sized, trace clay, some sand increase with depth. (ML)

As above but increased silt and fine sand content.

Brown-green to green-brown highly weathered granite saprolite. Much quartz.

Yellow brown clayey sandy silt, trace clay, some sand, much silt, saprolitic.

Green-brown highly weathered granite saprolite and highly weathered granite bedrock. Some saprolite, much weathere_ granite, very hard in zones.

Brown-green, gray and green-gray granit very hard. Much hornblende.

Vertical Scale
1" = 20'

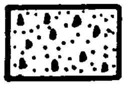
Drilling Began: 12/19/84
Drilling Completed: 12/26/84
Well Construction Completed: 12/26/84
Development Completed: 12/26/84
Driller: William Stothoff Co.
Geologist: JST/RCW
Well Type/Aquifer: Deep rock/granite
NJ DEP Permit No. 2525640

Total Depth: 125'
Depth to Bedrock: 50'
Depth to Competent Bedrock: 75'
Elevation T.O.C.: 809.24
Elevation G.S.: 807.24'
SWL (Date): 783.03' (1/29/85)
Yield: 16 gpm

APPENDIX F-2

GEOLOGIC WELLS LOGS FOR SHALLOW MONITORING WELLS

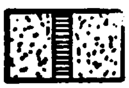
<u>Well Construction Symbols for Shallow Wells</u>

 Portland Cement Grout

 Bentonite Slurry with stainless steel solid

 Peltonite Seal

 Caved Formation

 Sand Pack with stainless steel screen

302323

B: Indicates a Background Measurement

EXP: Explosimeter Readings (values in percent explosive/readings taken at top of casing.

G.S.: Ground Surface

HNU: Measurements made for organic vapor content using an HNU vapor analyzer (values in parts per million/readings taken at top of casing).

N: Readings not above background level reading (many times this value equals Ø).

NR/NT: No measurements made due to either; lack of time, instrument malfunction, or inavailability of instrument.

RAD: Radiation measurements made using a Radiation Alert detector (values in mili-roentgens per hour/readings taken on soil and rock samples).

SCH1Ø: Schedule 1Ø Casing

S.S.: Stainless Steel

T & C: Threaded and Coupled Casing

T.O.C.: Top of Casing

WBZ: Water Bearing Zone

WZN: Weathered Rock Zone

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL S-1

Depth	HNU	EXP	RAD
0	1.0B	0%B	NT
	2.6	2%	NT
10	3.5	3%	NT
	2.6	5%	NT
20	4.0	5%	NT
25	2.2	2%	NT

COMMENTS

6" Steel protector casing installed to 3'.

Cement grout seal to 3'.

Annular space backfilled with bentonite slurry (3'-8')

4" dia., SCH10, solid s.s. casing to 14'.

Peltonite seal 8' to 11'.

Top of 4" dia., 20 slot, S.S. screen 14'.

Sand pack 11'-25'

Bottom of 4" dia., 20 slot, S.S. screen 24'

LITHOLOGIC DESCRIPTION

Green brown to yellow brown, sandy silt; some gravel and cobbles; trace clay. Garbage encountered at 2'. Saturated at 4' to 5'. (ML)

Clay content increases.

Green brown to brown green, granite sapprolite. Very sandy. Some gravel. Highly weathered. Soft. Much water at 20'. Water is foamy.

Dark green, granite bedrock.

Drilling Began: 12/18/84
Drilling Completed: 12/18/84
Well Construction Completed: 12/19/84
Development Completed:
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Shallow Mon./Saprolite
NJ DEP Application No. 2525627

Total Depth: 25'
Screened Interval: 14' to 24'
Depth to Bedrock: 23.5'
Elevation T.O.C.: 793.67;
Elevation G.S.: 791.27'
SWL(DATE): 787.96 (1/29/85)
Yield: 10-20 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL S-2

Depth	HNU	EXP	RAD
0	1.0B	2%B	.02B
10	0	0%	N
20	0.8	0%	N
30	0.4	0%	N
40	0.2	0%	N
50	0.2	0%	N
58	NR	0%	NR

COMMENTS

6" steel protector casing installed to 3'.

Cement grout seal to 3'.

Annular space back-filled with bento-nite slurry. (3' to 35').

4" dia., SCH10, solid s.s. casing to 40'.

10" dia., T&C, steel casing to approx. 44'.

Peltonite seal from 35' to 38'.

Sand pack from 38' to 52'.

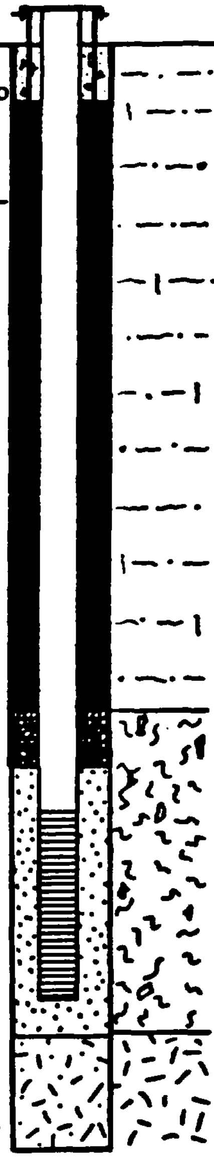
Top of 4" dia., 20 slot, s.s. screen to 41'.

Some water here.

Bottom of 4" dia., 20 slot, s.s. screen-51'.

Caved formation.

Bottom of hole 58'.



LITHOLOGIC DESCRIPTION

Light brown to orange brown, sandy, clayey silt; some gravel, gravel is granite, sand is mostly quartz. (ML)

Saturated around 17'.

Brown to green brown, granite saprolite. Very sandy with many weathered granite fragments. Very soft. Some pyrite.

Buff to green, highly weathered and broken, hornblende granite.

Drilling Began: 1/2/85
Drilling Completed: 1/2/85
Well Construction Completed: 4/3/85
Development Completed: 1/3/85
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Shallow Mon./Saprolite
NJ DEP Permit No. 2525628

Total Depth: 58'
Screened Interval: 41' to 51'
Depth to Bedrock: Approx. 52'
Elevation T.O.C.: 817.92'
Elevation G.S.: 816.06'
SWL(DATE): 798.79' (1/29/85)
Yield: 3-4 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL S-3

DEPTH	HNU	EXP	RAD
0	NR	NR	NR
10	-1.0	0%	NR
20	-1.2	NR	NR
0	-1.6	0%	NR
0	NR	NR	NR
9.5	NR	NR	NR

COMMENTS

6" steel protector casing installed to 3'.

Cement grout seal to 3'.

Annular space back-filled with bentonite slurry. (3' to 34').

4" dia., SCH10, solid s.s. casing to 37.5'.

Approx. 5 gpm of water in overburden, fairly strong odor.

Peltonite seal from 34' to 35'.

Sand pack from 35' to 49.5'.

Top of 4", 20 slot, s.s. screen 37.5'.

Bottom of 4', 20 slot, s.s. screen 47.5'.

LITHOLOGIC DESCRIPTION

Medium to light orange brown, gravelly, silty sand. (SP)

Light orange brown, sandy, clayey silt. (ML)

Brown green, sandy silt. (SM)

Green brown, granite saprolite with much sand and some silt. Very soft.

Green to brown green, hornblende granite. Much quartz.

Drilling Began: 12/26/84
Drilling Completed: 12/27/84
Well Construction Completed: 12/28/84
Development Completed:
Driller: William Stothoff Co.
Geologist: RCW
Well Type/Aquifer: Shallow Mon./Saprolite
NJ DEP Permit No. 2525629

Total Depth: 49.5'
Screened Interval: 37.5' to 47.5'
Depth to Bedrock: 46'
Elevation T.O.C.: 809.93'
Elevation G.S.: 807.93'
SWL(DATE): 785.35' (1/29/85)
Yield: est 5 gpm (open hole)

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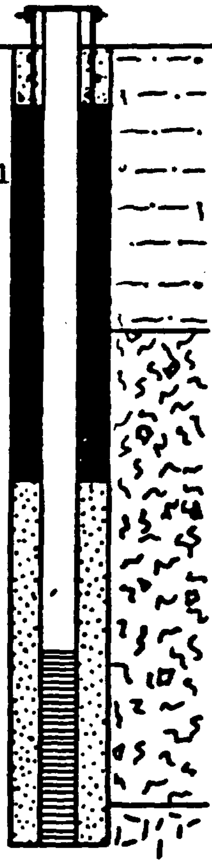
COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL S-4

DEPTH	HNU	EXP	RAD	COMMENTS	LITHOLOGIC DESCRIPTION
0	2.0B	0%B	.03B	6" steel protector casing installed to 3'.	Brown to yellow brown, clayey sandy silt; gravelly, some weathered granite gravel, sand fine to coarse. Trace garbage near 2'. (ML)
	0.8	5%	N	Cement grout seal to 3'.	
10	1.0	4%	.01	Annular space backfilled with bentonite slurry (3' to 18').	
	1.0	4%	.01	Peltonite seal 18' to 23'.	
20	1.4	4%	N	Sand pack 23' to 42'.	
	2.6	5%	N	4" dia., solid, s.s. casing to 32'.	Dark green to green brown, highly weathered granite saprolite, with much sand, soft.
30	3.1	5%	N		
	1.8	3%	N	Top of 4" dia., 20 slot s.s. screen - 32'. Some water here with a very strong odor.	
40	2.2	4%	N		
42	NT	NT	NT	Bottom of 4" dia., 20 slot, s.s. screen - 42'.	Brown green, hornblende granite.



Drilling Began: 12/4/84
Drilling Completed: 12/4/84
Well Construction Completed: 12/5/84
Development Completed:
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Shallow Mon./Saprolite
NJ DEP Permit No. 2525630

Total Depth: 42.0'
Screened Interval: 32' to 42'
Depth to Bedrock: 42'
Elevation T.O.C.: 810.33'
Elevation G.S.: 808.13'
SWL(Date): 798.00 (1/29/85)
Yield: 2 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL S-5

DEPTH	HNU	EXP	RAD
0	-1.0B	0%B	.03B
	0.2	0%	N
10	-0.2	0%	N
	0.4	0%	N
20	-0.2	0%	N
	0.5	1%	N
29	-0.8	0%	N

COMMENTS

6" steel protector casing installed to 3'.

Cement grout seal to 3'.

Annular space backfilled with bentonite slurry (3'-15').

Peltonite seal from 15' to 17'.

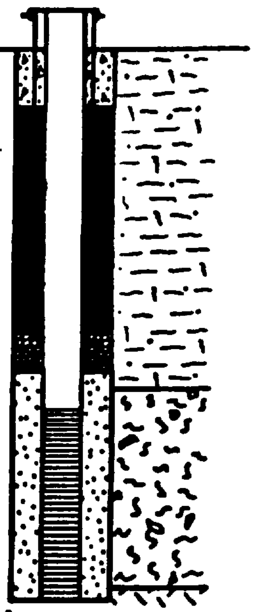
Sand pack from 17' to 29'.

Top of 4" dia., 20 slot, s.s. screen - 19'.

Much water around 26'.

Bottom of 4" dia., 20 slot, s.s. screen to 29'.

Bottom of hole 29'.



LITHOLOGIC DESCRIPTION

Orange brown, sandy clayey silt; gravelly, trace of granite gravel, sand occurs in lenses, cohesive slightly moist to moist. Wet at 10'. (ML)

Yellow brown to green brown, highly weathered granite saprolite with much sand. Soft.

Green, hornblende granite.

Drilling Began: 1/22/85
Drilling Completed: 1/22/85
Well Construction Completed: 1/22/85
Development Completed: 1/23/85
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Shallow Mon./Saprolite
NJ DEP Permit No. 2525631

Total Depth: 29'
Screened Interval: 19' to 29'
Depth to Bedrock: 29'
Elevation T.O.C.: 804.77'
Elevation G.S.: 801.98'
SWL(DATE): 796.50' (1/29/85)
Yield: 10-20 gpm

COMBE FILL SOUTH LANDFILL
PROJECT NO. 8455
MONITORING WELL S-6

DEPTH	HNU	EXP	RAD
0	NR	NR	NR
10	1.0	0%	.02
20	1.0	0%	N
30	1.2	0%	N
40	1.2	0%	N
50	0.8	0%	N
60	NR	NR	NR
69	NR	NR	NR

COMMENTS

6" steel protector casing installed to 3'.

Annular space back-filled with bentonite slurry (3' to 42').

4" dia., SCH10, solid s.s. casing to 54'.

Peltonite seal from 42' to 45'.

Sand pack from 45' to 65'.

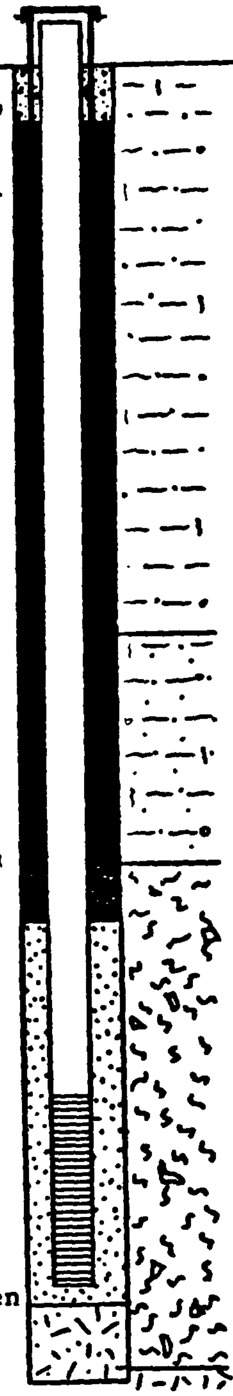
Approx. 1.3 gpm water

Top of 4" dia., 20 slot, s.s. screen- 54'

Bottom of 4" dia., 20 slot, s.s. screen to 64'.

Caved form. 64' to 69'.

Bottom of hole 69'.



LITHOLOGIC DESCRIPTION

Dark brown to orange brown, sandy clayey silt; gravelly. Some sand in lenses, some granite cobbles, dry to slightly moist. (ML)

Orange brown to yellow brown clayey, sandy silt. Sand is fine to medium. (ML)

Yellow brown to green brown, highly weathered, granite saprolite with much coarse grained sand. Soft.

Green to green brown granite bedrock.

Drilling Began: 1/8/85
Drilling Completed: 1/8/85
Well Construction Completed: 1/9/85
Development Completed: 1/9/85
Driller: William Stothoff Co.
Geologist: JST
Well Type/Aquifer: Shallow Mon./Saprolite
NJ DEP Permit No. 2525641

Total Depth: 69'
Screened Interval: 54' to 64'
Depth to Bedrock: 68.5'
Elevation T.O.C.: 840.09'
Elevation G.S.: 837.37'
SWL(DATE): 813.19' (1/29/85)
Yield: 2-4 gpm

r.e. wright associates, inc.

302330

APPENDIX G

TEST PIT CONSTRUCTION PROCEDURES AND LOGS

Excavation Procedures - Backhoe Test Pits

A John Deere Model 510 backhoe with a 12- to 13-foot reach capability and a specially fitted safety shield for the operator was used to advance each of the three test pit excavations shown on Figure 1.3-2. Completed test-pit depths ranged from 11 to 12 feet. Continuous air monitoring using an HNU photoionization detector and an MSA Explosimeter was conducted during the excavation. Both the air in the vicinity of the opened test pit and excavated material removed by the backhoe was monitored. Excavated material was piled on large plastic sheets placed near each pit. Since no apparently hazardous material was uncovered (determined by air monitoring and visual examination), the need to separate contaminated material from uncontaminated material as set forth in the FSP was not warranted.

Since, for safety reasons no one was allowed to enter a test pit, all soil and/or fill descriptions were made from material retrieved in the backhoe bucket. All descriptions and observations were made by a REWAI geologist and are included on soil classification logs which follow this procedural text.

In addition to soil descriptions for each test pit, there was also at least one soil sample collected from each test pit for laboratory analysis. Two samples were collected from Test Pit 1 (TP-1), consisting of a 0 to 9 foot depth composite, and a 9 to 11.3 feet interval composite. A 0 to 12 feet composite, was collected from each of Test Pit 2 (TP-2) and 3 (TP-3).

Samples were taken from the backhoe bucket, however, the material sampled was not in direct contact with the bucket. The sample was removed from the bucket using a laboratory cleaned, stainless steel spoon for VOA samples and a clean gloved hand for metals samples. The remaining procedures followed during the sampling are outlined in Section 3.6.2 of the Field Sampling Plan.

Decontamination of the backhoe between sites consisted of a thorough steam cleaning.

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project Combe Fill South Landfill
Site Area Southeast Corner
Contractor R & R Construction
Classified by JST

Job No. 8455
Date 8/27/85
Sheet 1 of 1

Drill Hole No. TP-1
Elevation
SWL
Core Diameter

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc. HNU Soil	HNU Air	EXP Soil	EXP Air
			Medium to dark brown, cobbly, clayey silt. Becoming siltier and sandier with depth. Very sandy in spots. Many granite cobbles. Poorly sorted. Fill. Dry.			5.0	5.0	1%	1%
.0						5.0	5.0	1%	1%
			Sames as above. Slight odor in soils which becomes stronger with depth.			5.0	4.0	1%	1%
0	S1	NA	Red-brown to brown, gravelly, sandy silt. Trace clay.			5.0	4.0	1%	1%
			Yellow brown, slightly gravelly, silty sand. Sand is fine to very coarse grained. Highly weathered.			5.0	4.5	1%	1%
6.0			Some granite cobbles. Damp. Fill.			5.2	3.5	1%	1%
						5.5	5.0	1%	1%
.0			Same as above.			5.0	5.0	1%	1%
.0						6.0	4.0	2%	1%
0	S2	NA	Dirty yellow-brown, highly weathered "granite" sand. Some red-brown silty seams. Some granite cobbles. Sand is fine to coarse grained. Fill. Strong odor.			8.0	3.5	3%	1%
1						7.5	3.5	4%	1%
			Bottom of Test Pit #1 11.3'						

Sample #1 (0-9' composite)
2 VOA's A30012/A30013
2 Metals A30014/A30015

Samples #2 (9-11.3')
2 VOA's A30016/A30017
2 Metals A30018/A30019

No garbage noticed in pit. No drums noticed. Some isolated damp spots are present.

Readings listed are in ppm or percents above background levels.

Background readings were measured at the command post.
Background HNU = 0 ppm
Background EXP = 0%

302334

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project Combe Fill South Landfill
Site Area Near SB-2
Contractor R & R Construction
Classified by JST

Job No. 8455
Date 8/27/85
Sheet 1 of 1

Drill Hole No. TP-2
Elevation
SWL
Core Diameter

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc. HNU Soil	HNU Air	EXP Soil	EXP Air
			Medium brown, sandy, slightly clayey silt. Trace gravel. Fairly firm and tight. Damp.						
2.0			Garbage and fill. Glass bottles, much plastic, garbage bags, wood, shoes, newspaper, many metal pipes and frames, washing machine, mufflers, springs, wires. All of this trash is surrounded by a granite cobble, sandy silty matrix. Overall color is gray-brown. Material is highly permeable. Strong garbage odor. Water dripping into pit at 5'. Same to 12.0'.			5.0	4.0	1%	1%
4.0						6.0	4.0	1%	1%
6.0	S3	NA				6.0	5.0	1%	1%
8.0						5.0	4.0	1%	0-1%
						5.0	5.0	1%	1%
10.0									
12.0						6.0	5.0	1%	1%
			Bottom of Test Pit #2 12.0'						
			Sample #3 (0-12' composite) 2 VOA's A30006/A30007 2 Metals A30004/A30005			Much garbage in pit. Strong garbage-like odor. No drums or suspicious garbage. Readings listed are in ppm or percents above background levels. Background readings were measured at the command post. Background HNU = 0 ppm Background EXP = 0%			

302335

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project: Combe Fill South Landfill	Job No. 8455	Drill Hole No. TP-3
Site Area: Near E. Trout Brook HW.	Date 8/27/85	Elevation
Contractor: R & R Construction	Sheet 1 of 1	SWL
Classified by: JST		Core Diameter

Depth	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc. HNU Soil	HNU Air	EXP Soil	EXP Air
			Medium brown to orange-brown, silty gravelly sand. Loose. Saturated at 1.5'. Some granite cobbles.			4.0	5.0	1%	1%
						5.0	5.0	1%	1%
			Dark brown, sandy, clayey silt and silty sand. Sand is fine to coarse grained. Poorly sorted. Some garbage present. Fill.			7.0	5.0	2%	1%
			Same to 9.0' with more granite cobbles and garbage present. General type garbage. All fill to 9.0'.			6.0	5.0	2%	1%
						6.0	4.5	2%	1%
6.0	S4	NA				6.2	5.0	3%	2%
						5.0	4.5	1%	1%
						5.0	5.0	1%	1%
			At 9.0' soil looks more natural. Gray-brown, silty sand and sandy silt. Better Sorting. More compact and tight.						
						4.5	5.0	1%	1%
			Bottom of Test Pit #3 12.0'			5.0	4.5	1%	1%

Sample #4 (0-12' composite)
2 VOA's A30008/A30009
2 Metals A30010/A30011

Water seeping into pit from 1.5' on the landfill side. HNU reading on water is 7.0 ppm.
Readings listed are in ppm or percents above background levels.
Background readings were measured at the command post.
Background HNU = 0 ppm
Background EXP = 0%

302336

APPENDIX H

RESULTS OF SIEVE AND HYDROMETER TESTING

ON SELECTED SOIL SAMPLES

Carl-8455

RECEIVED

JM500-6/BST-3412

JUN 25 1985

REWAI

bst borings, soils & testing co.
SUBSURFACE INVESTIGATION ■ GEOTECHNICAL ENGINEERING

June 24, 1985

Wright Associates
3240 Schoolhouse Road
Middletown, Pennsylvania 17057

Attention: Mr. Carl Boyer

Re: Laboratory Testing
Job 8455/Combe Fill S. 3/72
P.O. 8455-595

Gentlemen:

Transmitted herewith are two (2) copies each of the laboratory test results for the above referenced project.

Also enclosed is our invoice for work completed on this project.

It has been a pleasure serving you on this project and we are looking forward to doing more work of a similar nature for you.

Very truly yours,

BORINGS, SOILS & TESTING CO.

Joseph C. Mehalick

Joseph C. Mehalick
President

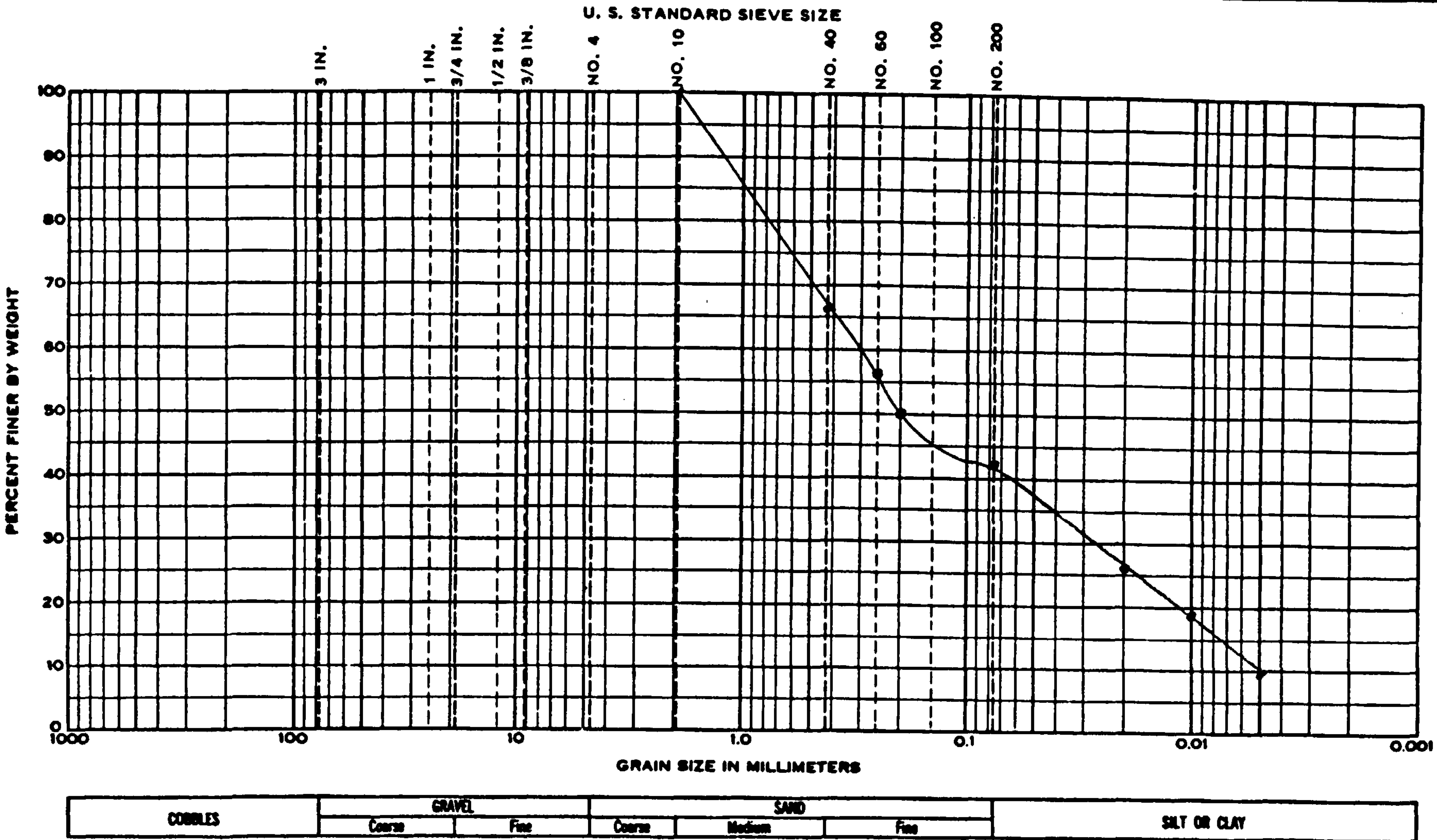
JCM/bad

encls.

302338

H-1

302339



Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI	REMARKS:
SB-2	18'-20'		50.6				Sample #1

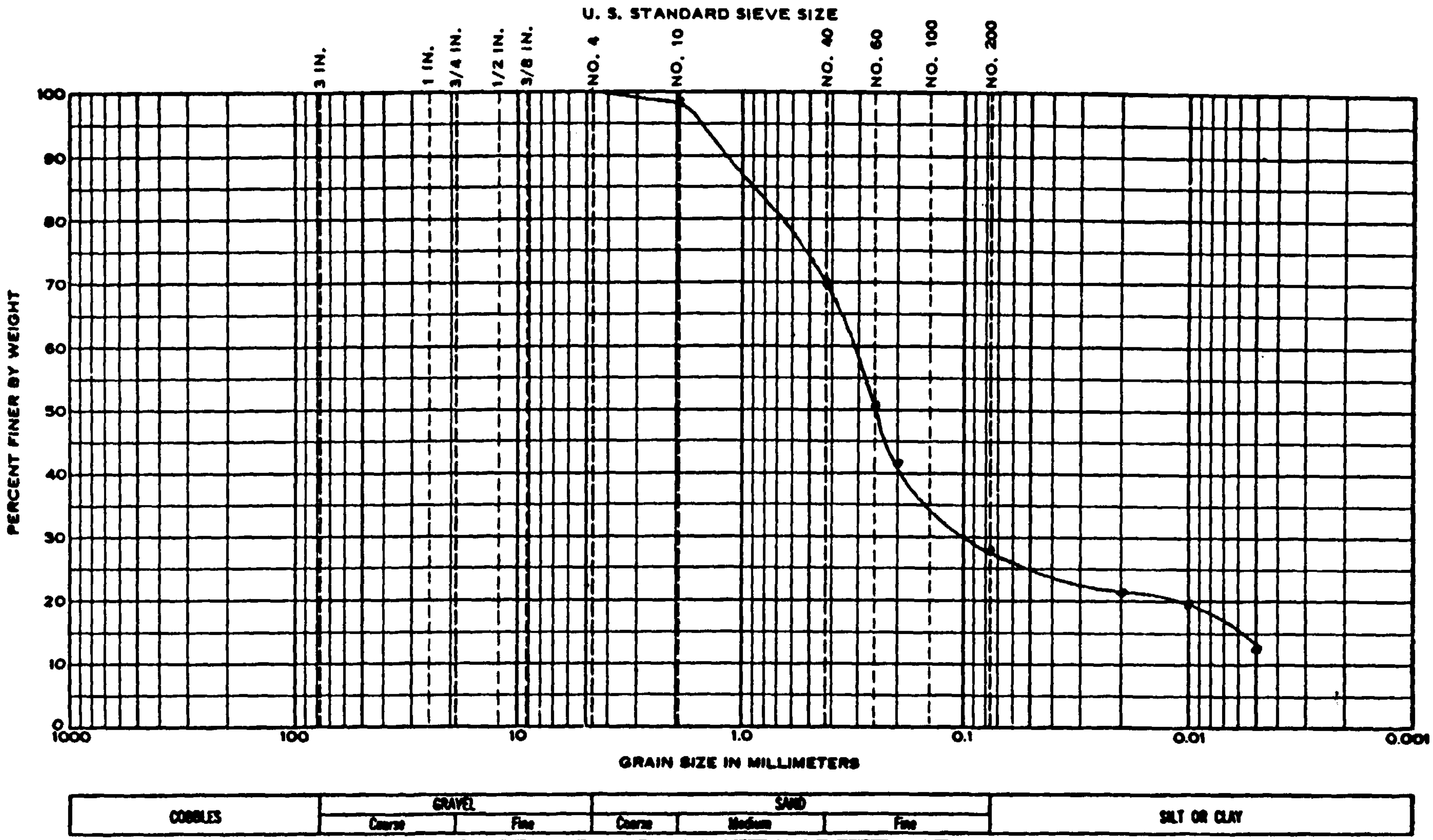
BORINGS, SOILS & TESTING CO.
FOUNDATION ENGINEERS
HARRISBURG, PENNSYLVANIA

Project: JM500-6

Location: Wright Associates

Date 6/24/85 Made By MP Chkd By JJM

GRADATION CURVES



Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI	REMARKS:
SB-2	26'-28'		19.0				Sample #2

BORINGS, SOILS & TESTING CO.
FOUNDATION ENGINEERS
HARRISBURG, PENNSYLVANIA

Project: JM500-6

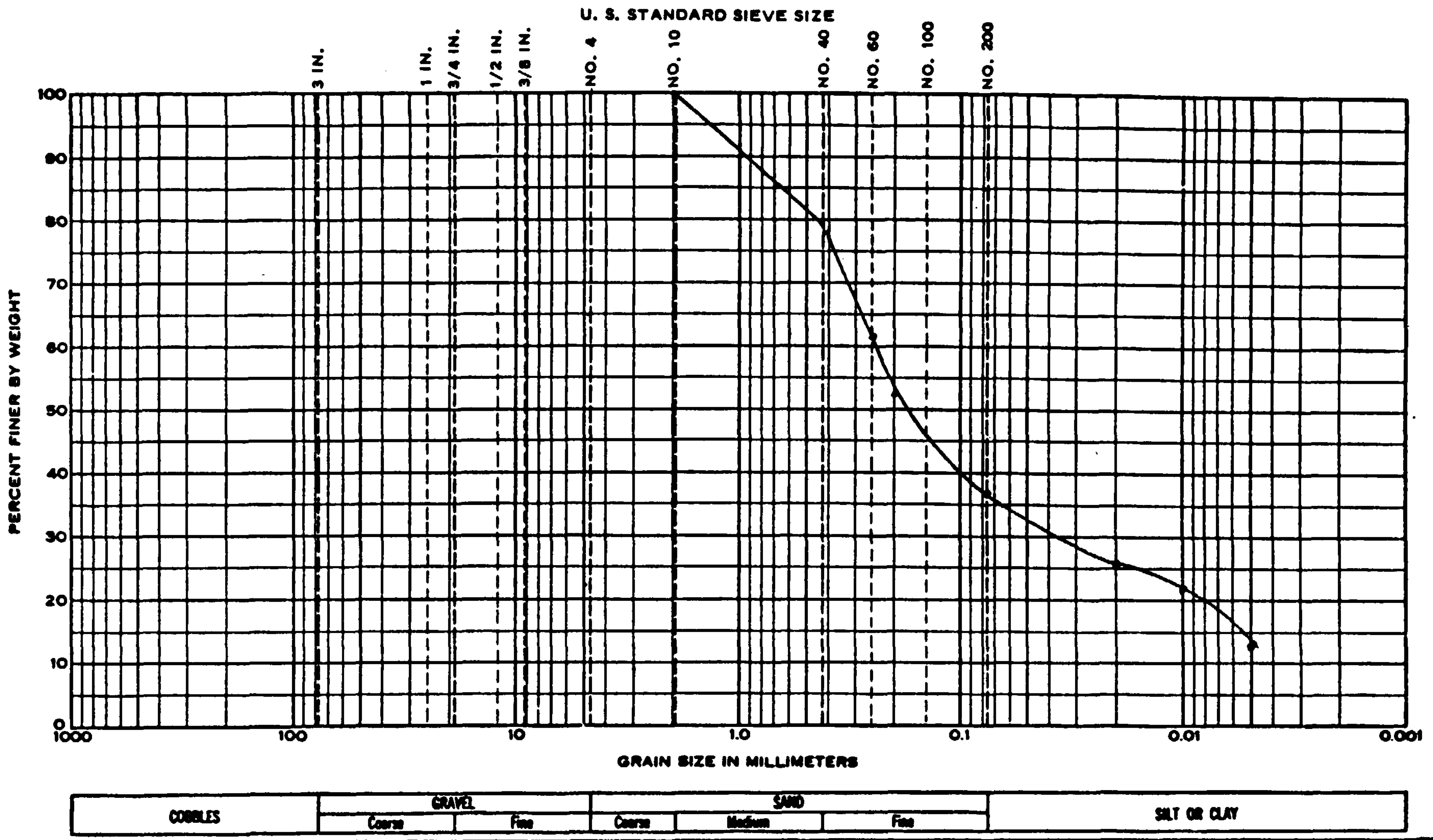
Location: Wright Associates

Date 6/24/85 Made By MP Chkd By JJM

GRADATION CURVES

H-2

302340



Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI	REMARKS:
SB-3	24'-28'		31.6				Sample #3

BORINGS, SOILS & TESTING CO.
FOUNDATION ENGINEERS
HARRISBURG, PENNSYLVANIA

Project: JM500-6

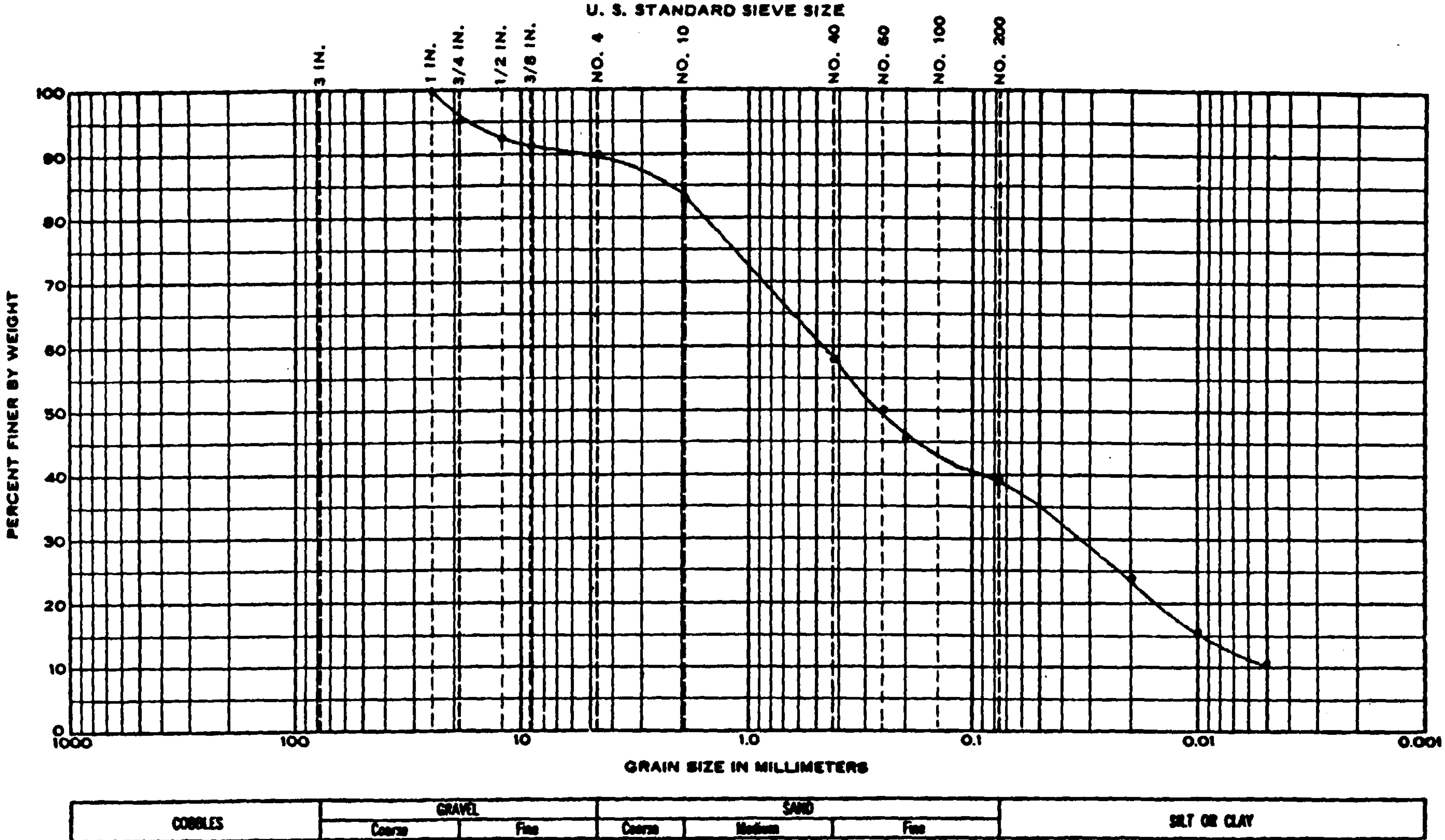
Location: Wright Associates

Date 6/24/85 | Made By MP | Chkd By JJM

GRADATION CURVES

H-3

302341



Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI	REMARKS:
SB-4	6'-8'		13.6				Sample #4

GRADATION CURVES

BORINGS, SOILS & TESTING CO.
FOUNDATION ENGINEERS
HARRISBURG, PENNSYLVANIA

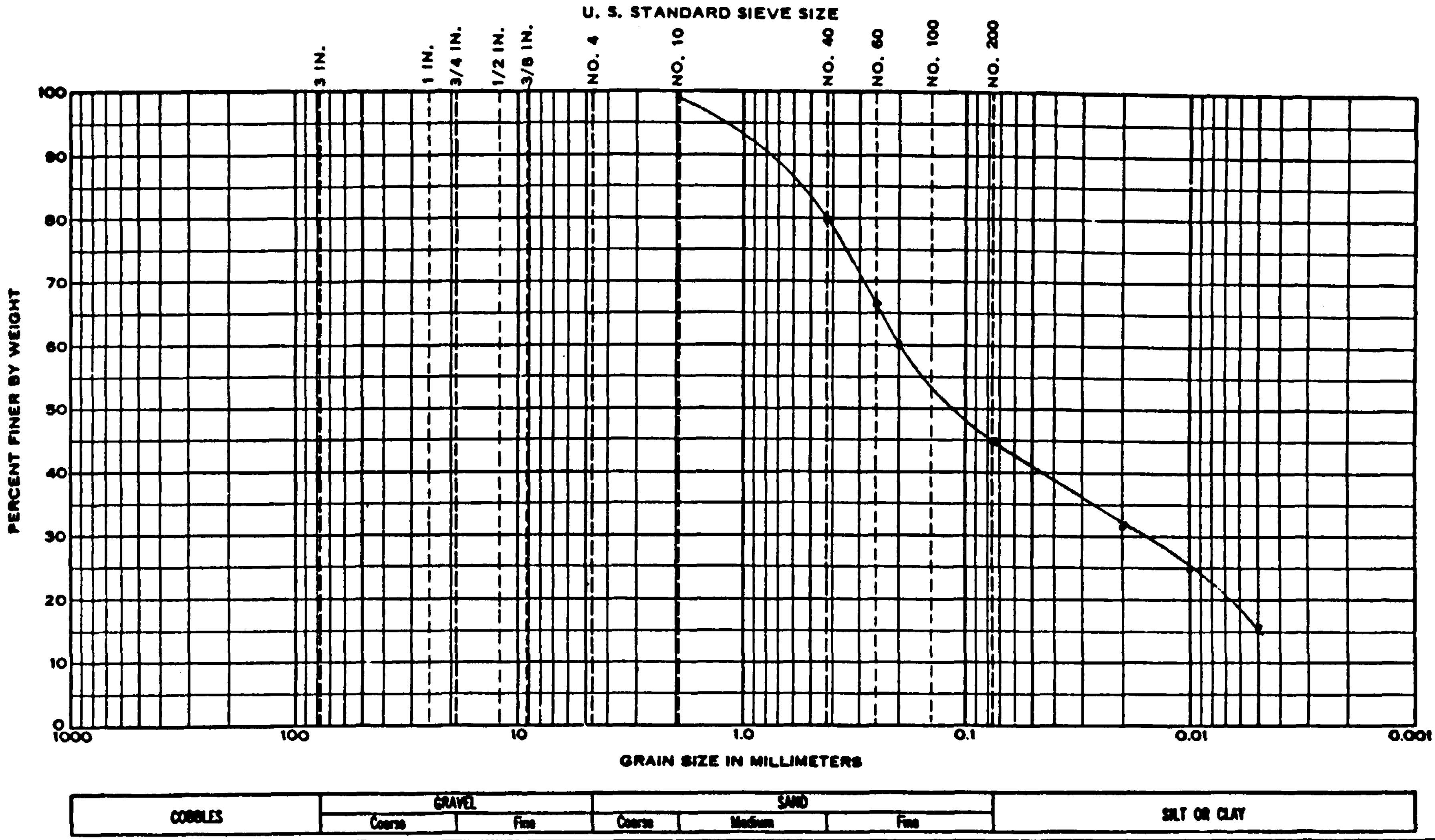
Project: JM500-6

Location: Wright Associates

Date 6/24/85 Made By MP Chkd By JJM

H-4

302342



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	REMARKS:
SB-4	16'-18'		19.6				Sample #5

GRADATION CURVES

BORINGS, SOILS & TESTING CO.
FOUNDATION ENGINEERS
HARRISBURG, PENNSYLVANIA

Project: JM500-6

Location: Wright Associates

Date 6/24/85 | Made By MP | Chkd By JJM

11-5

302343

APPENDIX I

HEALTH AND SAFETY MONITORING REPORTS

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/13/84

Background HNU Reading (Measured at Trailer): 0.8 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air Rotary drilling at D-1

Ambient HNU Readings (Measured in Working Area): 0 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): 0-.03 mr/hr

Level of Protection Required: Level D

Comments: No anomalous readings during drilling.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

r.e. wright associates, inc.

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/14/84

Background HNU Reading (Measured at Trailer): 0.8 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air Rotory Drilling (ARD) at Well D-1
Soil Boring / Rock Coring (SB/RC) at SB-3

Ambient HNU Readings (Measured in Working Area): ARD: 0 ppm
SB/RC: 0-3.2 ppm

Ambient EXP Readings (Measured in Working Area): ARD: 0%
SB/RC: 0%

Ambient RAD Readings (Measured in Working Area): ARD: 0-.03 mr/hr
SB/RC: 0-.03 mr/hr

Level of Protection Required: ARD required Level D
SB/RC required Level D

Comments: On SB-3 an HNU reading taken inside the augers around 4-6' showed nearly 50 ppm; however, when measurment was taken above augers a reading of only 3-5 ppm resulted. Ambient working area was below 5 ppm so Level D used. Eventually the high readings inside the augers also subsided.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/15/84

Background HNU Reading (Measured at Trailer): 0.5 ppm

Background EXP Reading (Measured at Trailer): 0-1%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: Air Rotary Drilling at Well D-1
Soil Boring / Rock Coring at SB-3

Ambient HNU Readings (Measured in Working Area): ARD: 0 ppm
SB/RC: 0-16.5 ppm

Ambient EXP Readings (Measured in Working Area): ARD: 0%
SB/RC: 0-100%

Ambient RAD Readings (Measured in Working Area): ARD: no readings (NR)
SB/RC: 0-.02 mr/hr

Level of Protection Required: ARD required Level D
SB/RC required Level C and Level D
(mostly Level C).

Comments: Most of the very high readings were occuring around the auger heads on SB-3, so any work done in this vicinity was on Level C as detailed in HASP. When working further away from rig or when HNU levels dropped and stayed below 5ppm Level D was resumed.
Both drillers and geologist are on Level C.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/16/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotary Work at Well D-1
Soil Boring/Rock Coring at SB-3

Ambient HNU Readings (Measured in Working Area): ARD: NR
SB/RC: 0-6.0 ppm

Ambient EXP Readings (Measured in Working Area): ARD: NR
SB/RC: 0%

Ambient RAD Readings (Measured in Working Area): ARD: NR
SB/RC: NR

Level of Protection Required: ARD required Level D (determined from previous work).
SB/RC required Level C and Level D

Comments: On SB/RC Level C was required while augering through the saprolite. Readings were greatest around the auger heads.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/19/84

Background HNU Reading (Measured at Trailer): 0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotary Drilling at Well D-1
Soil Boring/Rock Coring at SB-3 (coring)

Ambient HNU Readings (Measured in Working Area): ARD: 0-0.2 ppm
SB/RC: 0 ppm

Ambient EXP Readings (Measured in Working Area): ARD: 0%
SB/RC: 0%

Ambient RAD Readings (Measured in Working Area): ARD: 0-.03 mr/hr
SB/RC: NR

Level of Protection Required: ARD required Level D
SB/RC required Level D

Comments: While constructing piezometer in SB-3 some low level (1-6ppm) HNU readings occured (especially while installing sand pack). These readings were not at high enough levels for a long enough period of time to warrant Level C. I left decision up to Ron Weaver and drillers.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/20/84

Background HNU Reading (Measured at Trailer): 0.1 ppm

Background EXP Reading (Measured at Trailer): 0-1%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: Air Rotary Rig stuck so no work.
Soil Boring / Rock Coring at SB-2

Ambient HNU Readings (Measured in Working Area): ARD: NR
SB/RC: 0-2.0 ppm

Ambient EXP Readings (Measured in Working Area): ARD: NR
SB/RC: 0%

Ambient RAD Readings (Measured in Working Area): ARD: NR
SB/RC: 0-.02 mr/hr

Level of Protection Required: ARD required Level D (no intrusive work)
SB/RC required Level D

Comments: ARD spent day cleaning up at D-1, steam cleaning at Command Post, and being stuck while trying to get to site D-5.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/21/84

Background HNU Reading (Measured at Trailer): 2.0 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: Air Rotory Drilling at Well D-5
Soil Boring/Rock Coring at SB-2

Ambient HNU Readings (Measured in Working Area): ARD: 0-2.4 ppm
SB/RC: 0-5.4 ppm

Ambient EXP Readings (Measured in Working Area): ARD: 0-15%
SB/RC: 0%

Ambient RAD Readings (Measured in Working Area): ARD: 0-.04 mr/hr
SB/RC: 0

Level of Protection Required: ARD required Level D
SB/RC required Level C and Level D
(level C protection was used for soil sampling; once coring started, readings allowed Level D).

Comments: 15% explosive occurred for a very short time near 10' in D-5. Monitoring showed this fell off shortly after 10'.

On-Site Health and Safety Officer: Jeffrey S. Thompson

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/26/84

Background HNU Reading (Measured at Trailer): 0.8 ppm

Background EXP Reading (Measured at Trailer): 0-5%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air Rotory Drilling at Well D-5
Soil Boring / Rock Coring at SB-2 (piezometer construction)

Ambient HNU Readings (Measured in Working Area): ARD: 0-1.4 ppm
SB/RC: NR

Ambient EXP Readings (Measured in Working Area): ARD: 5-30%
SB/RC: NR

Ambient RAD Readings (Measured in Working Area): ARD: 0-.03 mr/hr
SB/RC: NR

Level of Protection Required: ARD required Level D
SB/Rc required Level C and D

Comments: EXP was closely monitored on D-5 and most of time remained around 5%. (30% was a peak).
Level C used during construction on SB-2 due to previous HNU readings (11/21/84) and inavailability of HNU for REWAI's use.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/27/84

Background HNU Reading (Measured at Trailer): 0-1ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): 0-.03 mr/hr

Work Area and Task: Air Rotary Work at D-5 (installing casing)
Soil Boring/Rock Coring at SB-4

Ambient HNU Readings (Measured in Working Area): ARD: NR
SB/RC: 0-5.0ppm

Ambient EXP Readings (Measured in Working Area): ARD: 5-10%
SB/RC: NR

Ambient RAD Readings (Measured in Working Area): ARD: NR
SB/RC: 0-0.3 mr/hr

Level of Protection Required:

ARD required Level D
SB/RC: readings show only level D required but REW decided to follow Level C. Drillers followed Level D.

Comments: ARD: tender truck stuck much of day. Once work began casing was installed to 90' and grouted. EXP readings returned to 0% after this step.

Larry Hoyt (surveyor) on site to look around. I told him to follow Level D protection. (He was staying on roads).

On-Site Health and Safety Officer: Jeffrey D. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/28/84

Background HNU Reading (Measured at Trailer): 0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): 0mr/hr

Work Area and Task: Air Rotory Drilling at Well D-5
Soil Boring / Rock Coring at SB-4

Ambient HNU Readings (Measured in Working Area): ARD: 0-0.2 ppm
SB/RC: NR

Ambient EXP Readings (Measured in Working Area): ARD: 0-5%
SB/RC: NR

Ambient RAD Readings (Measured in Working Area): ARD: 0 mr/hr
SB/RC: 0 mr/hr

Level of Protection Required:
ARD required Level D
SB/RC required Level C

Comments: HNU lost its charge almost immediately. To be safe RCW with the auger rig (SB/RC) decided to follow Level C. I told him this was a good idea.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/29/84

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): 0-3%

Background RAD Reading (Measured at Trailer): 0-.04 mr/hr

Work Area and Task: Air Rotary drilling at Site D-8
Soil Boring/Rock Coring at SB-1

Ambient HNU Readings (Measured in Working Area): ARD: NR
SB/RC: 0ppm

Ambient EXP Readings (Measured in Working Area): ARD: 2-14%
SB/RC: NR

Ambient RAD Readings (Measured in Working Area): ARD: 0-.04 mr/hr
SB/RC: 0-.04 mr/hr

Level of Protection Required:

ARD used Level C protection since Ron Weaver was using HNU on SB-1. Odor indicates something present in overburden. EXP indicates this also.

SB/RC started on Level C but low level HNU responses caused switch to Level D.

Comments:

On-Site Health and Safety Officer: Jeffrey L. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 11/30/84

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotory Drilling on Well D-8
Soil Boring / Rock Coring on site SB-1

Ambient HNU Readings (Measured in Working Area): ARD: 0 - 6.3 ppm
SB/RC: 0 ppm

Ambient EXP Readings (Measured in Working Area): ARD: 0 - 3%
SB/RC: NR

Ambient RAD Readings (Measured in Working Area): ARD: NR
SB/RC: NR

Level of Protection Required:

ARD requires Level C protection.
SB/RC requires Level D protection.

Comments: water in D-8 has a sharp biting odor. water foams also. HNU readings are for the most part under 5.0 ppm but we didn't like the odor, so decided to use Level C. HNU readings inside casing are as high as 10 ppm.

Radiation counter out of service (battery).

Surveyors are on site and a check around the site showed Level D would be sufficient protection.

On-Site Health and Safety Officer:

Jeffrey S. Thompson (REWAI)

302356

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/3/84

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Soil Boring/Rock Coring at SB-1

Ambient HNU Readings (Measured in Working Area): NR

Ambient EXP Readings (Measured in Working Area): NR

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D was used for rock coring and piezometer construction on SB-1.

Comments: No air rotary (deer hunting)
Very heavy rain and wind prevent use of HNU and EXP.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/4/84

Background HNU Reading (Measured at Trailer): 0-2.0 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air Rotary Drilling at S-4
Soil Boring Rock coring at SB-1

Ambient HNU Readings (Measured in Working Area): ARD: 0-3.1 ppm
SB/RC: NR

Ambient EXP Readings (Measured in Working Area): ARD: 3-5%
SB/RC: NR

Ambient RAD Readings (Measured in Working Area): ARD: .01 mr/hr
SB/RC: NR

Level of Protection Required: ARD required Level C protection
SB/RC required Level D protection

Comments: Although HNU readings on S-4 were below 5.0 ppm for the most part, odor in water and cutting necessitated Level C.
SB/RC was just cleaning up.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/5/84

Background HNU Reading (Measured at Trailer): 0.5 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air Rotary work at S-4 (finish well construction)
Air Rotary Drilling at site D-7.

Ambient HNU Readings (Measured in Working Area): 0-0.7ppm (D-7)

Ambient EXP Readings (Measured in Working Area): 0-2% (D-7)

Ambient RAD Readings (Measured in Working Area): 0-.03 mr/hr (D-7)

Level of Protection Required: Level D used to finish S-4 construction
Level C used to drill D-7 (even though HNU is well below 5.0)
Drilling overburden so close to the actual fill made me choose Level C.

Comments: Carl Boyer (REWAI) and Don Toter (NJDEP) on site.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/6/84

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotory work at D-7
Water Levels (whole site)

Ambient HNU Readings (Measured in Working Area): 0-0.4 ppm

Ambient EXP Readings (Measured in Working Area): NR

Ambient RAD Readings (Measured in Working Area): 0.3 ppm

Level of Protection Required: Level D protection was used for all work today.

Comments: Only 1' drilled today. Casing broke downhole. Retrieved as much as possible and hole bentonited shut.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302360

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/7/85

Background HNU Reading (Measured at Trailer): 0.8 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Start new D-7 with Air Rotary rig.

Ambient HNU Readings (Measured in Working Area): 0-1.0 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Air Rotary required Level D protection.

Comments: move away from 1st attempt on D-7 to try new attempt.

On-Site Health and Safety Officer: Ron Weaver (JST)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/10/85 to 12/14/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Work on well D-7 (no intrusive activities)

Ambient HNU Readings (Measured in Working Area): NR

Ambient EXP Readings (Measured in Working Area): NR

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D worn.

Comments: most of day spent trying to pull 8" casing.

On-Site Health and Safety Officer: Ron Weaver (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/17/84

Background HNU Reading (Measured at Trailer): 0-2.0 ppm

Background EXP Reading (Measured at Trailer): 0-3%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotory drilling at Well D-7

Ambient HNU Readings (Measured in Working Area): 0.8 - 5.8 ppm

Ambient EXP Readings (Measured in Working Area): 2-5%

Ambient RAD Readings (Measured in Working Area): 0-.03 mr/hr

Level of Protection Required: Level C protection was worn for all drilling and development at D-7 today.

Comments: Water was very foamy. Oily sheen on surface.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/18/84

Background HNU Reading (Measured at Trailer): 0-1.0 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotary drilling at site S-1 (near D-7)

Ambient HNU Readings (Measured in Working Area): 2.0-4.0 ppm

Ambient EXP Readings (Measured in Working Area): 2-5%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level C was worn due to findings at D-7, and location near fill.

Comments: Ambient HNU readings peaked over 5.0 ppm periodically due to wind from landfill.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/19/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: finish well construction at S-1 and cleanup
Air Rotary: at S-1.
Setup on site D-9.

Ambient HNU Readings (Measured in Working Area): 0- 3.0 ppm

Ambient EXP Readings (Measured in Working Area): 0-2%

Ambient RAD Readings (Measured in Working Area): .03 mr/hr

Level of Protection Required: Level D protection was worn for all work today.

Comments: Water levels taken across site (Level D).

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302365

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/20/84

Background HNU Reading (Measured at Trailer): 0-3 ppm

Background EXP Reading (Measured at Trailer): 0-1%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: Air Rotory drilling at site D-9

Ambient HNU Readings (Measured in Working Area): 0-4 ppm

Ambient EXP Readings (Measured in Working Area): 0-10% (mostly 1-2%)

Ambient RAD Readings (Measured in Working Area): 0-.03 mr/hr

Level of Protection Required: Level C protection was worn most of the time. Level D used periodically further away from hole.

Comments: Occassionally higher HNU readings (5-7ppm) occurred when wind would blow from landfill towards D-9. Landfill odor noticed.

On-Site Health and Safety Officer: Jeffrey D. Thompson (REWAI)

302366

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/21/84

Background HNU Reading (Measured at Trailer): 0-1.0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .02mr/hr

Work Area and Task: Install casing and grout D-9

Ambient HNU Readings (Measured in Working Area): 0-2.0ppm

Ambient EXP Readings (Measured in Working Area): 0-1%

Ambient RAD Readings (Measured in Working Area): 0-.03 mr/hr

Level of Protection Required: Level D protection used for all work.

Comments: Snow flurries and windy. (Landfill doesn't smell).

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/26/84

Background HNU Reading (Measured at Trailer): 0-1.0 ppm

Background EXP Reading (Measured at Trailer): 1-2%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: Air Rotary drilling at D-9

Ambient HNU Readings (Measured in Working Area): 0-2.0 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection worn.

Comments:

On-Site Health and Safety Officer: Ron Weaver (Rewai)

302368

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/27/84

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotary Drilling at S-3.

Ambient HNU Readings (Measured in Working Area): 0-2.0ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level C protection worn due to overburden drilling and proximity to landfill.

Comments: no odor in SE corner.

On-Site Health and Safety Officer: Ron Weaver (Rewai)

302369

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 12/28/84

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: finish well construction on S-3 and grout (ceme) D-5, D-7, D-8 + D-9

Ambient HNU Readings (Measured in Working Area): 0-3.0 ppm

Ambient EXP Readings (Measured in Working Area): 1-2%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection worn at all sites.

Comments:

On-Site Health and Safety Officer: Ron Weaver (REWAI)

302370

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/2/85

Background HNU Reading (Measured at Trailer): 1.0 ppm

Background EXP Reading (Measured at Trailer): 2%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: Air Rotary Drilling on site S-2.

Ambient HNU Readings (Measured in Working Area): 0 - 0.8 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): 0 - .02 mr/hr

Level of Protection Required: Level D protection required for todays work.

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302371

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/3/85

Background HNU Reading (Measured at Trailer): 0-1.0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: work on well S-2 (well construction)

Ambient HNU Readings (Measured in Working Area): 0ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection required.

Comments: Much of day spent trying to pull temporary 10" steel on S-2. Casing is stuck. Broke casing puller.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302372

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/4/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: trying to pull casing on S-2

Ambient HNU Readings (Measured in Working Area): NR

Ambient EXP Readings (Measured in Working Area): NR

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection worn based on previous days work.

Comments: Casing puller broke again.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302373

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/7/85

Background HNU Reading (Measured at Trailer): 0-1.0ppm

Background EXP Reading (Measured at Trailer): 1-2%

Background RAD Reading (Measured at Trailer): .02 - .03 mr/hr

Work Area and Task: Set up on site S-6, grout S-4 & D-8

Ambient HNU Readings (Measured in Working Area): 0ppm

Ambient EXP Readings (Measured in Working Area): 0-1%

Ambient RAD Readings (Measured in Working Area): 0- .02 mr/hr

Level of Protection Required: Level D protection worn for all work today.

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302374

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/8/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotary Drilling at site S-6
Water Levels

Ambient HNU Readings (Measured in Working Area): 0-1.2 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): 0-.02 mr/hr

Level of Protection Required: Level D protection worn based on previous work at well D-1. (Level C available if needed).

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/9/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Drilling and well construction at S-6.

Ambient HNU Readings (Measured in Working Area): 0-0.8 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): 0-.02 mr/hr

Level of Protection Required: Level D protection worn for all work.

Comments: cold temps. are causing freezing problems with the rig.

On-Site Health and Safety Officer: Jeffrey D. Thompson (REWAI)

302376

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/10/85

Background HNU Reading (Measured at Trailer): 0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air Rotary Drilling on Well D-3

Ambient HNU Readings (Measured in Working Area): 0 - 0.5ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): 0 - .03 mr/hr

Level of Protection Required: Level D protection required.

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/11/85

Background HNU Reading (Measured at Trailer): 0-0.25ppm

Background EXP Reading (Measured at Trailer): 0-1%

Background RAD Reading (Measured at Trailer): 0-.02 mr/hr

Work Area and Task: Air Rotary Drilling on Well D-3

Ambient HNU Readings (Measured in Working Area): 0-0.4ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): 0-.04 mr/hr

Level of Protection Required: Level D protection worn.

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (KENAI)

302378

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/14/85

Background HNU Reading (Measured at Trailer): 0- .5ppm

Background EXP Reading (Measured at Trailer): 0-1%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: Air Rotory Drilling at site D-4

Ambient HNU Readings (Measured in Working Area): 0.6-2.2ppm

Ambient EXP Readings (Measured in Working Area): 0-1%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection worn. (Started on Level C for ≤10')

Comments: Rig broke down.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/15/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Fixing rig and installing casing.

Ambient HNU Readings (Measured in Working Area): NR

Ambient EXP Readings (Measured in Working Area): NR

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection worn base on previous days work at this site.

Comments: Very cold temps are affecting HNU + EXP. (Batteries losing charge)

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302380

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/16/85

Background HNU Reading (Measured at Trailer): 0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): 0- .02 mr/hr

Work Area and Task: Work on Well D-4

Ambient HNU Readings (Measured in Working Area): 0- .2ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): .02 mr/hr

Level of Protection Required: Level D protection is worn.

Comments: Very cold again. Instruments won't hold charge long.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302381

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/17/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: no drilling due to snow. Water Levels taken.

Ambient HNU Readings (Measured in Working Area): NR

Ambient EXP Readings (Measured in Working Area): NR

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D worn for water levels based on prior site experience.

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302382

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/18/85

Background HNU Reading (Measured at Trailer): 0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotary Drilling on Well D-4.

Ambient HNU Readings (Measured in Working Area): 0-0.4ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): 0-.02 mr/hr

Level of Protection Required: Level D protection worn.

Comments: ≈4" snow (very cold).

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/21/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: none

Ambient HNU Readings (Measured in Working Area): NR

Ambient EXP Readings (Measured in Working Area): NR

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: none

Comments: No work today due to extreme cold. Health warnings out about prolonged exposure so no work today.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/22/85

Background HNU Reading (Measured at Trailer): 1.0 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air Rotary Drilling on Well S-5.

Ambient HNU Readings (Measured in Working Area): 0.2 - 0.8 ppm

Ambient EXP Readings (Measured in Working Area): 0-1%

Ambient RAD Readings (Measured in Working Area): 0- .03 mr/hr

Level of Protection Required: Level D protection worn.

Comments: Ned Wehler (REWAI) on site.

On-Site Health and Safety Officer: Jeffrey D. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/23/85

Background HNU Reading (Measured at Trailer): 0-1ppm

Background EXP Reading (Measured at Trailer): 0-1%

Background RAD Reading (Measured at Trailer): 0-.02mr/hr

Work Area and Task: Develop well S-5 and begin drilling well D-6.

Ambient HNU Readings (Measured in Working Area): S5: 0ppm
D6: 0-2.0ppm

Ambient EXP Readings (Measured in Working Area): S5: 0%
D6: 15-100%

Ambient RAD Readings (Measured in Working Area): S5: NR
D6: .02

Level of Protection Required: Level D protection on S5.
Level C protection on D-6.
(Drilled to 24' & install 10" casing).

Comments: Explosimeter readings are varying greatly on D-6. Ambient around working area is 0-20%. Peaks of 100% occur inside casing. Hole left to air a bit then proceed cautiously. Levels dropped some after casing installation.

On-Site Health and Safety Officer: Jeffrey S. Thompson

302386

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/24/85

Background HNU Reading (Measured at Trailer): 1.0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotory Drilling at site D-6.

Ambient HNU Readings (Measured in Working Area): 0-4.0ppm

Ambient EXP Readings (Measured in Working Area): 0-10%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level C was worn at all times since hole was being drilled through center of landfill.

Comments: Exp. levels are much lower than yesterday but some high peaks still occur. Carl Boyer (REWAI) on site.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/25/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air Rotary Drilling at site D-6.

Ambient HNU Readings (Measured in Working Area): 0-4.0 ppm

Ambient EXP Readings (Measured in Working Area): 10%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level C protection was worn at all times as a precaution.

Comments: Most of day spent installing 6 and 8" casing. Constant Exp. monitoring carried out during casing installation.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/28/85

Background HNU Reading (Measured at Trailer): 1.0 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Air rotary drilling at site D-6.

Ambient HNU Readings (Measured in Working Area): 0-3.2 ppm

Ambient EXP Readings (Measured in Working Area): 0-12%

Ambient RAD Readings (Measured in Working Area): .02 mr/hr

Level of Protection Required: Level C protection was worn at all times while working on this hole.

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/29/85

Background HNU Reading (Measured at Trailer): 1.2 ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .02 mr/hr

Work Area and Task: grout well D-6 and begin drilling well D-2. Water levels were taken.

Ambient HNU Readings (Measured in Working Area): 0.2 - 0.6 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): .02-.03 mr/hr

Level of Protection Required: Level D protection worn. (Level C available if needed but since D-2 is off-site we didn't start out wearing it).
Level D for water levels.

Comments: Slight odor to water in D-2.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302390

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/30/85

Background HNU Reading (Measured at Trailer): 0ppm

Background EXP Reading (Measured at Trailer): 0%

Background RAD Reading (Measured at Trailer): .02mr/hr

Work Area and Task: Air rotary work at site D-2.

Ambient HNU Readings (Measured in Working Area): 0-0.4ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): .02mr/hr

Level of Protection Required: Level D protection worn.

Comments: Water has a slight odor.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302391

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 1/31/85

Background HNU Reading (Measured at Trailer): 0-1ppm

Background EXP Reading (Measured at Trailer): 0-1%

Background RAD Reading (Measured at Trailer): .03 mr/hr

Work Area and Task: Air rotory drilling at Well D-2

Ambient HNU Readings (Measured in Working Area): 0-1.4 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): .02-.03 mr/hr

Level of Protection Required: Level D protection worn.

Comments:

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302392

r.e. wright associates, inc.

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 2/19/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Work on Well S-2 (try to pull casing). Surveyors on site.

Ambient HNU Readings (Measured in Working Area): 0-1.0 ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection worn. Surveyors on Level D.

Comments: Casing not coming out.

On-Site Health and Safety Officer: Jeffrey S. Thompson (?) JSG

302393

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 2/20/85

Background HNU Reading (Measured at Trailer): NR

Background EXP Reading (Measured at Trailer): NR

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Work on Well S-2 (try to pull casing)
Surveyors on site.

Ambient HNU Readings (Measured in Working Area): 0ppm

Ambient EXP Readings (Measured in Working Area): 0%

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection worn.
Surveyors on level D.

Comments: Casing puller broke, casing stayed in hole.

On-Site Health and Safety Officer: Jeffrey S. Thompson (Recinti)

302394

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COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 8/27/85

Background HNU Reading (Measured at Trailer): 0.25 ppm

Background EXP Reading (Measured at Trailer): 1% (OXYGEN METER 20.4%)

Background RAD Reading (Measured at Trailer): NR

Work Area and Task: Monitoring Well Sampling
Test Pit Investigations

Ambient HNU Readings (Measured in Working Area): Test Pits (for wells see below)

Ambient EXP Readings (Measured in Working Area):

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level C protection was worn for all test pit work.

Monitoring Wells

	HNU	EXP	OXYGEN
D-5	0-0.25	1%	20.5%
D-1	0-0.25	0-1%	20.2%
D-2	0-0.25	0%	20.5%
D-4	0-0.25	0-1%	20.4%
S-6	0-0.25	0-1%	20.4%
S-5	0-0.25	0-1%	20.5%

Inside well casings are all ok.
Level D worn for sampling.

Comments: LMS is sampling monitoring wells.
NJDEP is on site to observe.

On-Site Health and Safety Officer: Jeffrey S. Thompson (REWAI)

302395

r.e. wright associates, inc.

COMBE-FILL SOUTH LANDFILL

DAILY HEALTH AND SAFETY REPORT

Date: 8/25/85

Background HNU Reading (Measured at Trailer): 1.0 ppm

Background EXP Reading (Measured at Trailer): 1%

Background RAD Reading (Measured at Trailer): 20.6%

Work Area and Task:

Ambient HNU Readings (Measured in Working Area): Well D-2 / 0-1.0 ppm

Ambient EXP Readings (Measured in Working Area): 0% (Oxy: 20.6%)

Ambient RAD Readings (Measured in Working Area): NR

Level of Protection Required: Level D protection required.

Comments: Also rechecked Wells D-1, D-4, S-6, S-5, and D-5 and all were safe for Level D.
LMS on site.
(Problems occurring so sampling not finished).

On-Site Health and Safety Officer: Jeffrey B. Thompson (REWAI)

302396

r.e. wright associates, inc.

MEMORANDUM

To: File 85100

From: Kent V. Littlefield KVL

Date: September 18, 1985

Re: Combe South Air Sampling

Arrived at the site at around 11:00 a.m. Met Howard Leeman and Matt Reilly of U.S. Testing, who are running the air sampling study. I traveled with them to the sampling locations and they are designated as follows for today: A-8 is located approximately 200 feet south of DW-6 on top of the landfill, A-10 is approximately 150 feet west of DW-6 on top of the landfill, and A-12 and A-12 duplicate are located at the north portion of the landfill on the mass approximately 100 to 200 feet northeast of the old shop. D-4 is the designated upwind sampling location located out on the pasture to the west of the site. UD-2 is the downwind sampling location located at the curve in the entrance road on the east section of the site where the two access roads split.

Background HNU readings were 2 ppm; however, some readings may have been caused by the high gasoline vapor content in the truck at about 5-10 ppm. Explosive conditions were not noted nor any HNU readings above background at any of the sampling points. Following initial recon of these sites, I had the HNU malfunction and could not be used for the remainder of the field investigation. U.S. Testing left the site at 1430 hours for lunch and returned at 1600 hours to continue operation of the equipment.

The testing equipment includes a high volume particulate sampler which consists of an eight-inch by eight-inch piece of filter paper with a high-volume blower drawing air through it. The organic vapor detectors are battery-powered pumps and are housed within a sheet metal enclosure approximately eight inches off the ground.

I noted that at some locations, the gasoline powered generators, which provide the power for the high volume air sampling, were upwind from the sample location. This was particularly true at sampling point A-8 and I requested the generator be relocated to lateral wind direction. The same was true for A-12, although not as direct a line. However, we relocated that generator as well. The sampling was completed around 1730 hours and we left the site at that time.

5100M5

MEMORANDUM

To: File 85100 - Combe Fill South Air Sampling

From: Kent V. Littlefield KVL

Date: September 19, 1985

Re: Combe South Air Sampling

Arrived at the site at 8:15 a.m. Downwind sampler was not activated as yet. When I arrived at the trailer, only one generator was on. The personnel from U. S. Testing were on site at approximately 8:00 a.m. Between 8:00 a.m. and 9:00 a.m., they began the third and last day of air sampling.

5100M1

Carl 85100

MEMORANDUM

To: Ruth M. Maikish
Project Manager-LMS
File 85100-Combe Fill South Landfill HSO Monitoring
File 8455-Combe Fill South Landfill-Field Notes/Correspondence

From: Carl G. Boyer REWAI Project Manager

Date: October 9, 1985

Re: Leachate Seep Reconnaissance

1100 - Arrived Combe South Landfill, the gate is locked all appears secure, there is a full 55-gallon drum of potable water remaining from the sampling events last month. The water has gone somewhat rusty. Someone has placed a concrete block inside the gate at the center. It does not appear to have any purpose. The trailer is empty with the exception of bees, the soil samples from the soil boring rock coring, the submersible pumps pulled from the existing deep wells on site, and one or two miscellaneous small items.

I have suited up in Level D protection including Tyvek rubber boots and inner gloves. I have mobilized a photovac TIP photoionization detector. This detector functions very much the same way as an HNU photoionization detector, however, an HNU was not available. Background readings at the trailer using the TIP photoionization detector (PID) at 0.4 ppm. Using a nuetronics exotox gas montior, explosivity is at 2 percent, oxygen at 5 percent, background radiation at .02 millirems per hour (mR). Temperature is approximately 70 to 72 degrees, the sun is shining, the wind is fairly steady at about 5 to 10 mph to the northeast (using the New Jersey power line as a north/south orientation.) There are no distinct landfill odors at the site so far.

1125 - Having suited up, I am now at Leachate Seep #2 to the immediate east of Well D-8. The site is marked by a LMS stake with green and orange paint. The seep is wet and flowing. There is standing water in a circular area around the stake roughly measuring five feet in radius. The depth of the fluid is about one to two inches overall. There is a distinct sheen at the surface in many areas.

Aside from the sheen the water appears to be generally clear with a red hue. There is a cottony like algal or fungus growth on the submerged rock surfaces. There is also a small white flag which I have just noticed in the seep area. It is labelled ERT-08.

302399

There is a steady trickling through this area. I would guess that the rate of fluid influx to be about Ø.25 gpm. There is no change in background readings of the PID, explosimeter, or radiation detector in this area. There are no anomalous readings at the seep surface with the PID either.

Leachate Site L-3

I am at the first ditch crossing the access road along the east face of the landfill. There is flow across this ditch. Site L-3 is to the immediate southwest of the ditch. There is standing water immediately downgradient from the stake, which I assume marks Site L-3. The stake is very weathered and has no legible markings on it. However, there is bubbling in the puddle at the base of the stake. As I recall, this was a very effervescent site last July. This entire area, however, was as dry as a bone last month. There is standing water in this area about one-quarter to one-half inch in depth overall. The bubbling at the seep site is at a rate of perhaps one one-half inch bubble per second, nothing dramatic, but nonetheless present. Areas adjacent to the seep and present standing water appear to have been recently saturated. Therefore, I would assume that the saturation now evident is receding at an unknown rate. There are deer tracks all around the seep, this is apparently a watering hole.

HNU readings maintained at about Ø.1 to Ø.4 (background). No change in explosivity or radiation, however, I do pick up an occassional whiff of landfill odor, nothing severe.

The sheen at the surface prevalent at Leachate Site #2 is not present here. Also, this seep area has a green hue as opposed to the red hue noticed at Site L-2. There are no positive readings on the PID at the bubbling point at Site L-3. The bubbling is taking place at a lip in the soil surface, I cannot make direct access with the explosimeter to measure methane content since I do not have a probe extension similar to the PID.

As I think I said before, I cannot ascertain the rate of fluid influx to Site L-3. The ditch across the access road to the north of Site L-3 is flowing at a very slow rate, perhaps slower than Ø.25 gpm, probably close to Ø.1 gpm. There is a small amount of ponding here. The hue at this site is also green.

1150 - The second ditch crossing the access road, located to the south of L-3 is also wet. There is no measurable flow rate, however, it is nevertheless wet in contrast to the dryness observed last month. Signs of adjacent dampness indicate that the "flow" is in recession.

1200 - Near Well D-9, as usual, the landfill odor is very distinct in this area PID is 0.4 ppm in ambient conditions. Measurements in the crevice at the perimeter of the landfill in this area were up to 2 ppm using the PID.

Leachate Site L-4

There was evidence of distinct leachate flow at this site. There is a reddish-black oozy-like stain coming from the toe of the site in this area, proceeding to the southwest and following the haul road to the west for perhaps 75 to 100 feet until it comingles with leachate coming from Seep #5. There is no measurable flow or visible evident flow in this seep or leachate Seep #5. However, there was undoubtedly a fair amount of movement recently. Last month this area was dry. It is possible that leachate collection for chemical analyses could be performed here by digging a hole and allowing leachate to collect. However, I doubt if much could be collected in a days' time.

Background PID measurements is 0.4 ppm, Nominal increases at the leachate seep surface to perhaps .1 ppm above background at the most.

This seep is located along the south face of the landfill and is marked at the highest point of seep emergence by a stake labelled S #4, painted green and orange.

Leachate Seep Site L-5

This seep is also located along the south face of the landfill approximately 100 feet west of Site L-4. This is also marked by a stake with green and orange paint labelled L-5. The conditions here are similar to those witnessed at Leachate Seep Site L-4. There is a reddish-black discharge approximately six feet above the toe of the slope. There is no measurable or visible flow, however, although the seep discharge is obviously wet. Background PID measurement have increased to about 1.3 ppm in the area. I have no ready explanation for this, it does not seem to be the leachate. There is a white flag at the toe of the slope in the path of the leachate, marked ERT1. Noteworthy along the slope to the west of L-5 is that there are several former seep discharge areas evidenced by red staining on the slope. These areas are dry now in contrast to the recently active areas described above.

Leachate Seep Site L-6

1220 - This site is located to the north of the southwest corner of the landfill along the western face. It is marked with a stake painted green and orange and labelled L-6. Recent leachate flow in this area is evident. The conditions are similar to those found at Sites L-4 and L-5. There is, however, a slight trickling flow approximately 10 feet immediately downgradient from the stake. I would estimate the flow rate at perhaps two pints per hour. There is a small puddle of standing leachate at the base of the stake. This puddle measures approximately one foot in diameter at a depth of perhaps two inches. There is a film or sheen at the surface of the leachate. It is difficult to estimate flow, however, I would estimate that there is a flow under the film similar to that described above.

There are four small flags in the leachate flow path downgradient from the stake about 15 feet. Three are yellow and are labelled C-6-11, C-6-7, and C-6-3 the fourth flag is labelled ERT-5.

Former seep areas adjacent to this seep are also evidenced by red staining on the slope. These areas do not appear to be active, at least within the recent past.

There are one or two additional seep outlets downgradient from Site #6 that are presently wet. However, no measurable flow is evident. At the toe of the slope downgradient from Site L-6 within the grassy area, there are small segregated pools of standing leachate, probably intermixed with runoff. Due to the high grass, it is difficult to quantify this area, however, I would estimate that the collection area is oval-shaped long access perhaps 75 feet parallel to the toe of the slope, short access perhaps 20 feet, overall fluid depth average 1 inch. There are three additional yellow flags on the slope further downgradient from Site L-6 labelled C-6-10, C-6-6, and C-6-2. There is at least two additional flags further downgradient along the leachate flow path.

As noted in other areas, the moisture staining adjacent to the active seep areas indicate recession.

Leachate Seep Site L-7

1250 - I tried to get to Site L-7 which is located on the west face of the landfill. This area is very heavily vegetated. There is an active seep located anomalously high on the landfill slope, I would estimate approximately 25 feet vertically from the top (perhaps 5 feet less). It is wet but there is no visible flow coming from it. There are residual leachate stains further upslope from this one these are, however, dry. I am trying to work my way downslope in the general direction of L-7. There are several leachate seep areas along this slope, which are located to the southeast of the "dead tree" at the toe of the west face of the landfill. These areas can at best be described as soggy with no visible flow. They are wet.

About midway down the slope and approximately 150 feet southeast of the fallen tree at the toe of the slope, there is a bubbling seep area that is actively omitting gas. Fluid flow is not measurable, at the most a trickle, if a collection could be excavated. The sound of bubbling and gas emissions in this area could be easily discernible above other noises. This site is about halfway down the slope.

Continuing further, I am looking for a marker indicating Site L-7. There are several very active gas vents in this area.

I see the stake marking Site L-7. It is just downgradient and approximately 100 feet south and west of the vents described above. The side of the slope leading to Site L-7 is muddy. The characteristic leachate red hue is absent here. If anything, there is a slight green hue.

At site L-7, there is a small puddle just downslope from the stake. There are occassional air bubbles coming out of the puddle which measures perhaps two feet in length by one foot in width with standing fluid approximately two to three inches in depth. There is no visible flow from the puddle, but there is a flow path continuing down the side of the slope to the toe of the slope. There are small puddle collection areas along this slope path. The seep here does not have the black-red coloration of seeps further to the south along this face and along the south face. There is some sheen at the surface, but the overall hue, if any, is green.

The toe of the slope is located approximately 15 feet downgradient from L-7. The area can be describe generally as soggy with small collection areas for leachate and surface runoff. There are some reed patches.

PID readings at Site L-7 are at .6 ppm (surrounding conditions). No above background readings obtained at the fluid surface at L-7.

Going back up the slope to the top of the landfill at the air vents noted before, PID readings at the vents measured at 1.7 ppm. Ambient conditions measured at Ø.6 ppm. Explosivity exceeds 5Ø percent after three seconds of exposure at the vent surface. In summary, the vent seems to be essentially all methane with perhaps one ppm other gases.

There is a small crevice area at the top of the landfill immediately upgradient from Site L-7. This crevice measures approximately 15 feet in length. There does not appear to be a great amount of positive air flow from the crevice which parallels the west face of the landfill. There are no positive PID readings inside the crevice nor are there positive explosimeter readings inside the crevice.

1330 - Moving along the top of the landfill in the vicinity of Well D-6, the landfill odor in this area is nauseating as usual. PID reading at 1 ppm. I am going to circle the northwest corner of the fill to access Site L-8.

At the northwest corner of the landfill, the run at the toe of the slope in this area is dry and shows only small signs of recent moisture. This is particularly in the small sediment fan at the outwash area of this gully. I believe Site L-8 is in this area somewhere, if my recollection serves me correctly. A green and yellow-orange stake is to the immediate south of a stand of dead trees in an area that used to contain ponded water. This water is thickly vegetated with tall grass and at best can be described as slightly moist to dry. The stake is marked Seep #12. This is not leachate seep Site #8. I assume L-8 must be to the south of my position.

About 50 feet south of the stake marking L-12, there is a small pond measuring about 15 feet by 6 feet, water in the pond is standing at a depth of about 3 to 4 inches. There are two used tires in the pond. To the immediate south of this ponded area there are some seep flow paths. The ground can be described as muddy, but a distinct flow is not evident.

PID remains at about .6 ppm background. There are several seeps in this area similar in flow characteristics to that of Site L-7 with small puddles, but no visible flow. I assume Site L-8 is in this vicinity somewhere, however, I do not see any stakes. I am now about 200 to 300 feet north of where I was when looking for Site L-7. If L-8 is in this area, I believe that is safe to assume that flow characteristics are similar to the rest of the seeps on this face of the landfill.

1355 - Having progressed further south along the west face of the slope, I have found <u>Leachate Site L-8</u>. There is a visible trickle coming from this seep. The seep can be described as having a dark green to blacking hue with a definite sheen at the surface. There are frogs living in this small puddle at the seep outlet. I would estimate the flow from this seep to be approximately 0.1 gallons per minute. The stake is marked with green paint and labelled L-8. The flow appears to continue downslope to the toe of the slope where it joins with other seep flows and collective surface runoff.

This site is located immediately upgradient from a dead tree stand marked further by some lying dead tree stumps at the toe of the slope. There appears to be a pond immediately behind the tree line. PID readings remain at background with no distinct increases at the leachate surface.

<u>Leachate Seep L-1</u>

1410 - I'm in the vicinity of Site L-1, in the reeds area on the west face of the "old fill". I have found a stake with green paint on the top, however, there is no writing on the stake. There is a puddle of leachate near the base of the stake measuring perhaps 1.5 feet in diameter by three to four inches in depth. There are bubbles coming from the base of the puddle. The bubbling is sporatic and not very violent. In volume, I would estimate approximately one bubble measuring one inch in diameter per five seconds.

There is a very small trickle flowing down slope from the puddle along the leachate flow path. The trickle is to small to visually quantify.

The drainage swale downgradient from Site L-1 is for all practical purposes dry. There is no flow in this swale. The sediment is moist to saturated, but there appears to be no channelling of runoff or leachate. Further north toward the New Jersey Power Company tower, downgradient from Site L-1, there is some pooling of leachate and/or runoff within the reeds in that area. The depth of the standing water in this area is probably no more than one inch.

1500 - Have called Karen Wright at LMS and relayed the above information. Adequate decontamination and equipment packed up, I am leaving the site.

1515 - Site secure.

5100M2

MEMORANDUM

To: File 85100

From: Kent V. Littlefield KVL

Date: September 18, 1985

Re: Combe South Air Sampling

Arrived at the site at around 11:00 a.m. Met Howard Leeman and Matt Reilly of U.S. Testing, who are running the air sampling study. I traveled with them to the sampling locations and they are designated as follows for today: A-8 is located approximately 200 feet south of DW-6 on top of the landfill, A-10 is approximately 150 feet west of DW-6 on top of the landfill, and A-12 and A-12 duplicate are located at the north portion of the landfill on the mass approximately 100 to 200 feet northeast of the old shop. D-4 is the designated upwind sampling location located out on the pasture to the west of the site. UD-2 is the downwind sampling location located at the curve in the entrance road on the east section of the site where the two access roads split.

Background HNU readings were 2 ppm; however, some readings may have been caused by the high gasoline vapor content in the truck at about 5-10 ppm. Explosive conditions were not noted nor any HNU readings above background at any of the sampling points. Following initial recon of these sites, I had the HNU malfunction and could not be used for the remainder of the field investigation. U.S. Testing left the site at 1430 hours for lunch and returned at 1600 hours to continue operation of the equipment.

The testing equipment includes a high volume particulate sampler which consists of an eight-inch by eight-inch piece of filter paper with a high-volume blower drawing air through it. The organic vapor detectors are battery-powered pumps and are housed within a sheet metal enclosure approximately eight inches off the ground.

I noted that at some locations, the gasoline powered generators, which provide the power for the high volume air sampling, were upwind from the sample location. This was particularly true at sampling point A-8 and I requested the generator be relocated to lateral wind direction. The same was true for A-12, although not as direct a line. However, we relocated that generator as well. The sampling was completed around 1730 hours and we left the site at that time.

5100M5

MEMORANDUM

To: File 85100 - Combe Fill South Air Sampling

From: Kent V. Littlefield KVL

Date: September 19, 1985

Re: Combe South Air Sampling

Arrived at the site at 8:15 a.m. Downwind sampler was not activated as yet. When I arrived at the trailer, only one generator was on. The personnel from U. S. Testing were on site at approximately 8:00 a.m. Between 8:00 a.m. and 9:00 a.m., they began the third and last day of air sampling.

5100M1

Carl F5100

MEMORANDUM

To: Ruth M. Maikish
Project Manager-LMS
File 85100-Combe Fill South Landfill HSO Monitoring
File 8455-Combe Fill South Landfill-Field Notes/Correspondence

From: Carl G. Boyer REWAI Project Manager

Date: October 9, 1985

Re: Leachate Seep Reconnaissance

1100 - Arrived Combe South Landfill, the gate is locked all appears secure, there is a full 55-gallon drum of potable water remaining from the sampling events last month. The water has gone somewhat rusty. Someone has placed a concrete block inside the gate at the center. It does not appear to have any purpose. The trailer is empty with the exception of bees, the soil samples from the soil boring rock coring, the submersible pumps pulled from the existing deep wells on site, and one or two miscellaneous small items.

I have suited up in Level D protection including Tyvek rubber boots and inner gloves. I have mobilized a photovac TIP photoionization detector. This detector functions very much the same way as an HNU photoionization detector, however, an HNU was not available. Background readings at the trailer using the TIP photoionization detector (PID) at 0.4 ppm. Using a nuetronics exotox gas montior, explosivity is at 2 percent, oxygen at 5 percent, background radiation at .02 millirems per hour (mR). Temperature is approximately 70 to 72 degrees, the sun is shining, the wind is fairly steady at about 5 to 10 mph to the northeast (using the New Jersey power line as a north/south orientation.) There are no distinct landfill odors at the site so far.

1125 - Having suited up, I am now at Leachate Seep #2 to the immediate east of Well D-8. The site is marked by a LMS stake with green and orange paint. The seep is wet and flowing. There is standing water in a circular area around the stake roughly measuring five feet in radius. The depth of the fluid is about one to two inches overall. There is a distinct sheen at the surface in many areas.

Aside from the sheen the water appears to be generally clear with a red hue. There is a cottony like algal or fungus growth on the submerged rock surfaces. There is also a small white flag which I have just noticed in the seep area. It is labelled ERT-08.

302409

There is a steady trickling through this area. I would guess that the rate of fluid influx to be about 0.25 gpm. There is no change in background readings of the PID, explosimeter, or radiation detector in this area. There are no anomalous readings at the seep surface with the PID either.

Leachatc Site L-3

I am at the first ditch crossing the access road along the east face of the landfill. There is flow across this ditch. Site L-3 is to the immediate southwest of the ditch. There is standing water immediately downgradient from the stake, which I assume marks Site L-3. The stake is very weathered and has no legible markings on it. However, there is bubbling in the puddle at the base of the stake. As I recall, this was a very effervescent site last July. This entire area, however, was as dry as a bone last month. There is standing water in this area about one-quarter to one-half inch in depth overall. The bubbling at the seep site is at a rate of perhaps one one-half inch bubble per second, nothing dramatic, but nonetheless present. Areas adjacent to the seep and present standing water appear to have been recently saturated. Therefore, I would assume that the saturation now evident is receding at an unknown rate. There are deer tracks all around the seep, this is apparently a watering hole.

HNU readings maintained at about 0.1 to 0.4 (background). No change in explosivity or radiation, however, I do pick up an occassional whiff of landfill odor, nothing severe.

The sheen at the surface prevalent at Leachate Site #2 is not present here. Also, this seep area has a green hue as opposed to the red hue noticed at Site L-2. There are no positive readings on the PID at the bubbling point at Site L-3. The bubbling is taking place at a lip in the soil surface, I cannot make direct access with the explosimeter to measure methane content since I do not have a probe extension similar to the PID.

As I think I said before, I cannot ascertain the rate of fluid influx to Site L-3. The ditch across the access road to the north of Site L-3 is flowing at a very slow rate, perhaps slower than 0.25 gpm, probably close to 0.1 gpm. There is a small amount of ponding here. The hue at this site is also green.

1150 - The second ditch crossing the access road, located to the south of L-3 is also wet. There is no measurable flow rate, however, it is nevertheless wet in contrast to the dryness observed last month. Signs of adjacent dampness indicate that the "flow" is in recession.

1200 - Near Well D-9, as usual, the landfill odor is very distinct in this area PID is 0.4 ppm in ambient conditions. Measurements in the crevice at the perimeter of the landfill in this area were up to 2 ppm using the PID.

Leachate Site L-4

There was evidence of distinct leachate flow at this site. There is a reddish-black oozy-like stain coming from the toe of the site in this area, proceeding to the southwest and following the haul road to the west for perhaps 75 to 100 feet until it comingles with leachate coming from Seep #5. There is no measurable flow or visible evident flow in this seep or leachate Seep #5. However, there was undoubtedly a fair amount of movement recently. Last month this area was dry. It is possible that leachate collection for chemical analyses could be performed here by digging a hole and allowing leachate to collect. However, I doubt if much could be collected in a days' time.

Background PID measurements is 0.4 ppm, Nominal increases at the leachate seep surface to perhaps .1 ppm above background at the most.

This seep is located along the south face of the landfill and is marked at the highest point of seep emergence by a stake labelled S #4, painted green and orange.

Leachate Seep Site L-5

This seep is also located along the south face of the landfill approximately 100 feet west of Site L-4. This is also marked by a stake with green and orange paint labelled L-5. The conditions here are similar to those witnessed at Leachate Seep Site L-4. There is a reddish-black discharge approximately six feet above the toe of the slope. There is no measurable or visible flow, however, although the seep discharge is obviously wet. Background PID measurement have increased to about 1.3 ppm in the area. I have no ready explanation for this, it does not seem to be the leachate. There is a white flag at the toe of the slope in the path of the leachate, marked ERT1. Noteworthy along the slope to the west of L-5 is that there are several former seep discharge areas evidenced by red staining on the slope. These areas are dry now in contrast to the recently active areas described above.

Leachate Seep Site L-6

1220 - This site is located to the north of the southwest corner of the landfill along the western face. It is marked with a stake painted green and orange and labelled L-6. Recent leachate flow in this area is evident. The conditions are similar to those found at Sites L-4 and L-5. There is, however, a slight trickling flow approximately 10 feet immediately downgradient from the stake. I would estimate the flow rate at perhaps two pints per hour. There is a small puddle of standing leachate at the base of the stake. This puddle measures approximately one foot in diameter at a depth of perhaps two inches. There is a film or sheen at the surface of the leachate. It is difficult to estimate flow, however, I would estimate that there is a flow under the film similar to that described above.

There are four small flags in the leachate flow path downgradient from the stake about 15 feet. Three are yellow and are labelled C-6-11, C-6-7, and C-6-3 the fourth flag is labelled ERT-5.

Former seep areas adjacent to this seep are also evidenced by red staining on the slope. These areas do not appear to be active, at least within the recent past.

There are one or two additional seep outlets downgradient from Site #6 that are presently wet. However, no measurable flow is evident. At the toe of the slope downgradient from Site L-6 within the grassy area, there are small segregated pools of standing leachate, probably intermixed with runoff. Due to the high grass, it is difficult to quantify this area, however, I would estimate that the collection area is oval-shaped long access perhaps 75 feet parallel to the toe of the slope, short access perhaps 20 feet, overall fluid depth average 1 inch. There are three additional yellow flags on the slope further downgradient from Site L-6 labelled C-6-10, C-6-6, and C-6-2. There is at least two additional flags further downgradient along the leachate flow path.

As noted in other areas, the moisture staining adjacent to the active seep areas indicate recession.

Leachate Seep Site L-7

1250 - I tried to get to Site L-7 which is located on the west face of the landfill. This area is very heavily vegetated. There is an active seep located anomalously high on the landfill slope, I would estimate approximately 25 feet vertically from the top (perhaps 5 feet less). It is wet but there is no visible flow coming from it. There are residual leachate stains further upslope from this one these are, however, dry. I am trying to work my way downslope in the general direction of L-7. There are several leachate seep areas along this slope, which are located to the southeast of the "dead tree" at the toe of the west face of the landfill. These areas can at best be described as soggy with no visible flow. They are wet.

About midway down the slope and approximately 150 feet southeast of the fallen tree at the toe of the slope, there is a bubbling seep area that is actively omitting gas. Fluid flow is not measurable, at the most a trickle, if a collection could be excavated. The sound of bubbling and gas emissions in this area could be easily discernible above other noises. This site is about halfway down the slope.

Continuing further, I am looking for a marker indicating Site L-7. There are several very active gas vents in this area.

I see the stake marking Site L-7. It is just downgradient and approximately 100 feet south and west of the vents described above. The side of the slope leading to Site L-7 is muddy. The characteristic leachate red hue is absent here. If anything, there is a slight green hue.

At site L-7, there is a small puddle just downslope from the stake. There are occassional air bubbles coming out of the puddle which measures perhaps two feet in length by one foot in width with standing fluid approximately two to three inches in depth. There is no visible flow from the puddle, but there is a flow path continuing down the side of the slope to the toe of the slope. There are small puddle collection areas along this slope path. The seep here does not have the black-red coloration of seeps further to the south along this face and along the south face. There is some sheen at the surface, but the overall hue, if any, is green.

The toe of the slope is located approximately 15 feet downgradient from L-7. The area can be describe generally as soggy with small collection areas for leachate and surface runoff. There are some reed patches.

PID readings at Site L-7 are at .6 ppm (surrounding conditions). No above background readings obtained at the fluid surface at L-7.

Going back up the slope to the top of the landfill at the air vents noted before, PID readings at the vents measured at 1.7 ppm. Ambient conditions measured at 0.6 ppm. Explosivity exceeds 50 percent after three seconds of exposure at the vent surface. In summary, the vent seems to be essentially all methane with perhaps one ppm other gases.

There is a small crevice area at the top of the landfill immediately upgradient from Site L-7. This crevice measures approximately 15 feet in length. There does not appear to be a great amount of positive air flow from the crevice which parallels the west face of the landfill. There are no positive PID readings inside the crevice nor are there positive explosimeter readings inside the crevice.

1330 - Moving along the top of the landfill in the vicinity of Well D-6, the landfill odor in this area is nauseating as usual. PID reading at 1 ppm. I am going to circle the northwest corner of the fill to access Site L-8.

At the northwest corner of the landfill, the run at the toe of the slope in this area is dry and shows only small signs of recent moisture. This is particularly in the small sediment fan at the outwash area of this gully. I believe Site L-8 is in this area somewhere, if my recollection serves me correctly. A green and yellow-orange stake is to the immediate south of a stand of dead trees in an area that used to contain ponded water. This water is thickly vegetated with tall grass and at best can be described as slightly moist to dry. The stake is marked Seep #12. This is not leachate seep Site #8. I assume L-8 must be to the south of my position.

About 50 feet south of the stake marking L-12, there is a small pond measuring about 15 feet by 6 feet, water in the pond is standing at a depth of about 3 to 4 inches. There are two used tires in the pond. To the immediate south of this ponded area there are some seep flow paths. The ground can be described as muddy, but a distinct flow is not evident.

PID remains at about .6 ppm background. There are several seeps in this area similar in flow characteristics to that of Site L-7 with small puddles, but no visible flow. I assume Site L-8 is in this vicinity somewhere, however, I do not see any stakes. I am now about 200 to 300 feet north of where I was when looking for Site L-7. If L-8 is in this area, I believe that is safe to assume that flow characteristics are similar to the rest of the seeps on this face of the landfill.

1355 - Having progressed further south along the west face of the slope, I have found Leachate Site L-8. There is a visible trickle coming from this seep. The seep can be described as having a dark green to blacking hue with a definite sheen at the surface. There are frogs living in this small puddle at the seep outlet. I would estimate the flow from this seep to be approximately 0.1 gallons per minute. The stake is marked with green paint and labelled L-8. The flow appears to continue downslope to the toe of the slope where it joins with other seep flows and collective surface runoff.

This site is located immediately upgradient from a dead tree stand marked further by some lying dead tree stumps at the toe of the slope. There appears to be a pond immediately behind the tree line. PID readings remain at background with no distinct increases at the leachate surface.

Leachate Seep L-1

1410 - I'm in the vicinity of Site L-1, in the reeds area on the west face of the "old fill". I have found a stake with green paint on the top, however, there is no writing on the stake. There is a puddle of leachate near the base of the stake measuring perhaps 1.5 feet in diameter by three to four inches in depth. There are bubbles coming from the base of the puddle. The bubbling is sporatic and not very violent. In volume, I would estimate approximately one bubble measuring one inch in diameter per five seconds.

There is a very small trickle flowing down slope from the puddle along the leachate flow path. The trickle is to small to visually quantify.

The drainage swale downgradient from Site L-1 is for all practical purposes dry. There is no flow in this swale. The sediment is moist to saturated, but there appears to be no channelling of runoff or leachate. Further north toward the New Jersey Power Company tower, downgradient from Site L-1, there is some pooling of leachate and/or runoff within the reeds in that area. The depth of the standing water in this area is probably no more than one inch.

1500 - Have called Karen Wright at LMS and relayed the above information. Adequate decontamination and equipment packed up, I am leaving the site.

1515 - Site secure.

APPENDIX J

COMBE FILL SOUTH LANDFILL

HAND AUGERED SOIL SAMPLES

SOIL CLASSIFICATIONS SHEETS

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455	Job No.	Drill Hole No. A-1
Site Area Combe Fill South	Date 8-20-85	Elevation
Contractor	Sheet 1 of 1	SWL
Classified by TDN		Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
0			Strong brown coarse sandy loam; 30% coarse fragments.		0'	Horizon 1 Fill
1'			Dark brown coarse sandy loam; 50% coarse fragments.		1'	
1.5'					1.5'	Horizon 2 Fill No OVA Readings above background
2.0'			Dark yellowish-brown sandy clay loam; 50% coarse fragments; strong brown coarse sandy loam; 50% coarse fragments.		2.0'	
3.0'					3.0'	

302418

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill
Contractor
Classified by TDN

Job No.
Date 8-20-85
Sheet 1 of 1

Drill Hole No. A-2
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
0			Yellowish-brown silt loam; 15% coarse fragments.		0'	A Horizon
1.25'			Dark Yellowish-brown heavy silt loam; 15% coarse fragments.		1.25'	B Horizon No OVA readings above background
3.0'					3.0'	

302419

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8/21/85
Sheet 1 of 1

Drill Hole No. A-3
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
0			Yellowish brown silt loam; 5% coarse fragments.		0.5'	A Horizon
			Dark yellowish-brown heavy silt loam 5% coarse fragments			B Horizon No OVA readings above background
2			Strong brown heavy loam; 5% coarse fragments; few manganese coatings.		2.0'	
3.0'					3.0'	

302420

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455	Job No.	Drill Hole No. A-4
Site Area Combe Fill South	Date 8-21-85	Elevation
Contractor	Sheet 1 of 1	SWL
Classified by TDN		Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Yellowish brown silt loam; 15% coarse fragments.			Horizon 1 Fill
1.5'			Dark grayish-brown loam; 10% coarse fragments.		1.5'	Horizon 2 Fill
2.5'			White very moist unidentified material. Gray Ash		2.5'	
						No reading above background
6.0'			Pink, orange and yellow gritty material.		6.0'	

302421

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455 | Job No. | Drill Hole No. A-5
Site Area Combe Fill South | Date 8-21-85 | Elevation
Contractor | Sheet 1 of 1 | SWL
Classified by TDN | | Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Yellowish brown silt loam; 5% coarse fragments; dry.			A Horizon
1.0'					1.0'	
			Yellowsh-brown heavy silt loam; 5% coarse fragments			B Horizon
2.0'			Reddish-yellow silty clay loam; 5% coarse fragments; few manganese coatings.		2.0'	No readings above background
3.0'					3.0'	

302422

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-21-85
Sheet 1 of 1

Drill Hole No. A-6
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Dark brown silt loam; 5% coarse fragments.			A Horizon
1.0'			Yellowish-brown silt loam; 5% coarse fragments.		1.0'	B Horizon No readings above background
2.0'			Yellowish-brown heavy silt loam; common pale brown mottles; 5% coarse fragments.		2.0'	
2.5'					2.5'	

302423

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-21-85
Sheet 1 of 1

Drill Hole No. B-1
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown silt loam; 5% coarse fragments; dry.			A Horizon
1.0'			Dark yellowish-brown heavy silt loam; 20% coarse fragments.		1.0'	B Horizon No readings above background
			Dark yellowish-brown silty clay loam; 50% coarse fragments.		2.5'	

302424

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-22-85
Sheet 1 of 1

Drill Hole No. B-2
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown silt loam; 5% coarse fragments; dry.			A Horizon
0.5'			Dark yellowish-brown heavy silt loam; 5% coarse fragments.		0.5'	
			Dark yellowish-brown silty clay loam; 10% coarse fragments; moist.			B Horizon No HNU readings above background
3.0'					3.0'	

302425

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-22-85
Sheet of

Drill Hole No. B-3
Elevation
SWL
Core Diameter 5"

Depth	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown silt loam; 5% coarse fragments; dry.			A Horizon
.75'					0.75'	
			Dark yellowish-brown silty clay loam; 10-20% coarse fragments; moist.			B Horizon No HNU above background
					3.0'	

302426

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-22-85
Sheet of

Drill Hole No. B-4
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown silt loam; 5% coarse fragments; dry.			A Horizon
0.75'					0.75'	
			Strong brown heavy silt loam; 5-10% coarse fragments.			B Horizon No HNU readings above background
			Strong brown silty clay loam; 20% coarse fragments.			
3.0'					3.0'	

302427

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-22-85
Sheet 1 of 1

Drill Hole No. B-5
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Dark brown silt loam; 5% coarse fragments; dry.			A Horizon
1.0'			Dark yellowish-brown silty clay loam; 5-20% coarse fragmetns; moist.		1.0'	B Horizon No HNU readings above background
3.0'					3.0'	

F

302428

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-22-85
Sheet 1 of 1

Drill Hole No. B-6
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils: Range Size	Coarse Granular Soils: Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown silt loam; 10% coarse fragments; dry.			A Horizon
0.75'					0.75'	
			Strong brown heavy silt loam; 10% coarse fragments.			B Horizon
1.50'					1.50'	
			Strong brown silty clay loam; 20-30% coarse fragments.			No HNU readings above background
3.0'					3.0'	

302429

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-23-85
Sheet 1 of 1

Drill Hole No. C-1
Elevation
SWL
Core Diameter 5"

Depth ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown loam; 5-15% coarse fragments; dry.			A Horizon
					1.5'	
			Yellowsh-brown sandy loam; 15-30% coarse fragments; dry.			B Horizon No HNU readings above background
					2.75'	

302430

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-23-85
Sheet 1 of 1

Drill Hole No. C-2
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown sandy loam; 5% coarse fragments; moist.			A Horizon
0.5'					0.5'	
			Strong brown sandy loam; 15% coarse fragments; moist.			B Horizon No HNU readings above background
			Brownish-yellow loamy sand; 15-25% coarse fragments.			
3.0'					3.0'	

302431

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-23-85
Sheet 1 of 1

Drill Hole No. C-3
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown sandy loam; 5% coarse fragments; dry.			A Horizon
0.6'					0.6'	
			Brownish-yellow sandy loam; 15-20% coarse fragments; dry.			B Horizon No HNU readings above background
2.5'					2.5'	

F

302432

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-23-85
Sheet 1 of 1

Drill Hole No. C-4
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown sandy loam; 15% coarse fragments; dry.			A Horizon
0'					1.0'	
			Brownish-yellow sandy loam; 20-40% coarse fragments; dry.			B Horizon No HNU readings above background
75'					2.75'	

302433

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455 | Job No. | Drill Hole No. C-5
Site Area Combe Fill South | Date 8-23-85 | Elevation
Contractor | Sheet 1 of 1 | SWL
Classified by TDN | | Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown sandy loam; 5% coarse fragments.			A Horizon
					1.0'	
			Brownish-yellow loamy sand; 5% coarse fragments			B Horizon No HNU readings above background
					3.0'	

302434

R. E. WRIGHT ASSOCIATES, INC.

SOIL CLASSIFICATION SHEET

Project 8455
Site Area Combe Fill South
Contractor
Classified by TDN

Job No.
Date 8-23-85
Sheet 1 of 1

Drill Hole No. C-6
Elevation
SWL
Core Diameter 5"

Depth Ft.	Sample No.	In. Rec.	SOIL DESCRIPTION Density (or Consistency), Color Soil Type - Accessories	Coarse Granular Soils Range Size	Coarse Granular Soils Grain Shape	REMARKS Chemical Comp., Geologic Data, Ground Water, Construction Prob., etc.
			Brown loam; 10-20% coarse fragments.			A Horizon
.8'					1.8'	
			Brownish-yellow sandy loam; 30-40% coarse fragments.			B Horizon No HNU readings above background
.0'					3.0'	

302435

APPENDIX K

COMBE FILL SOUTH LANDFILL

REPORT ON ELECTROMAGNETIC SURVEY - AUGUST 1982

BY

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

NEW JERSEY STATE DEPARTMENT OF .VIRONMENTAL PROTECTION

TO Frank Markewicz, Acting State Geologist

FROM Robert Canace through Wayne Hutchinson and Haig F. Kasabach, Chief, Bureau of Ground Water Managment

DATE AUG 10 1982

SUBJECT Combe Landfill South, Chester, New Jersey — Terrain Conductivity Investigation

An electromagnetic terrain conductivity geophysical survey was conducted on the perimeter of Combe Landfill South, to attempt to delineate zones of possible ground water contamination. The survey was conducted partially on-site and partially off-site in order to develop comparative data and to investigate possible off-site migration of contaminants.

The terrain conductivity instrument can be used to help locate principal zones of ground water storage and movement in a bedrock aquifer, such as that below the above-referenced landfill. Additionally, zones of contaminated ground water can add to the instrument's resolution. In the survey, a 20 meter cable was utilized. Readings were taken in the horizontal and vertical mode (figures 1 and 2). Horizontal readings with a 20 meter cable are generally capable of detecting conductivity of the ground to a depth of approximately 15 meters (45 feet); the vertical mode is capable of detection to a depth of 30 meters (90 feet). Where a pattern indicating values of terrain conductivity higher than background values appear along a traverse line, there is an indication that such an area can be considered a likely zone of highly conductive ground water.

Elevated ground water conductivity is often a function of the presence of pollutants. In a bedrock aquifer, such as that surveyed, water occurs in select planes, such as joints, foliation and bedding planes. Elevated terrain conductivity readings in a bedrock aquifer indicate the location of water-bearing weathered zones. Other indicators are used to judge the quality of this ground water. For example, an increase in conductivity with depth can be an indication that water quality deteriorates with depth, because the normal relationship is a decrease in conductivity with depth. This relationship, wherein conductivity increased with depth, was encountered in two areas of the Combe Landfill South. The likelihood is high that ground water contamination exists in the rock aquifer at those points.

Conclusions

Based upon the results of the geophysical investigation, the following should be done to investigate ground water pollution at the Combe South Landfill:

1. Additional geophysical survey lines are needed; these can be performed by the Bureau.

2. Additional monitor wells are defintely required. Monitor wells are needed -

   a. north of the landfill, between the landfill and Schoolhouse Lane, adjacent to the utility right-of-way,

   b. in the southwest corner of the landfill,

   c. immediately west of the landfill, west of Trout Brook,

   c. adjacent to monitor well MW-4, drilled to a depth of approximately 50 feet.

302437

3. The existing monitor wells should be logged with a down-hole logging device. A caliper log and resistivity log can be performed by the Bureau.

Findings and Recommendations

The results of the conductivity investigation are summarized below. Readings are summarized in the attached tables and are contoured on figures 1 and 2. Recommendations are made for the location of additional monitor wells (Fig. 3).

Southwest Corner

Findings: An increase of terrain conductivity with increasing depth was noted on the immediate perimeter of the landfill. Since no leachate seeps were noted, there is evidence that the conductive water associated with leachate is present deep within the rock formation.

Recommendation: Install a monitor well in S.W. corner (Fig. 3 MW-SW) to investigate source of high ground conductivity at depth.

Northeast Corner

Findings: An increase in conductivity with increasing depth was noted between monitor well MW-4 and the power line. The likelihood that this increase is attributable to the presence of 100 feet of steel casing in the ground at MW-4 is negated by the fact that readings immediately east of MW-4, at a distance from the equivalent to the distance at which high readings were observed, are half (4-5 m.mho/m) of the elevated readings (9-10 m.mho/m). It is likely that the narrow zone of elevated conductivity values, as indicated in red contours in figure 2, is due to highly conductive ground water.

Recommendations:

a. Install a monitor well (MW-N) approximately 1000 feet and north of the landfill approximately 200 feet east of the high tension line (MW-N, fig. 3) to monitor ground water flow between the landfill and Schoolhouse Lane.

b. Log existing well MW-4 using the Bureau's logger. A resistivity and caliper log should be performed in the open hole below the 100 feet of casing.

c. Install a shallow (50 feet) 2" piezometer (MW-4A) adjacent to monitor well MW-4, for the purpose of determining the vertical variation in pressure head within the rock aquifer; alternately, this shallow piezometer could be located adjacent to proposed monitor well MW-N.

Eastern Perimeter

Findings: Values for terrain conductivity are generally low. This area corresponds with the Alaskite zone, as mapped by Mark Germane

AUG 10 1982

of the State Geological Survey, low background values would be expected. Existing monitor wells 2 and 1 appear to be adequately located to monitor the ground water in this area.

Recommendations: a. Perform additional geophysical surveys in the northeast corner; this can be accomplished by the Bureau.

b. Log monitor well MW-2 with the resistivity and caliper log to determine the depth of casing and characteristics of the rock aquifer.

Southeastern Corner

Findings: Deep readings could not be obtained along lines B, C, and D (Figure 2). This is an indication that the rock formation lacks significant permeability with depth, but does not preclude the presence of leachate. Shallow terrain conductivity readings indicate a potential zone of investigation in the vicinity of monitor well MW-5. Well MW-5 appears to be adequately located to monitor the ground water in this area.

Western Perimeter

Findings: Elevated readings of terrain conductivity were noted in the area west of Trout Brook. Elevated readings from the horizontal mode may be attributable to the presence of clay soils and poorly-drained terrain. The pattern of the conductivity contours, though, does not correspond to ground patterns of moisture that were obvious in the field. The pattern noted is a possible indication or reflection of weathered zones in the rock aquifer.

Recommendations: A precautionary monitor well should be installed in the cleared area west of Trout Brook. The purpose of this well would be to monitor for under flow in the rock aquifer below Trout Brook, toward Tanners Brook. The proposed location of the proposed monitor well is at MW-W (Fig. 3).

Northwest Corner

Findings: Decreased conductivity with depth was noted in this area.

Recommendations: A monitor well should be installed in the northwest corner as a background well and to aid in determining the direction of regional ground water flow and background water quality. The proposed location is MW-NW, (Figure 3).

WQM30:clb

Attachments

cc: Arnold Schiffman, Director

302439

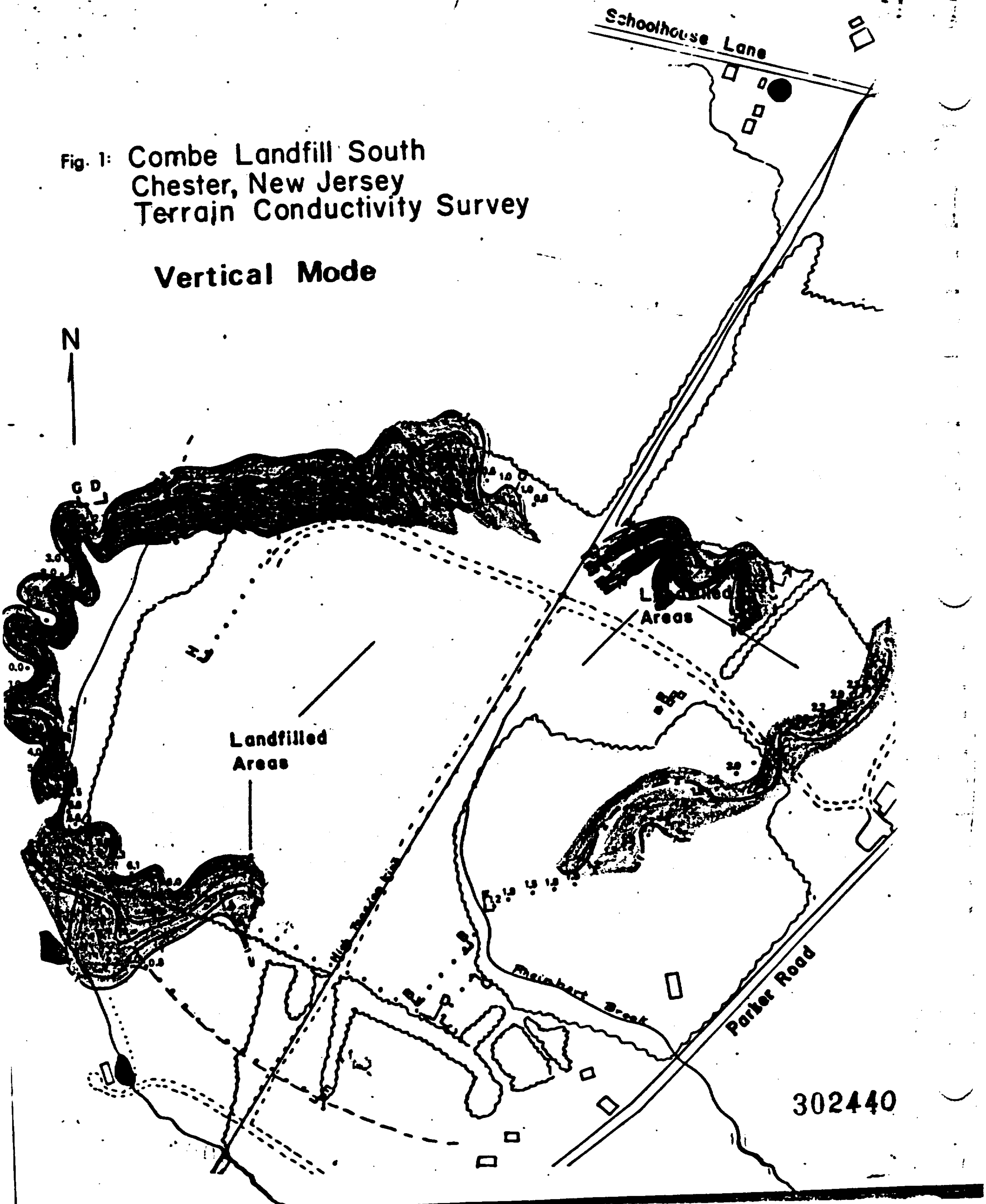
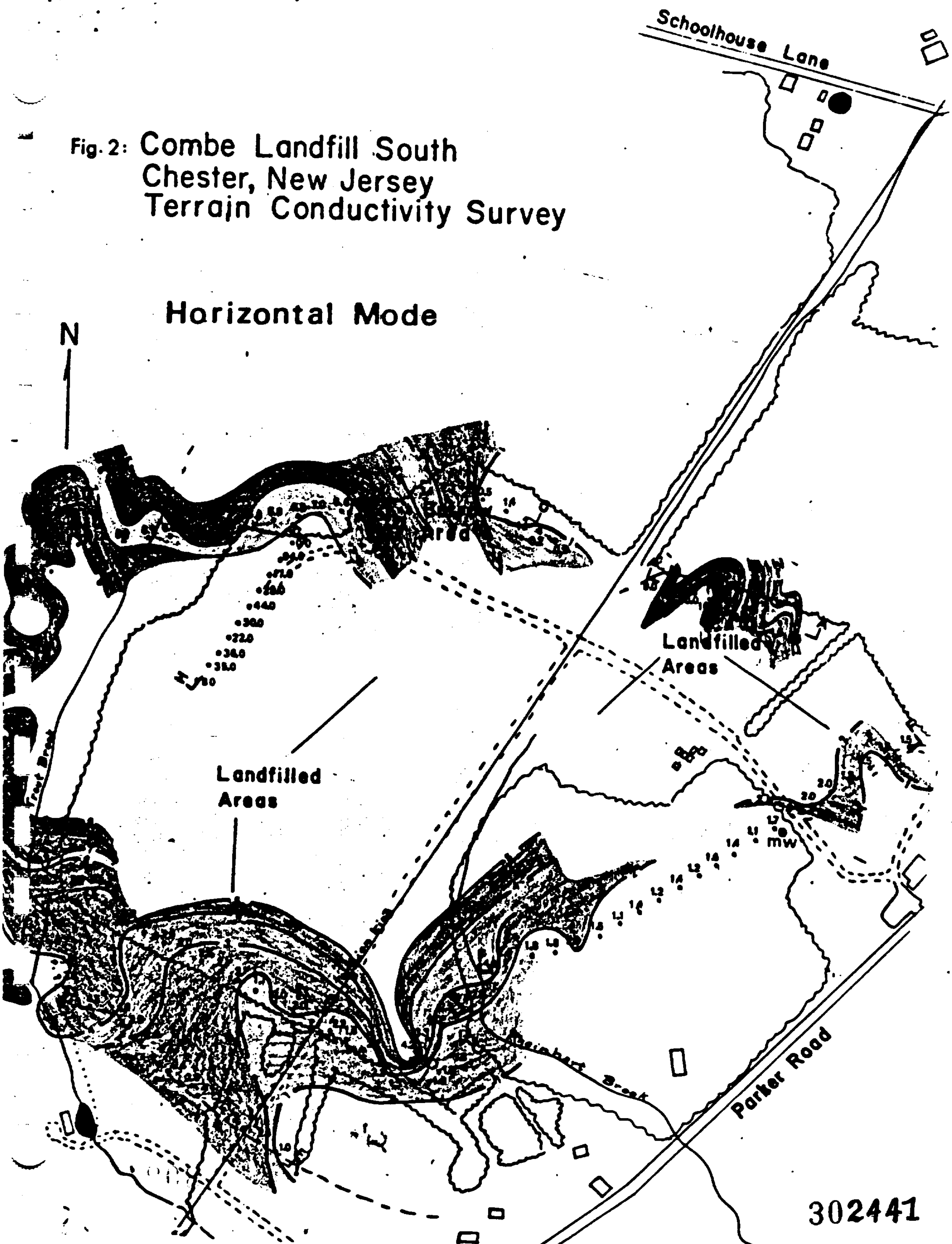


Fig. 1: Combe Landfill South
Chester, New Jersey
Terrain Conductivity Survey

302440

Fig. 2: Combe Landfill South
Chester, New Jersey
Terrain Conductivity Survey

Horizontal Mode



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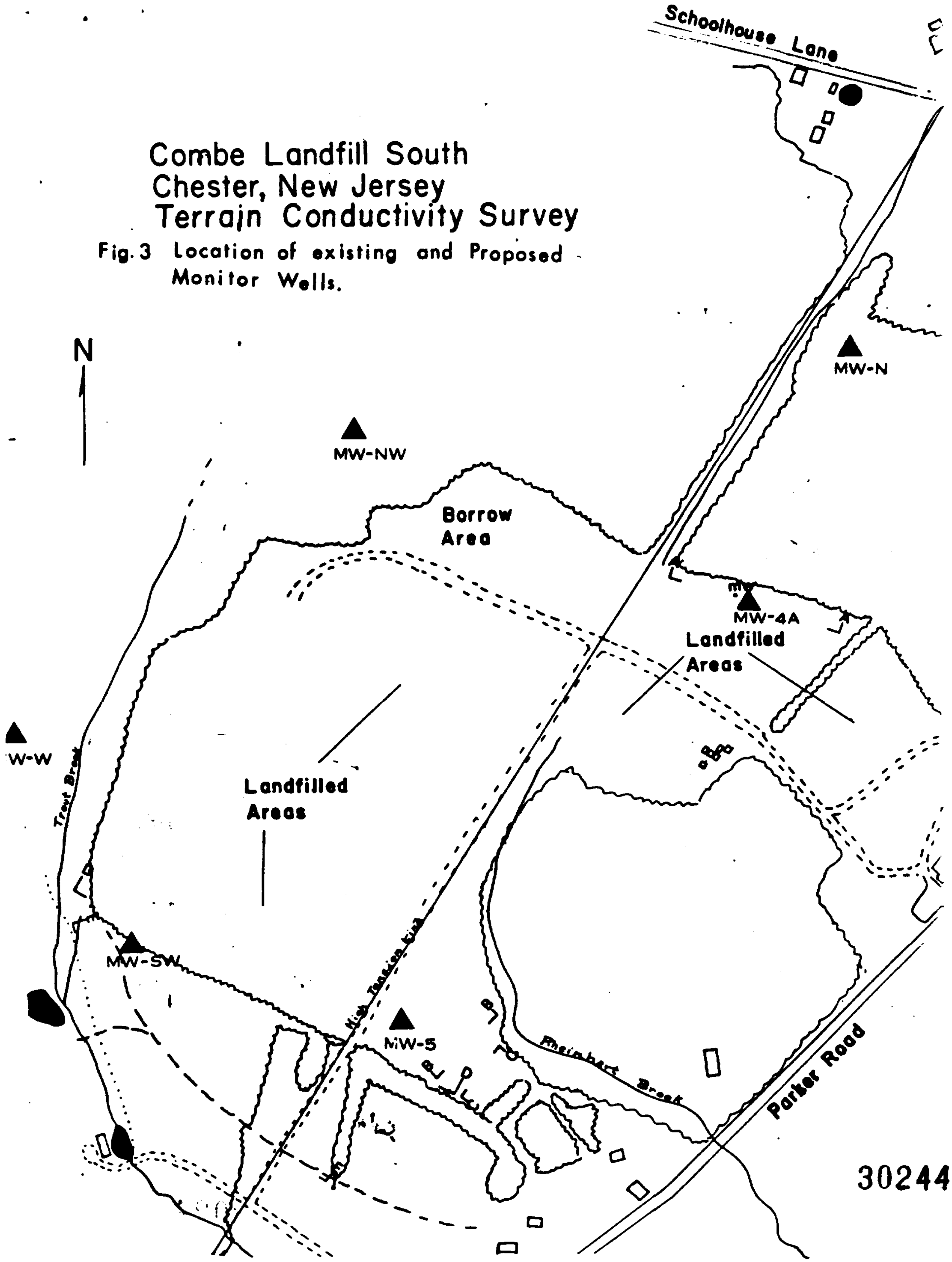
Combe Landfill South
Chester, New Jersey
Terrain Conductivity Survey

Fig. 3 Location of existing and Proposed Monitor Wells.



302442

APPENDIX L

REPORT TO CHESTER AND WASHINGTON TOWNSHIPS

ON THE RESULTS OF THE WATER QUALITY TESTING PROGRAM

AT THE COMBE FILL LANDFILL

BY

UPPER RARITAN WATERSHED ASSOCIATION

MAY 24, 1981

UPPER RARITAN
WATERSHED ASSOCIATION
LARGER CROSS ROAD, RD1 BOX 30-W, GLADSTONE, N.J. 07934
(201) 234-1852

RETURN TO DAVE PEIFER

REPORT TO CHESTER AND WASHINGTON TOWNSHIPS ON THE RESULTS OF THE WATER QUALITY TESTING PROGRAM AT THE COMBE FILL LANDFILL.

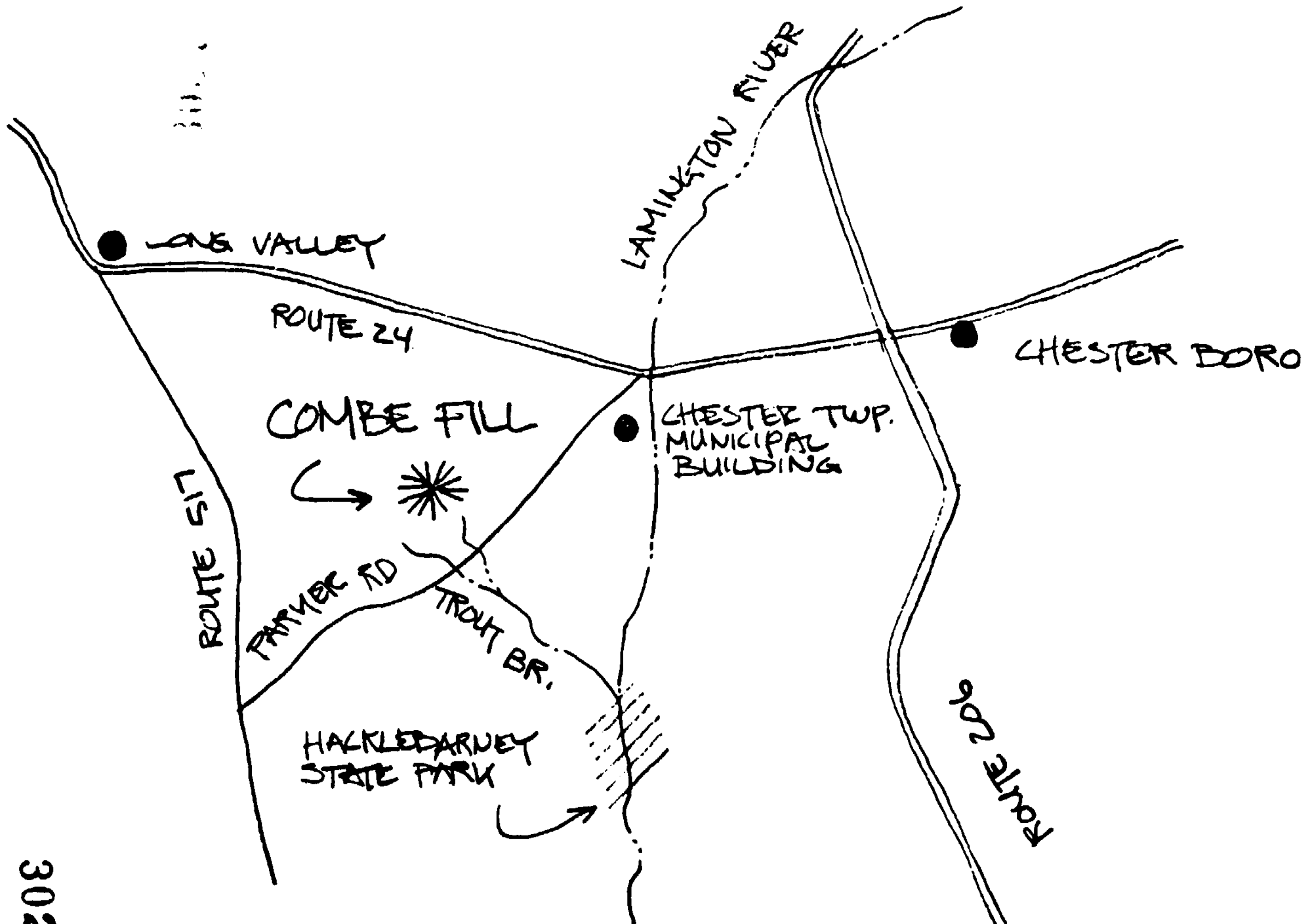
Darryl F. Caputo
Executive Director

May 24, 1981

302444

FIGURE 1:

COMBE FILL: LOCATION



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LIST of FIGURES

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ABSTRACT

This report summarizes the results of the water quality testing program at the Combe Fill Landfill located in Chester and Washington Townships, Morris County. The testing program, a joint undertaking by both T nships, the State Department of Environmental Protection and the Upper Raritan Watershed, was designed to determine if the landfill posed an existing or potential health hazard to adjacent residents who rely on surface and ground water as a drinking supply source. Surface, shallow subsurface and deep ground waters were tested for a broad range of possible contaminants consistant with State and Federally approved collection and analysis techniques.

Typical water quality characteristics indicated probable chemical contamination. Concentrations of lead and maganese were found to exceed state standards. Twenty-three identifiable and 10 unknown organic chemicals were discovered in varying concentrations from 1 ppb to 338 ppb. While the results are not indicative of "gross" contamination they are, nevertheless, significant. The results indicate the presence of substances at the landfill which should not be there, that there is "significant" contamination of surface, shallow subsurface and deep ground waters and that the contamination is migrating from the landfill.

In view of these results, it is strongly recommended that residential wells along Parker Road in the vicinity of the landfill be tested consistant with procedures followed in this program. If contamination of residential wells is discovered, there can be no doubt that the landfill constitutes a public health hazard.

COMBE FILL: DESCRIPTION and HISTORY

DESCRIPTION:

The landfill, presently named Combe Fill South, has been in existence for approximately 30-35 years and is located on Parker Road in Chester and Washington Townships, Morris County, approximately one mile west of the Chester Township Municipal Building (Figure 1). Approximately two thirds of the property lies in Washington Township with the remainder located in Chester Township. The 197-acre tract constitutes the headwaters of Trout Brook and is drained by two small tributaries; the east branch and west branch.[1] Along the west branch, on the landfill property, is an approximate 50-acre hardwood wetland which has been the subject of recent litigation. Trout Brook, classified by the State DEP as "trout production waters," the highest classification which can be given to fresh water streams, flows southeast where it joins with the Lamington River at Hacklebarney State Park. The Lamington meets the North Branch of the Raritan River which drains into the Raritan River in Somerset County near Branchburg. At Bound Brook, the Elizabethtown Water Company withdraws water from the river to supply over a million residents throughout central and northeast New Jersey. This understanding has lead to the aforementioned wetland being designated as an "environmentally critical area" by several experts and governmental agencies.[2] A small tributary of Tanners Brook, which also flows into the Lamington River, drains the western most portion of the property.

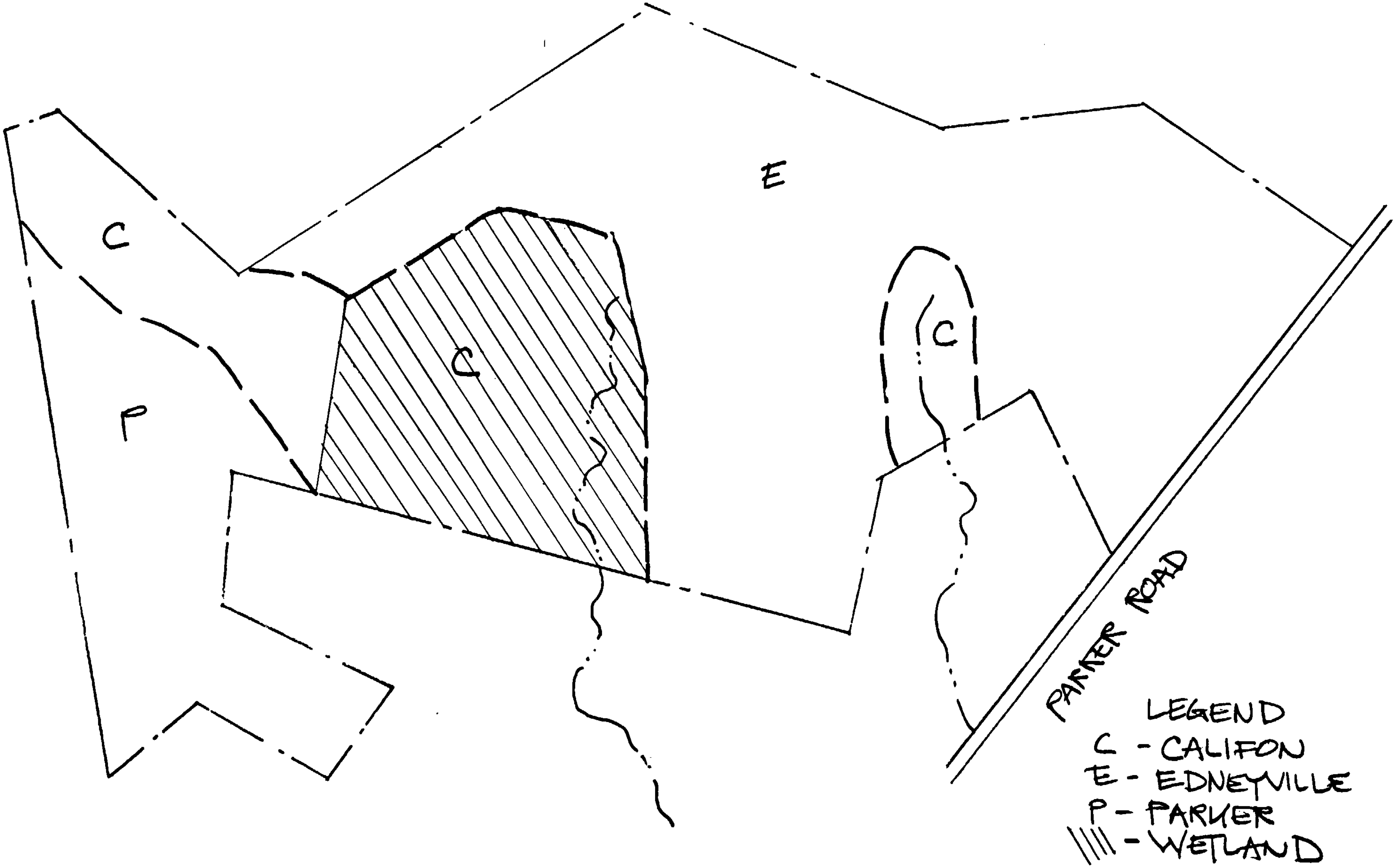
The landfill, and much of the region, is underlain by granitic gneiss; a hard, dense rock with an extremely complicated fracture pattern. The formation trends northeast and dips steeply to the southeast. Fractures occur generally vertical or transverse to the dip and with a highly variable distribution[3]

Soils consist primarily of the Califon, Parker and Edneyville Series as identified by the Morris County Soil Conservation Service[4] Figure 2 approximates the location of the soil series on the landfill property. The Edneyville Series consists of deep, well-drained loomy soils occurring at the center of the property; the area presently being filled. Califon soils are deep, moderately well to poorly drained soils occurring in water ways or seepage areas, and have a fragipan beginning at a depth of nine inches. These soils generally underlie the wetland area. Parker soils are deep, excessively drained and contain large amounts of stones, gravel and cobbles. They occur on the higher, unused portion of the property.

Surface and ground water flows are generally portrayed in Figure 3. Surface drainage occurs from the ridges toward the branches of Trout Brook and southeasterly across Parker Road. Although bedrock fractures are quite complex, it can generally be stated that ground water flows approximate surface flow directions; again in a southeasterly direction. This does not rule out other possible directions, however, it does indicate probable flows.

FIGURE: 2

COMBE FILL: SOIL DISTRIBUTION

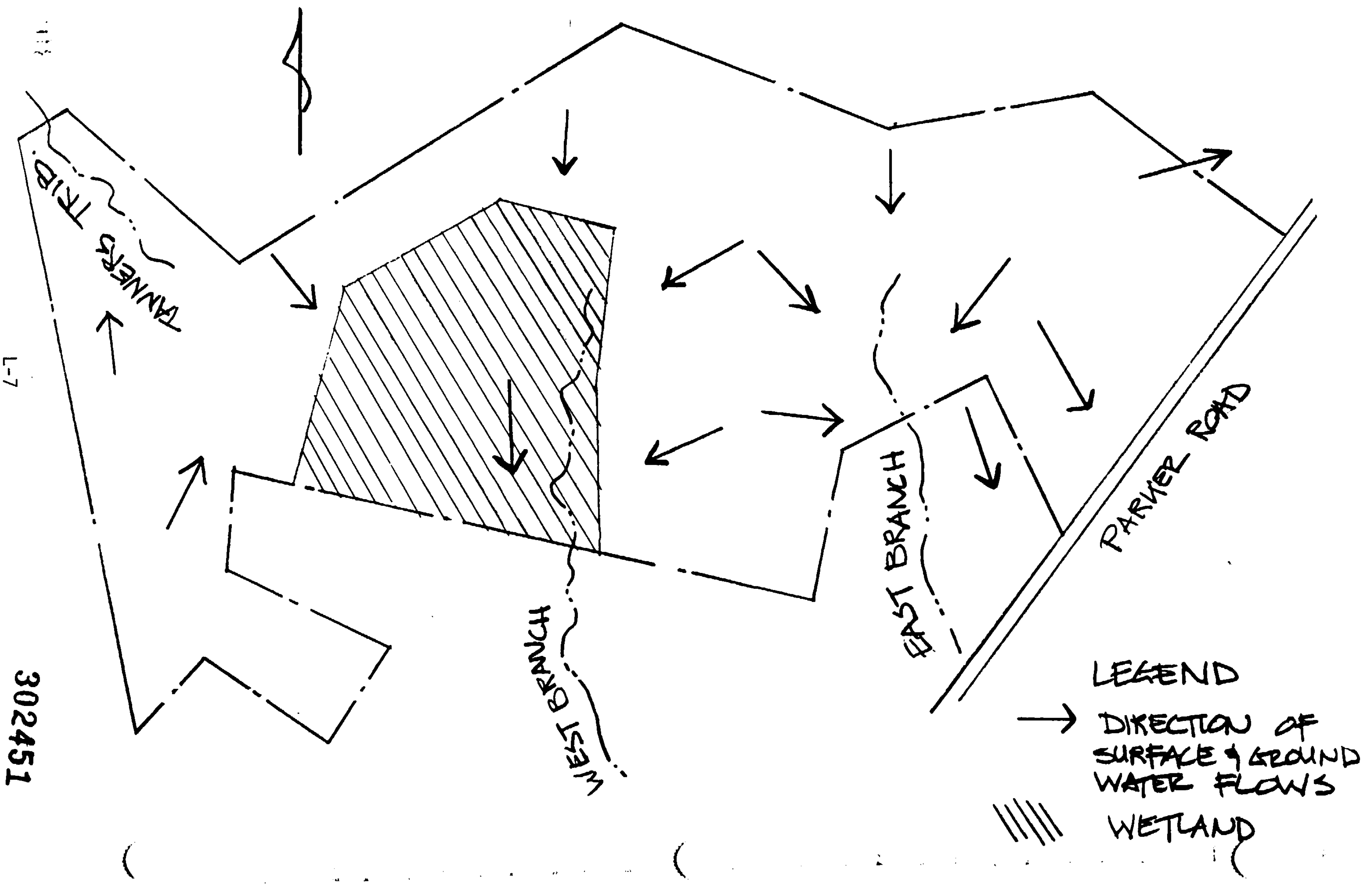


L-6

302450

FIGURE 3:

COMBE FILL: WATER CHARACTERISTICS



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HISTORY:

Filling has occurred at the site for the past 30-35 years. It must be recognized that for at least 20 years filling was allowed to occur with little governmental control over either contents or procedures. In 1971, Filliberto Sanitation, Inc. applied, pursuant to recently enacted state law, to the newly formed State DEP Bureau of solid Waste Management for a permit to continue operations at the site. In early 1972, a permit was given which allowed for, among others, the acceptance of industrial and municipal (residential) waste. Shortly after, in response to complaints by local residents and officials and the State Bureau of Fisheries Management, the owner was ordered to install several monitoring wells on the property to monitor potential ground water pollution. Visits by State DEP officials documented visible pollution originating from the landfill.[5] In 1978, a change of corporate ownership certificate was issued by the State DEP Solid Waste Administration to Combe Fill, Inc. to reflect change in ownership of the property. The certificate transferred the previous granted permit to the new owners. A fire which occurred about two years ago at the property again drew attention of concerned residents, local and state officials. Continuing investigations by DEP officials pointed out existing and potential pollution problems at the landfill.[6]

With the closing of the Mt. Olive Landfill (Combe Fill North) in January 1981, the volume dumped at Combe Fill South increased by approximately 70-75 percent.[7] In response to the clearing of a portion of the wetland area, Chester and Washington Townships successfully obtained a court injunction against the landfill which prevented clearing or filling of that area and which required the submission of new engineering designs.[8] Subsequently, the DEP Solid Waste Administration issued "An Order Modifying Registration" requiring the submission of such designs.[9] The landfill owners have requested an administrative hearing on that order. During this time, the U.S. Environmental Protection Agency, acting under Section 404e of the "Clear Water Act of 1977," issued to the landfill a cease and desist order against further activity in the wetland and ordering the landfill to submit an application to the Corps of Engineers for the required permit.[10] Also, the DEP Division of Water Resources informed the landfill that a dewatering permit for draining the wetland was required prior to any disruption of the area.[11]

In September of 1980, the Solid Waste Administration issued a Certificate of Approval of the Morris County District Solid Waste Management Plan in which the Morris County Freeholders were ordered to establish a new landfill site and have it in operation by January 31, 1982.[12]

Financial statements of both Combe Fill and Combustion Equipment Associates, Inc. (the parent company) show that both are financially unstable.[13] Indeed, the parent company has filed a bankruptcy proceeding in New York. Figure 4 portrays the present fill status of the landfill.

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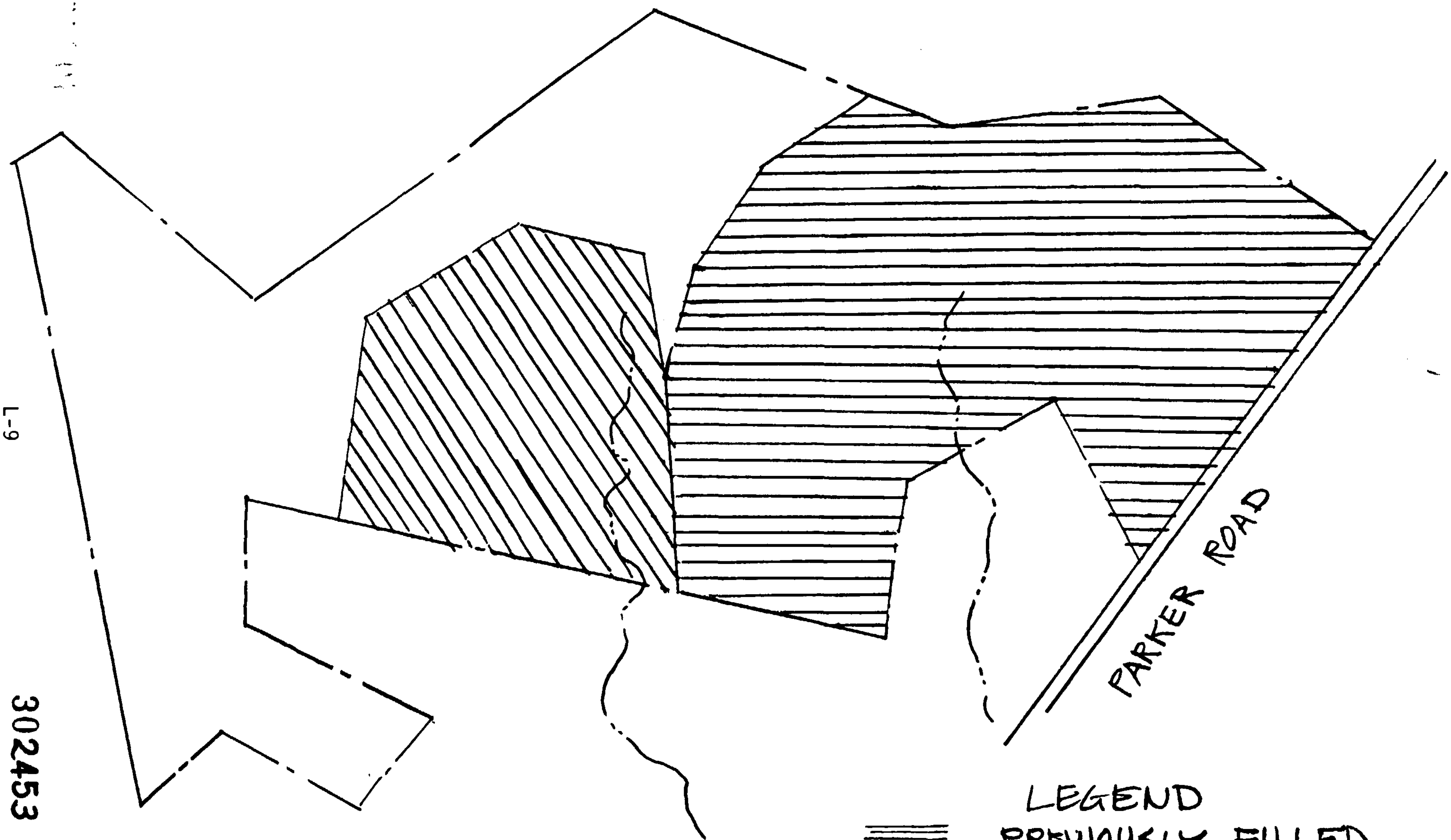
FIGURE 4:

COMBE FILL: FILL STATUS



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302453

WATER QUALITY TESTING PROGRAM:

BACKGROUND:

Over the past ten years or so water quality at and adjacent to the landfill has been monitored. Results have shown elevated levels, at one time or another, of mercury, lead, phenols and arsenic.[14]

In response to growing public concerns URWA, in cooperation with the DEP Division of Water Resources and Solid Waste Administration, formulated a program for testing water quality at the landfill.[15] This program was designed to determine whether or not the landfill was a pollution threat to surface and/or groundwaters and, if so, to determine if contamination was moving beyond the boundries of the property. A consultant, Allied Biological Control Corporation of Gladstone, was chosen to collect the samples and Princeton Testing Laboratory was chosen to conduct the actual tests. Samples were collected following accepted State and Federal sampling procedures. The laboratory is a state certified testing facility.

SITE LOCATIONS:

Sample stations were carefully chosen to intercept surface and groundwater flows on and migrating from the site. Figure 5 portrays the locations of both URWA's and DEP's stations. Seven surface sample sites were chosen: one URWA and one DEP site at the headwaters of the east branch of Trout Brook on the landfill property and one URWA site on the same watercourse off the property; a URWA site at the headwaters of the western branch of Trout Brook on the property; a DEP and URWA site at a seep which flows into the waterway again still on the property; a URWA site on the same watercourse but off the property. The DEP sampled the deep monitoring well number 4 located on the older filled portion of the property and a deep monitoring well number 5 on the Filliberto property adjacent to the landfill. URWA constructed five shallow monitoring wells, 25± feet deep, and sampled two: one just off the southern boundary of the landfill on property owned by the Tingue and the other at the east property line separating the landfill from the Filliberto's property. Shallow wells were contructed by digging with a backhoe and installing a two-inch diameter pipe inside a six-inch diameter pipe with coarse, clean sand between the two. URWA samples were collected on March 23 and March 31, 1981. DEP samples were collected approximately two weeks earlier. A deep groundwater control well located a considerable distance from the landfill was also tested.

TEST PARAMETERS:

A list of water quality parameters included in the testing program was developed in conjunction with DEP chemists, engineers and geologists. The parameters were chosen based on their known occurrences in other similar landfills. Figure 6 identifies the test parameters.

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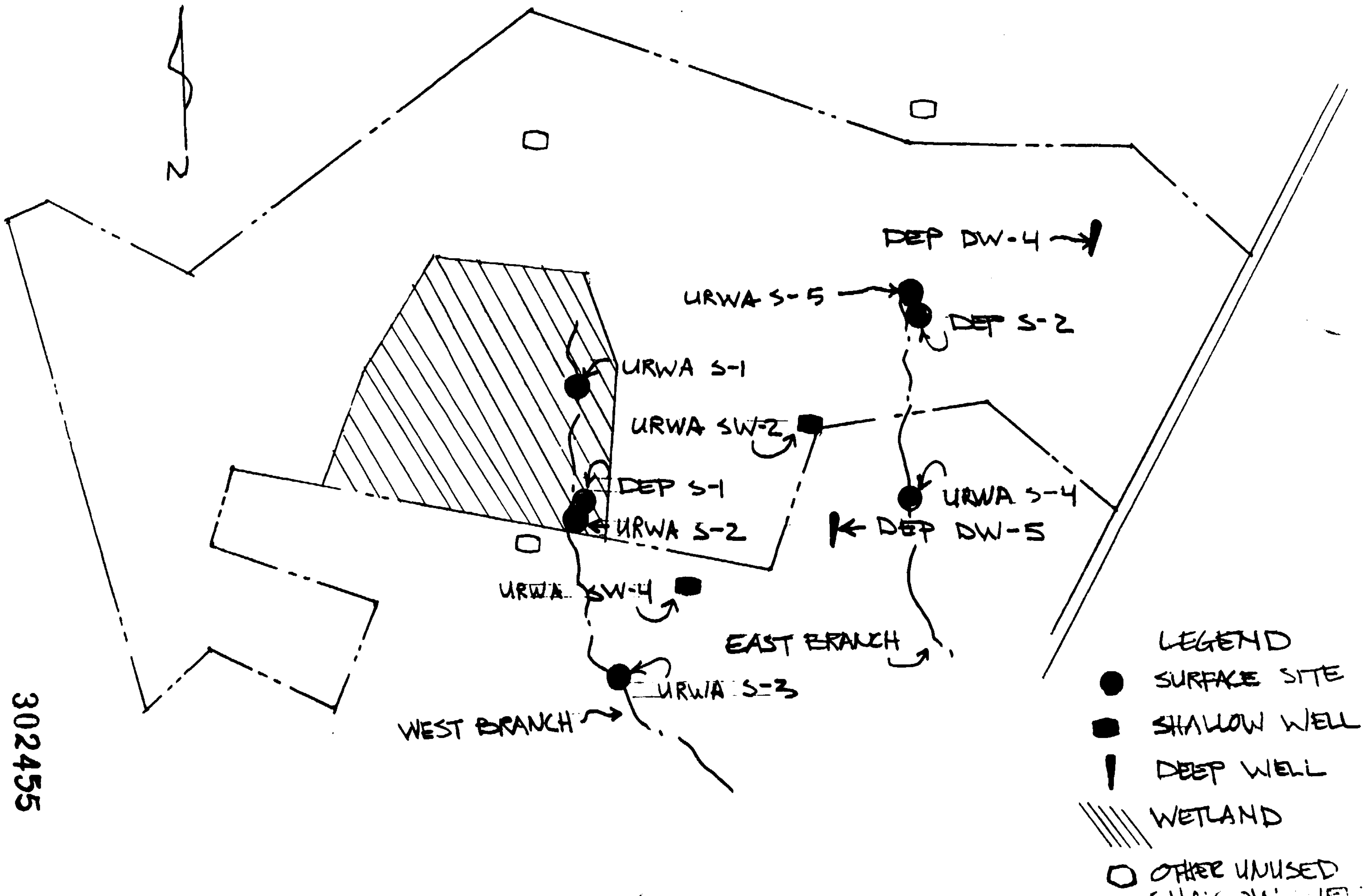
FIGURE 5

COMBE FILL: WATER QUALITY TEST SITES



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302455

Figure 6; Combe Fill: Parameters

BOD	Chloride
COD	Total Coliform
TOC	Fecal Streptococci
Total Kjeldahl Nitrogen	Total Hardness
Nitrate	
Total Dissolved Solids	

RADIOACTIVITY

Gross Alpha	Gross Beta

METALS

Arsenic	Mercury
Cadmium	Chromium
Lead	Cyanide
Manganese	Phenols

ORGANIC CHEMICALS

Volatile Organics

Chloromethane	Bromomethane
Vinyl Chloride	Chloroethane
Methylene Chloride	Trechloroflurومethane
1,1 Dichloroethene	1,1 Dichloroethane
Trans-1,2 Dichloroethane	Chloroform
Carbon Tetrachloride	Bromodichloromethane
1,2 Dichloropropene	Trans-1,3 Dichloropropene
Trichloroethene	Dibromochloromethane
bis-1,3 Dichloropropene	1,1,2-Trichloroethane
Benzene	Toluene
2-Chloroethylvinyl ether	Bromoform
Tetrachloroethene	1,1,2,2-Tetlachloroethane
Chlorobenzene	Ethylbenzene
Arolein	Acrylonitrile

PESTICIDES and PCB's

Aldrin	BHC Gamma
BHC, Alpha	DHC Delta
BHC, Beta	4,4' DDT
Chlordane	4,4' DDE
4,4' DDD	Endosulfan-alpha
Dieldrin	Endosulfan-beta
Endosulfan Sulfate	Endrin
Endrin Aldehyde	Heptachlor

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Heptachlor epoxide
PCB-1242
PCB-1232
PCB-1260
Toxaphene
PCB-1254
PCB-1221
PCB-1248
PCB-1016

ACID EXTRACTS

2-Chlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
4-Nitrophenol
Pentachlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
4,6-Dinitro-o-cresol
2-Nitrophenol
P-chloro-m-cresol
Phenol

BASE/NEUTRAL EXTRACTS

Acenaphthene
Acenaphthylene
Anthracene
Benzidene
Benzo (a) anthracene
bis(2-chloroethyl) ether
4-bromophenyl phenyl ether
2-Chloronaphthalene
Chrysene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
Diethyl phthalate
Di-n-butyl phthalate
2,6-Dinitrotoluene
1,2-diphenylhydrazine (also azobenzene)
Fluorene
Hexachlorobutadiene
Hexachloroethane
Isophorone
Nitrobenzene
N-nitrosodi-n-propylamine
N-nitrosodiphenylamini
1,2,4-Trichlorobenzene
Benzo (a) Pyrene
3,4-Benzofluoranthene
Benzo (ghi) perylene
Benzo (k) Fluroranthene
bis(2-chloroethoxy) methane
bis (2-ethylhexyl) phthalate
Butylbenzyl phthalate
4-Chlorophenyl phenyl ether
Dibenzo(a,h) anthracene
1,3-Dichlorobenzene
3,3'-Dichlorobenzidine
Dimethyl phthalate
2,4-Dinitrotoluene
Di-n-octyl phthalate
Fluorathene
Hexachlorobenzene
Hexchlorocyclopentadiene
Ideno(1,2,3-cd) pyrene
Naphthalene
N-nitrosodimethylamini
Pyrene
Phenanthiene

TEST RESULTS

Metals: Typical water quality characteristics showed elevated levels of total dissolved solids, total coliform, nitrate and hardness. Results for heavy metals were generally at or below standards with two noticeable exceptions. At station URWA S-3 lead was found at a concentration of 0.13 parts per million (ppm) or about 2 1/2 times the 0.05 ppm standard for potable drinking water. Manganese was found exceeding the 0.05 ppm potable water standard at all URWA stations except URWA SW-4. Figure 7 presents the test results for manganese. URWA's control well produced results for all parameters at or below standards.

302457

Figure 7: Combe Fill: Water Quality Test Results for Manganese

Station	Concentration Found ppm	Standard ppm	Times Exceeding the Standard
URWA S-1	4.98	.05	99.7 X
URWA S-2	.27	"	5.4 X
URWA S-3	.44	"	8.8 X
URWA S-4	1.2	"	24 X
URWA S-5	1.35	"	27 X
URWA SW-2	9.4	"	188 X
URWA SW-4	.02	"	Below
CONTROL WELL	.02	"	Below

Organic Chemicals: Organic chemicals were found in all DEP stations and all but one URWA station which was URWA S-1. No organic chemicals were found at URWA's control well. Figure 8 provides total organic chemical results for each station.

Figure 8: Combe Fill: Water Quality Test Results for Total Organic Chemical Concentration.

Station	Concentration Found (ppb) parts per billion
URWA S-1	0
URWA S-2	1005
URWA S-3	54
URWA S-4	131
URWA S-5	122
URWA SW-2	80
URWA SW-4	43
URWA Control Well	0
DEP @-1	155
DEP S-2	616
DEP DW-4	762
DEP DW-5	150

Eight unknown volatile organic compounds were found at site URWA S-2; 2 with concentrations of 200 ppb and 6 with concentrations of 10 to 20 ppb. Two unknown volatile organic compounds with concentrations of 10 to 20 ppb were found at site URWA S-3.

Concentrations of organic compounds found ranged from 1 ppb to 338 ppb. In total 33 organic chemicals were discovered five of which are known carcinogens. Eight compounds were found in individual concentrations equal to or exceeding 100 ppb. Figure 9 lists all organic chemicals found and indicates the highest concentrations of each one.

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Figure 9: Combe Fill: Highest Concentrations of Found Organic Chemicals

Name	Sample Site	Concentration (ppb)
Heptane	DEP DW-4	256
Carbontetrachloride	DEP DW-4	338
Nonane	DEP S-2	252
Benzene	URWA S-4	11
Toluene	URWA SW-2	13
M,P, Xylene	DEP S-2	19
O, Xylene	DEP S-2	22
Propy. Benzene	DEP S-2	11
Dibromochloromethane	DEP S-2	78
1,4 Dichlorolue*ane	DEP S-2	20
1,2 Dichloroethane	URWA SW-4	22
Trichloroethylene	DEP DW-4	46
Tetrachloroethylene	DEP DW-4	100
1,1 Dichloroethane	URWA S-2	160
Tetrachloroethene	URWA SW-6	6
Methylene Chloride	URWA S-2	280
Trans 1,2 Dichloroethene	URWA S-4	120
Ehtyl Benzene	URWA SW-2	10
1,4 Dichlorobenzene	DEP S-1	9
Diethyl Phthalate	URWA S-2	54
Bis(2-ethylhexyl) Phthalate	URWA S-5	90
Naphthalene	URWA S-2	10
Endosulfan-alpha	URWA S-2	1

Carbontetrachloride was the most common chemical found and showed up in concentrations exceeding 100 ppb in all DEP sites. Heptane also appeared in all DEP sites. The most prevelant chemicals found in URWA sites were 1,1-Dichloroethane and Trans-1,2-Dichlorethene which were each found in 3 out of 7 sample locations at the landfill. With the exception of URWA S-1 more than one organic compound was found in each sample site. Figure 10 lists the total number of organic chemicals for each test site.

Figure 10: Combe Fill: Total Number of Organic Chemicals Found at Each Test Site

Site Location	Number of Organic Chemicals Found
URWA S-1	0
URWA S-2	12
URWA S-3	4
URWA S-4	2
URWA S-5	3
URWA SW-2	4
URWA SW-4	4
URWA Control Well	0
DEP S-1	3
DEP S-2	10
DEP DW-2	6
DEP DW-5	3

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Standards for specific organic chemical contamination of surface water, groundwater or potable drinking water do not exist. In recognition of the fact that chlorine can react with naturally occurring substances to produce carcinogenic compounds, the U.S. Environmental Protection Agency has adopted a maximum contaminant level of 100 ppb (parts per billion) of trihalomethanes in drinking water from community water systems serving 10,000 or more persons.[16] Trihalomethanes are one of the family of organic compounds named as derivatives of methane wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure. The N.J. Department of Environmental Protection, Division of Water Resources, Bureau of Ground Water Management recommends closure of groundwater wells serving individual residences when total concentrations of organic chemicals included in the EPA pollution priority list equal or exceed 100 ppb.[17] It must be recognized that the absence of specific standards for specific organic compounds does not imply that these substances are safe. The lack of standards is due to the newness of the field, a lack of adequate scientific research and the length of time for promulgating the standards. Even though no specific standards exist for the specific organic chemicals in the EPA priority pollutant list, many are known or suspected to be toxic, carcinogenic, mutagenic or teratogenic. Also it is now accepted in the scientific literature that no safe threshold exists for a carcinogenic substance. In the absence of specific standards, the 100 ppb of total organic chemical contamination can be considered to be a reasonable threshold. <u>It should be noted that the total organic chemical concentration exceeded 100 ppb in seven of the eleven test sites.</u>

The U.S.EPA has published estimates of cancer risk of various known carcinogens.[18] These estimates are based on extrapolations from laboratory animal data and are given in terms of the concentration of a substance which, if ingested in the given amounts over a life time, would cause one incidence of cancer in a population of 100,000 (10^{-5}), 1,000,000 (10^{-6}) or 10,000,000 (10^{-7}). Figure 11 identifies health criteria for those carcinogenic chemicals found at Combe Fill. In all five cases, concentrations found at the landfill greatly exceed EPA's health criteria. For carbon tetrachloride the found concentration of 338 ppb exceeded the health criteria by 800 times.

Figure 11: Health Criteria for Carcinogenic Substances at Combe Fill

Compound	Health Criteria	Concentration Found	Times Above Criteria
Carbon Tetrachloride	.42 ppb	338 ppb	800 X
Benzene	.67 ppb	11 ppb	16 X
1,2 Dichloroethane	.94 ppb	22 ppb	33 X
Trichloroethylene	2.79 ppb	46 ppb	17 X
Tetrachloroethylene	.88 ppb	100 ppb	112 X

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DESCRIPTIONS, HEALTH EFFECTS AND TOXICITY OF SELECTED SUBSTANCES FOUND AT COMBE FILL

Below is a listing of selected organic chemicals and metals with a brief description of each and an identification of adverse health effects resulting from acute dosages. This information is taken from the current literature.[19]

ORGANIC CHEMICALS

Carbon Tetrachloride - a nonflammable colorless liquid used in fire extinguisher and as a solvent for fats and greases in cleaning solutions. Carbon tetrachloride has been linked with liver cancer and is classed by the USEPA as a carcinogen.
Exposure may result in central nervous system depression and gastrointestinal symptoms of liver and kidney damage. Nausea, vomiting, abdominal pain, diarrhea, enlarged and tender liver and jaundice result from liver damage. Diminished urinary volume, red and white blood cells in the urine, albuminuria, coma and death may result from acute kidney failure. Systemic effects worsen when used in conjunction with ingestion of alcohol.

Heptane - is a paraffin contained in light petroleum products. Irritates skin, lung and nerves.

Nonane - is also a paraffin in a liquid form, used as a solvent and irritates skin, lungs and nerves.

Benzene - is an extremely inflammable colorless liquid obtained by the fractional distillation of coal tars. It is used as a solvent for fats and in the making of lacquers, varnishes, many dyes and other organic compounds. Benzene is classed as a carcinogen by the USEPA. Benzene may also cause prolonged menstrual bleeding in humans.

Toluene - is a colorless liquid hydrocarbon generally obtained from coal tars used in making dyes, explosives and saccharin. Toluene is volatile and may be absorbed through the skin, digestive tract or by breathing. Acute exposure results predominantly in central nervous system depression. Symptoms include headache, dizziness, fatigue, muscular weakness, drowsiness, incoordination with staggering gait, skin paresthesias, collapse and coma. Toluene is also associated with adverse reproductive effects in humans and may cause prolonged menstrual bleeding.

Xylene - is a liquid resembling toluene obtained from coal tar and used in dyes and as a solvent. Xylene is known to be a central nervous system depressant and to irritate the lungs.

1,2-Dichloroethane or Ethylene Dichloride - is an oily toxic liquid used as a solvent and in the manufacture of polyvinyl chloride. Dichloroethane effects the ner-

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vous system, respiratory system, heart and liver. Inhalation may cause nausea, vomiting, mental confusion, dizziness and pulmonary edema. Chronic exposure has been associated with liver and kidney damage. There is risk to nursing infants and it is listed as a carcinogen.

Trichloroethylene
or
TCE - is a colorless liquid widely used as an industrial solvent in dry cleaning and as an anesthetic. It is a central nervous system depressant with such symptoms as headache, dizziness, vertigo, tremors, nausea and vomiting, irregular heart beat, sleepiness, fatigue, blurred vision and intoxication similar to that from alcohol. Unconsciousness and death have been reported. Alcohol may worsen the symptoms and the person may become flushed. Addiction and peripheral neuropathy have been reported. It is a known carcinogen.

Tetrachloroethylene
(Perchlorethylene) - is a colorless non-flammable liquid used in dry cleaning. Acute exposure may cause nervous system depression, hepatic injury and anesthetic death. In animals it produces cardiac arrhythmias and renal injury. Symptoms of exposure include malaise, dizziness, headache, increased perspiration, fatigue, staggering gait and slowing of mental ability. It is a known carcinogen.

Methylane
Chloride - (Dichloromethane) is a colorless volatile liquid used as a solvent refrigerant and anesthetic. It effects the central nervous system, causes heart fibrillation and symptoms similar to carbon monoxide poisoning.

Naphthalene - is one of the principal constituents of coal tar and is used as a disinfectant in moth balls and in the manufacture of dyes and explosives.

Diethyl Phthalate
(ethyl phthalate) - is used as a solvent and a fixative perfume, a denaturant for alcohol and cosmetics because of its extremely bitter taste irritating to mucous membranes, central nervous system depression when absorbed.

bis-2 Ehtyl Hexyl
phtalate - (Dioctyl-sodium sulfosuccinate) a powerful wetting compound used as a laxative. Can cause diarrhea and intestinal bloating.

1,4-Dichlorobenzene - used in making insecticides, phenol and dyes, engine cleaners and solvents, for resins and lacquers, moth repellants, air deodorants. Concentrates in fats and is highly resistant.

1,1-Dichloroethane - used in making vinyl chloride and tetraethyl lead. Also an insecticide fumigant and used in paint and varnishes, soaps, in wetting and penetrating agents, in ore flotation. A carcinogen.

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METALS

Arsenic - is a very poisonous element used in insecticides, glass, medicines and dyes. In addition to its high toxicity, arsenic may cause matitis, lung and lymphatic cancer. Cumulative effects include disorders of alimentary tract, nausea, vomiting, diarrhea, dehydration, neuritis and paralysis of wrist and ankle muscles. Symptoms include metallic taste and odor of garlic on breath, burning pain in gastrointestinal tract, vomiting and purging, shock syndrome, coma and convulsions, paralysis and death.

Cadmium - is a soft metal used in the manufacture of fusable alloys, electroplating and control rods for nuclear reactors. It is a known carcinogen and effects jungs and kidneys.

Lead - is a poisonous metal used in paints, plumbing and alloys. Toxicity occurs if more than .5 mg/day is absorbed. Lead may impair any part of the nervous system. Lead also effects the kidneys and blood.

Manganese - is a poisonous metal used in numerous alloys which, if ingested over long periods results in muscular weakness, peculiar gait, tremors, central nervous system disturbance and salivation and kidney malfunction.

Chromium - is a metal used in electroplating and alloys. It is a know carcinogen; symptoms of poisoning are pain, diarrhea, collapse, cramping and death due to kidney failure. It is also associated with lung cancer, lung irritation and skin ulcers.

Cyanide - Cyanides are the most common and most deadly poisons known. Cyanide also effects the thyroid and has blood and respiratory effects.

Phenol - is a colorless or light pink solid and dangerous due to its rapid corrosive action on tissues. It is a hazardous substance to skin and eyes. Coma may occur within 30 minutes of skin exposure. Phenol also effects the liver and kidneys.

Chlorine - is a highly poisonous gas used as a bleaching agent and germicide. Excessive exposure can be fatal.

Mercury - is a poisonous metal which causes central nervous system breakdown and mental effects, abdominal cramps, increased salivation and kidney malfunction.

PESTICIDES

Endosulfan - also known as Thioden

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CONCLUSIONS

It is necessary to understand the structure of the Combe Fill Landfill in order to draw conclusions from the test results. Figure 12 shows that structure.

Rain falling on the top of the landfill runs off the surface, picks up contaminants and flows in the direction of streams. Once infiltrating the landfill water will move laterally, again picking up contaminants, and appear at the edge of the landfill in seeps or springs. Water percolating through the alternating layers of compacted waste and cover may also move vertically, escaping from the bottom of the landfill and mixing with groundwater in the underlying bedrock. Water flowing through the landfill picks up a wide variety of contaminants and is called leachate. At Combe Fill, no provisions are made to prevent leachate from traveling to and mixing with both surface and groundwaters.

The water quality test results clearly show that the landfill is producing leachate and that within the property this leachate has contaminated surface, shallow subsurface and deep groundwaters (see results for stations URWA S-2, DEP S-1, URWA S-5, DEP S-2, URWA SW-2, DEP DW-4).

The data also indicates pollution originating from both the older and new sections of the site. Furthermore, the results indicate that contamination is migrating from the site via both surface and groundwater routes (see station results URWA SW-4, DEP SW-5, URWA S-3, URWA S-4).

While results did not indicate "gross contamination" they did indicate significant levels of surface and groundwater pollution. Of particular concern, is the pollution of groundwater since once polluted it is virtually impossible to cleanse. Also, once entering the fractures of the underlying bedrock, the pollution could travel considerable distances. The total organic chemical reading at station DEP DW-4, a 100-foot plus well, of 762 ppb indicates a potentially serious groundwater contamination problem. This problem is magnified by the presence of about 38 domestic residential wells within 1/4 mile from the landfill's active face and 60 wells within a 1/2 mile distance.

The total organic chemical reading of 1005 ppb at station URWA S-2 indicates significant surface water pollution. Since many of the organic chemicals will volatilize as they travel downstream, pollution downstream should diminish. However, this is not true in groundwater flows.

The variety of chemicals found in the test results, 33 different types, is reason for concern. Little is known about the synergetic effects of chemicals once combined. It is quite likely that two chemicals when combined could produce a new compound more harmful than either original one.

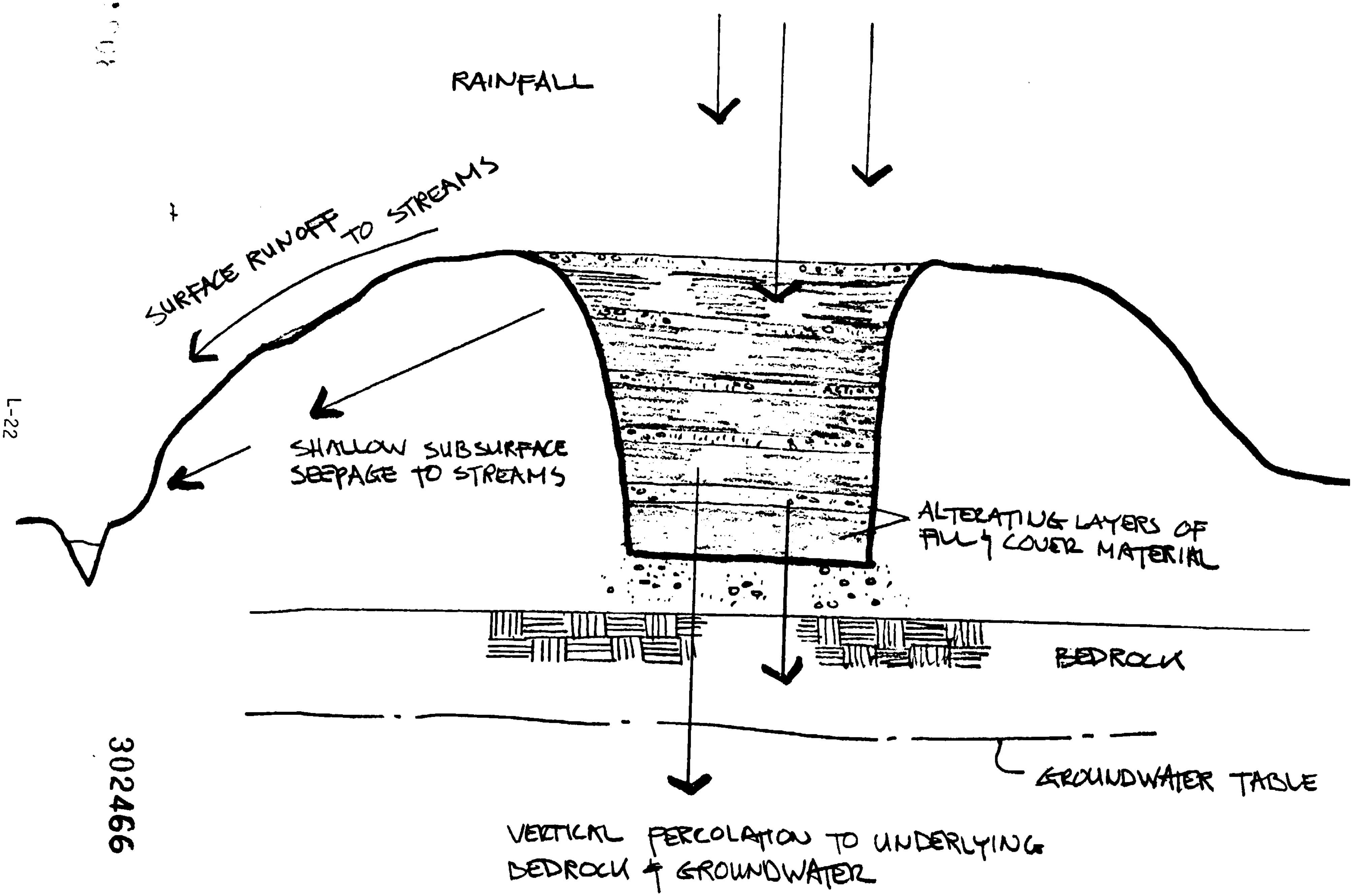
The extremely high concentrations of manganese found at most all of the sample locations is also reason for serious concern.

There is little doubt that the landfill is a source of serious pollution, however, it is not yet known how far by surface or groundwater the pollution has traveled. A testing program of residential wells along Parker Road, down gradient from the landfill, will assist in determining the magnitude of threat which the landfill poses to the public health and welfare.

Since the results indicate that there is both surface and groundwater contamination at the landfill and that the contamination is migrating from the site, it is the author's opinion that the facility should be closed.

FIGURE 12:

COMB FILL: CROSS-SECTION



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NOTES

1. Affidavit of Robert Hordon in the matter of Township of Chester, et al. vs. Combe Fill Corporation and the N.J. Department of Environmental Protection.

2. See the following:
   a. Letter from Oliver T. Alstrom, Assistant Field Supervisor, U.S. Department of the Interior, Fish and Wildlife Service, to Edward R. Russo, Council Present, dated February 26, 1981.
   b. Affidavit of John A. Castner in the matter of Chester Township, et al. vs. Combe Fill Corporation.
   c. Affidavit of Daniel Toder in the above matter.

3. Fowler, Angela, et al. The Chester, The Mendhams: A Natural Resource Inventory and Environmental Study; 1976.

4. Morris County Soil Conservation Service, Soil Survey of Morris County, New Jersey, August 1976.

5. See especially:
   State Department of Environmental Protection Memorandum to Beatrice Tyluki, Director Solid Waste Administration, from Frank Markewicz, Supervising Geologist, re: Chester Hills Landfill Investigation, dated March 13, 1979.

6. State Department of Environmental Protection Memorandum to Lee Pereria, Solid Waste Administration from Frank J. Markewicz, Acting State Geologist, re: Combe Landfill South Field Inspection, dated February 24, 1981.

7. "Draft Report: Combe Fill South," Morris County Solid Waste Coordinator, April 9, 1981.

8. Township of Chester, et al. vs. Combe Fill Corporation, et al. Docket No. C-2094-80E, Superior Court of New Jersey, Chancery Division-Morris County.

9. "Order Modifying Registration: In the Matter of Combe Fill Corporation, Inc., Facility Registration, Number 1407A." Edward J. Landres, Assistant Director, Enforcement Branch, Solid Waste Administration, March 19, 1981.

10. U.S. Environmental Protection Agency in the Matter of Combe Fill Corporation, Proceedings Under Section 309a.3 & 4, Clean Water Act, 33 U.S.C. & 1319a(3)(4), March 19, 1981, Julio Morales-Sanchez, Director, EPA, CWA-11-81-7; Enforcement Division, Region II, USEPA.

11. Letter from Raymond A. Webster, P.E., Manager Water Allocation Section, Division of Water Resources, to Mr. Gary Molchan, Vice President, Combe Fill Corporation, dated March 16, 1981.

12. In the Matter of the Adopted and Modified Solid Waste Management Plan of the Morris County Solid Waste Management District: Certification of Approval with Modification of the Morris County District Solid Waste Management Plan, January 29, 1981, Jerry Fitzgerald English, Commissioner.

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13. Dunn & Bradstreet, Review of Combe Fill Corporation and Combustion Equipment Associates, April 30, 1981.

14. See state-mandated quarterly tests from Chester Hills, Inc., January 27, 1977 through May 17, 1979. Also see files of Chester and Washington Township Boards of Health.

15. URWA, "A Proposal for Water Quality Testing at the Chester Hills Landfill."

16. Federal Register, Volume 44, Number 231, November 29, 1979.

17. Personal Communication with Haig Kasabach, Chief, Bureau of Groundwater Management, Division of Water Resources, N.J. Department of Environmental Protection, April 29, 1981.

18. Federal Register, November 28, 1980.

19. See the following:

Council on Environmental Quality, "Contamination of Groundwater by Toxic Organic Chemicals", January 1981.

Tucker, Robert Dr., Groundwater Quality in New Jersey: An Investigation of Toxic Contaminants", March 1981, Office of Cancer and Toxic Substances Research, N.J. Department of Environmental Pro-

Ross, Steven S., Ed., Toxic Substances Sourcebook, March 1978.

Ross, Steven S., Ed., Toxic Substances Sourcebook Series 2, August 1980.

Thomas, Clayton L., MD, MPH, Taber's Cyclopedic Medical Dictionary, F. A. Davis Company, 1970.

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APPENDIX M

OTHER POTENTIAL SOURCES OF ENVIRONMENTAL CONTAMINATION
WITHIN 5 mi. RADIUS OF COMBE FILL SOUTH

NAME OF FACILITY	TYPE OF FACILITY	LOCATION	APPROX. DISTANCE FROM LANDFILL (mi.)	DIRECTION
Quimby and Co.	Cleaning cpd and vibration pads	Oakdale Rd Chester	3.0	North
Simmons Precision/ Cooperative Industries	Electrical harness for gas turbine engines	Oakdale Rd Chester	3.0	North
TD4E, Inc.	Technical manual preparation for manufacture of electrical engines	Main St Chester	3.0	North
Utility Propane Co.	Liquid propane gas	Rt. 24 Chester	3.4	North
Cooper Chemical Co.	Reagent and Industrial chemicals	Parker Rd Long Valley	2.9	South
Frazier Industrial Co.	Structural steel storage racks	Fairview Ave Long Valley	2.2	West
Lanterman Machine & Tool	Microwave components	Parker Rd Long Valley	2.9	South
Markan Globol	Raw materials for pharmaceutical companies	Rollings Ridge Dr Long Valley	4.5	West
Valley Brook Machine & Tool Co.	Tooling and machinery	West Mill Rd Long Valley	4.8	Southwest
Welsh Farms	Manufacture dairy products	Fairview Ave Long Valley	2.2	West
Cherokee Rubber	-	Parker Rd Long Valley	2.9	South
Norberg Machine and Tool	-	Parker Rd Long Valley	2.9	South
MNTC	Warehouse	Parker Rd Long Valley	2.9	South
Budd Moving System	Moving and storage	Bartley Rd Flanders	4.5	Northwest
Byrne Ceramic Supply Co., Inc.	-	Bartley Rd Flanders	4.5	Northwest
Provimi Inc.	Specialty milk replacer for veal calves	Bartley Rd Flanders	4.5	Northwest

APPENDIX N

SUPPLEMENT TO LANDFILL REPORT: RADIOACTIVITY

BY

UPPER RARITAN WATERSHED ASSOCIATION

SUPPLEMENT to LANDFILL REPORT: RADIOACTIVITY

Test results for radioactivity in the form of gross alpha and gross beta contamination were received by the Upper Raritan Watershed Association on May 27, 1981. Princeton Testing Labs subcontracted the tests to Radiation Management, Inc. of Philadelphia, Pennsylvania which has an EPA certification to conduct such tests. Princeton is not certified to conduct radioactivity testing.

Radioactivity was measured in picocuries per liter (pci/l). A picocurie is that quanity of radioactive material producing 2.22 nuclear transformation per minute. U.S.E.P.A. Drinking Water Regulations (which apply only to public water supply systems used by twenty-five or more persons) set the maximum alpha particle activity at 15 pci/l. EPA regulations for beta activity are more complex and cover only radiation from man-made radionuclides. The limit is set at a total body dose or internal organ dose greater than 4 millirem per year, based on a two liter per day intake of water. A millirem is 1/1000 the amount of radiation which will cause the same biological effect as that due to one roentgen of x-rays.

The site of Combe Fill South is located in an area of known natural radioactivity from an element known as thorium. Thus, natural background radiation in the vicinity might be higher than in other areas. Exact data on natural background radiation are lacking at this time.

TEST RESULTS:

Site Test #	gross alpha	permissable counting error	gross beta	permissable counting error
G-5 (control)	1.05		2.56	
G-2 5646	3.49±2.8	79%	5.10±2.0	40%
G-4 Station 1	2.64		3.26±1.9	57%
S-1 Station 2	3.21		2.47±1.8	73%
S-2 Station 3	1.18		2.56	
S-3 Station 4	40.9±11	26%	33.4±3.7	11%
S-4 5647	2.28		14±2.6	18%
S-5 5649	2.94		34.9±3.7	10%

SUMMARY:

Station S-3, located on the west branch of Trout Brook on the Tingue property, had the highest levels of gross alpha (40.9±11) and the second highest levels of gross beta (33.4±3.7).

Station S-5, located within the landfill at the head of the east branch of Trout Brook, recorded the highest gross beta level (34.9±3.7).

Ground water samples generally showed lower amounts of both alpha and beta activity. The highest gross alpha reading (3.49±2.8) came from Site G-2, a shallow well (±20') just to the rear of the Filiberto residence. The same site also showed the highest gross beta reading (5.10±2.0).

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CONCLUSION:

At present it is not possible to determine if the radioactivity measured by these tests is caused by purely natural activities, natural activities aggravated by the landfilling action or by radioactive substances deposited in the fill.

However, it is clear that the West Branch of Trout Brook contained elevated levels of radioactivity in comparison to the other sites tested. Radioactive activity at this site exceeded the EPA standard for drinking water by 2.6 times. If this were a potable water source for 25 individuals, it would be in violation of the Federal standards.

In addition, the higher beta activities recorded at S-5 may indicate the presence of radioactive material in the older section of the fill. Whether or not this material is natural or man-made, could not be determined by this sampling process.

Groundwaters showed generally lower concentrations of radioactive activity. However, G-2 showed levels of gross alpha over 3 times the levels found in the control groundwater sample (G-5) and roughly twice the gross beta activity.

RECOMMENDATIONS:

1. Testing for gross alpha and gross beta be continued in residential well tests. Cost is low ($6.00/sample for gross alpha, $8.00 for gross beta).

2. An attempt be made to establish more accurate background data for the area as a whole.

3. An attempt be made to trace the source of the radioactive activity at S-3.

4. Make testing for radioactivity mandatory for all new wells established in areas of known radioactive occurrence.

5. Attempt to ascertain whether the landfill has or could have accepted radioactive materials in the past.

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APPENDIX O

MEMO CONCERNING SITE GEOLOGY

MARK GERMINE - NJDEP

7/21/82

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GEORGE J. TYLER, ASSISTANT COMMISSIONER
CN 402
TRENTON, N.J. 08625
609-292-8058

October 26, 1982

Geology & EM survey

Honorable Frank Adessa, Mayor
Township of Chester
P. O. Box 428
Parker Road
Chester, New Jersey 07930

Dear Mayor Adessa:

This letter is an update of the Department's activities concerning Combe Fill South. It includes a summary of the geohydrologic investigation and an enforcement update.

In July and August, the Department conducted geologic and geophysical investigations at Combe Fill South, including an electromagnetic terrain conductivity survey. High conductivity is often a function of the presence of pollutants in the ground water. Generally conductivity decreases as depth increases. The focuses of concern from the conductivity survey are those areas where conductivity is inordinately high or increases with depth. Our findings are attached.

In the near future, the Department will be implementing these recommendations in order to refine the delineation of the full extent of ground water problems. As you know, this more detailed investigation, building upon what has been done to date, is a prerequisite to preparing a viable cleanup plan for the landfill.

The Department is continuing to pursue implementation of interim remedial measures from the bankruptcy trustee. They are: preventing access to the site, seeding and grading, final covering, ground and surface water interception systems, leachate treatment systems and regular and continuing sampling and analysis of existing ground water analysis. The Department is prepared to obtain needed work at the site through compulsory judicial process if voluntary compliance is not forthcoming.

I trust this update adequately addresses your concerns. Please call me if I can be of further assistance.

Sincerely,
ORIGINAL SIGNED BY
GEORGE J. TYLER

302474

George J. Tyler
Assistant Commissioner for
Environmental Management

p
Enclosure
c: Health Officer Matteo

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GEORGE J. TYLER, ASSISTANT COMMISSIONER
CN 402
TRENTON, N.J. 08625
609-292-8068

October 26, 1982

Honorable Edward Shields, Mayor
Township of Washington
P. O. Box 216
43 Schooley's Mountain Road
Long Valley, New Jersey 08753

Dear Mayor Shields:

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Sincerely,

302475

ORIGINAL SIGNED BY
GEORGE J. TYLER

George J. Tyler
Assistant Commissioner for
Environmental Management

p
Enclosure

c: Health Officer Matteo

APPENDIX O

MEMO CONCERNING SITE GEOLOGY

MARK GERMINE - NJDEP

7/21/82

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GEORGE J. TYLER, ASSISTANT COMMISSIONER
CN 402
TRENTON, N.J. 08625
609-292-8058

October 26, 1982

Geology &
EM survey

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Sincerely,

302477

ORIGINAL SIGNED BY
GEORGE J. TYLER

George J. Tyler
Assistant Commissioner for
Environmental Management

p
Enclosure
c: Health Officer Matteo

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GEORGE J. TYLER, ASSISTANT COMMISSIONER
CN 402
TRENTON, N.J. 08625
609-292-8058

October 26, 1982

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43 Schooley's Mountain Road
Long Valley, New Jersey 08753

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In July and August, the Department conducted geologic and geophysical investigations at Combe Fill South, including an electromagnetic terrain conductivity survey. High conductivity is often a function of the presence of pollutants in the ground water. Generally conductivity decreases as depth increases. The focuses of concern from the conductivity survey are those areas where conductivity is inordinately high or increases with depth. Our findings are attached.

In the near future, the Department will be implementing these recommendations in order to refine the delineation of the full extent of ground water problems. As you know, this more detailed investigation, building upon what has been done to date, is a prerequisite to preparing a viable cleanup plan for the landfill.

The Department is continuing to pursue implementation of interim remedial measures from the bankruptcy trustee. They are: preventing access to the site, seeding and grading, final covering, ground and surface water interception systems, leachate treatment systems and regular and continuing sampling and analysis of existing ground water analysis. The Department is prepared to obtain needed work at the site through compulsory judicial process if voluntary compliance is not forthcoming.

I trust this update adequately addresses your concerns. Please call me if I can be of further assistance.

Sincerely, 302478

ORIGINAL SIGNED BY
GEORGE J. TYLER

George J. Tyler
Assistant Commissioner for
Environmental Management

p
Enclosure

c: Health Officer Matteo

10/26/82

SOUTHWEST CORNER

Conductivity increased with depth on the immediate perimeter of the landfill. As no leachate seeps were noted, the possibility exists that leachate is present within the bedrock formation. It is recommended that a monitor well be installed in this corner.

NORTHEAST CORNER

Conductivity increased with depth. It is believed that a narrow zone of leachate has been identified at this location. An additional monitoring well should be installed. The existing well should be logged, and a piezometer, for determining vertical variation in pressure head, should be installed adjacent to the existing well.

EASTERN PERIMETER

Conductivity was generally low. Monitor well-MW-2 should be logged.

SOUTHEASTERN CORNER

Deep readings could not be obtained in certain areas. This indicates that the rock formation lacks significant permeability with depth, although the presence of leachate cannot be excluded. The area is adequately monitored by the existing well.

WESTERN PERIMETER

Elevated readings of terraine conductivity were noted in the area west of Trout Brook. The reason for this is not clear. A monitoring well should be installed to monitor for under flow in the rock aquifer below Trout Brook.

NORTHWEST CORNER

Decreased conductivity with depth was found; monitor well should be installed to aid in determining regional ground water flow and background water quality.

302479

ADM-0

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Frank J. Markewicz, Acting State Geologist

FROM Mark Germine, Assistant Geologist MG **DATE** July 21, 1982

SUBJECT Combe-South Landfill, Chester & Washington Twps., Morris County

On Tuesday, June 29, 1982, I conducted a geologic reconnaissance examination of the Combe-South Landfill and surrounding area in Chester and Washington Townships. Geologic data was collected at five locations in the mapped area (see attached). In addition, float was examined throughout the area. Rock samples were slabbed, polished, etched, and stained (for K-spar).

Four distinct rock types were noted in the area mapped. They are as follows:

1) Alaskite gneiss - buff-colored, strongly foliated gneiss principally composed of elongate streaks of smoky quartz, plagioclase (oligoclase), K-spar, hornblende and opaques, trace monazite. Prominent parting along foliation.

2) Hornblende granite - buff to pink-colored, weakly to moderately foliated granite containing quartz, oligoclase, K-spar, and hornblende.

3) Alaskite - dark gray, buff to brown weathering alaskite. Foliation weakly developed to absent. Composed of quartz, oligoclase, and K-spar, with accessory hornblende and opaques.

4) Amphibolite - foliated rock containing hornblende and plagioclase. Occurs as thin bands in other rock units. A distinct band of amphibolite was reportedly excavated in the southwestern portion of the landfill and backfilled with garbage.

Foliation is consistent throughout the mapped area, averaging N50°E, 80°SE. Here, as elsewhere in the Highlands, foliation probably reflects tight isoclinal folds. Highly foliated units (e.g. "Alaskite gneiss") may correspond to the stretched limbs of such folds. Fairly well developed joints occur within the landfill area. These belong to three groups:

1) Foliation set - present throughout the area but particularly well developed in the granite outcrop in the northern portion of the landfill. Appears to be a predominantly near-surface feature.

2) Conjugate shear sets - pair of steeply dipping to vertical sets trending at about N10°W and N45°W. Poorly to moderately well developed on landfill site. Not noted elsewhere. It is probable that these joint sets are conjugate shear pairs. The direction of maximum compression would bisect the acute angle made by the sets, in this case indicating a more or less horizontal directional of maximum compressive stress trending about N28°W. This direction of compressive stress is apparently expressed by joints throughout the Highlands and may be connected with the Appalachian Revolution (late Paleozoic). The relatively low angle (35°) between the joint sets under consideration has been interpreted elsewhere in the New Jersey Highlands as indicating that tension was the chief stress involved. Such tension is thought to result from

302480

Combe-South Landfill, Chester & Washington Twps., Morris County (Contd)

minor adjustments in a predominantly compressional deformational regime. Minor faults in Northern New Jersey are typically parallel to one of these conjugate shear sets, indicating that both are caused by the same forces.[2] Epidote slickensides found on rock rubble in the landfill area are thought to be associated with motion related to these joint surfaces.

3) Sheeting - more or less horizontal fractures which are most pronounced in the upper 5 or 10 feet below the soil interface. Noted only in the northern sector of the landfill.

In addition, aerial photographs (1964, 1:12,000) were examined for lineaments. Two vague topographic lineaments were noted in the mapped area, and are shown on the attached map. There was some tonal expression on the northeastern lineament, while the southwestern lineament was more clearly expressed topographically. These features are of unknown affinity, but may have some connection with the shearing discussed above.

Wells in the area are typical for the Highlands. Yields range from 0-30 gpm. No wells were noted in association with the above-described lineaments.

Although it is not possible to predict the direction(s) of leachate migration from the landfill, observations suggest that most leachate will move out radially in the near surface zone of weathering, sheeting, and foliation jointing. This leachate will probably tend to make its way into the prevailing drainage regime and eventually, for the most part, find its way to Trout Brook and Reinhardt Brook. Infiltration to levels of deeper groundwater flow may occur along joints, particularly where the rock is well foliated. The highest potential for rapid transmission of contaminated groundwater is likely to be in the directions of trend of conjugate shear joints and/or linear features. Leachate migration into bedrock will proceed much faster and in greater volume where the amphibolite band was excavated.

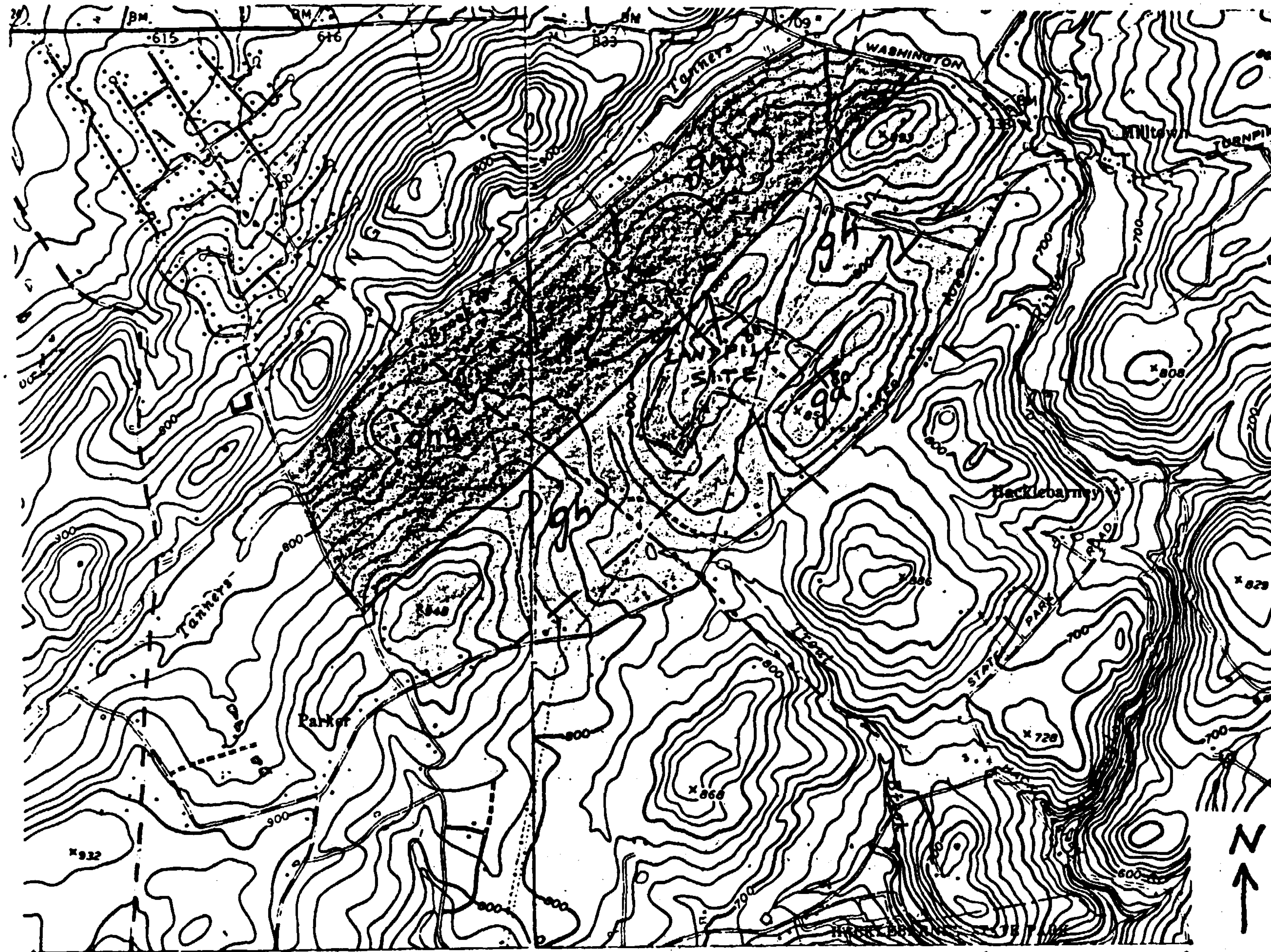
1 A.N. Appleby, <u>A Study of Joint Patterns in Highly Folded and Crystalline Rocks, with Particular Reference to Northern New Jersey</u>, Ph.D. Dissertation, New York University, 1940.

2 Ibid.

js

302481

VICINITY - Mark Germine, Asst. Geologist July, 1982



Base Maps - U.S.G.S. Hackettstown and Chester Quads.
Scale 1:24,000 Foliation Jointing

LEGEND

gna Alaskite gneiss
gh Hornblende Granite
ga Alaskite
Contact
Inferred contact

0-4

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Frank Markewicz, Acting State Geologist

FROM Robert Canace through Wayne Hutchinson and Haig F. Kasabach, Chief, Bureau of Ground Water Managment

DATE AUG 10 1982

SUBJECT Combe Landfill South, Chester, New Jersey — Terrain Conductivity Investigation

An electromagnetic terrain conductivity geophysical survey was conducted on the perimeter of Combe Landfill South, to attempt to delineate zones of possible ground water contamination. The survey was conducted partially on-site and partially off-site in order to develop comparative data and to investigate possible off-site migration of contaminants.

The terrain conductivity instrument can be used to help locate principal zones of ground water storage and movement in a bedrock aquifer, such as that below the above-referenced landfill. Additionally, zones of contaminated ground water can add to the instrument's resolution. In the survey, a 20 meter cable was utilized. Readings were taken in the horizontal and vertical mode (figures 1 and 2). Horizontal readings with a 20 meter cable are generally capable of detecting conductivity of the ground to a depth of approximately 15 meters (45 feet); the vertical mode is capable of detection to a depth of 30 meters (90 feet). Where a pattern indicating values of terrain conductivity higher than background values appear along a traverse line, there is an indication that such an area can be considered a likely zone of highly conductive ground water.

Elevated ground water conductivity is often a function of the presence of pollutants. In a bedrock aquifer, such as that surveyed, water occurs in select planes, such as joints, foliation and bedding planes. Elevated terrain conductivity readings in a bedrock aquifer indicate the location of water-bearing weathered zones. Other indicators are used to judge the quality of this ground water. For example, an increase in conductivity with depth can be an indication that water quality deteriorates with depth, because the normal relationship is a decrease in conductivity with depth. This relationship, wherein conductivity increased with depth, was encountered in two areas of the Combe Landfill South. The likelihood is high that ground water contamination exists in the rock aquifer at those points.

Conclusions

Based upon the results of the geophysical investigation, the following should be done to investigate ground water pollution at the Combe South Landfill:

1. Additional geophysical survey lines are needed; these can be performed by the Bureau.

2. Additional monitor wells are defintely required. Monitor wells are needed -

   a. north of the landfill, between the landfill and Schoolhouse Lane, adjacent to the utility right-of-way,

   b. in the southwest corner of the landfill,

   c. immediately west of the landfill, west of Trout Brook,

   c. adjacent to monitor well MW-4, drilled to a depth of approximately 50 feet.

302483

AUG 10 1982

3. The existing monitor wells should be logged with a down-hole logging device. A caliper log and resistivity log can be performed by the Bureau.

Findings and Recommendations

The results of the conductivity investigation are summarized below. Readings are summarized in the attached tables and are contoured on figures 1 and 2. Recommendations are made for the location of additional monitor wells (Fig. 3).

Southwest Corner

Findings: An increase of terrain conductivity with increasing depth was noted on the immediate perimeter of the landfill. Since no leachate seeps were noted, there is evidence that the conductive water associated with leachate is present deep within the rock formation.

Recommendation: Install a monitor well in S.W. corner (Fig. 3 MW-SW) to investigate source of high ground conductivity at depth.

Northeast Corner

Findings: An increase in conductivity with increasing depth was noted between monitor well MW-4 and the power line. The likelihood that this increase is attributable to the presence of 100 feet of steel casing in the ground at MW-4 is negated by the fact that readings immediately east of MW-4, at a distance from the equivalent to the distance at which high readings were observed, are half (4-5 m.mho/m) of the elevated readings (9-10 m.mho/m). It is likely that the narrow zone of elevated conductivity values, as indicated in red contours in figure 2, is due to highly conductive ground water.

Recommendations:

a. Install a monitor well (MW-N) approximately 1000 feet and north of the landfill approximately 200 feet east of the high tension line (MW-N, fig. 3) to monitor ground water flow between the landfill and Schoolhouse Lane.

b. Log existing well MW-4 using the Bureau's logger. A resistivity and caliper log should be performed in the open hole below the 100 feet of casing.

c. Install a shallow (50 feet) 2" piezometer (MW-4A) adjacent to monitor well MW-4, for the purpose of determining the vertical variation in pressure head within the rock aquifer; alternately, this shallow piezometer could be located adjacent to proposed monitor well MW-N.

Eastern Perimeter

Findings: Values for terrain conductivity are generally low. This area corresponds with the Alaskite zone, as mapped by Mark Germane

302484

AUG 10 1982

of the State Geological Survey, low background values would be expected. Existing monitor wells 2 and 1 appear to be adequately located to monitor the ground water in this area.

Recommendations: a. Perform additional geophysical surveys in the northeast corner; this can be accomplished by the Bureau.

b. Log monitor well MW-2 with the resistivity and caliper log to determine the depth of casing and characteristics of the rock aquifer.

Southeastern Corner

Findings: Deep readings could not be obtained along lines B, C, and D (Figure 2). This is an indication that the rock formation lacks significant permeability with depth, but does not preclude the presence of leachate. Shallow terrain conductivity readings indicate a potential zone of investigation in the vicinity of monitor well MW-5. Well MW-5 appears to be adequately located to monitor the ground water in this area.

Western Perimeter

Findings: Elevated readings of terrain conductivity were noted in the area west of Trout Brook. Elevated readings from the horizontal mode may be attributable to the presence of clay soils and poorly-drained terrain. The pattern of the conductivity contours, though, does not correspond to ground patterns of moisture that were obvious in the field. The pattern noted is a possible indication or reflection of weathered zones in the rock aquifer.

Recommendations: A precautionary monitor well should be installed in the cleared area west of Trout Brook. The purpose of this well would be to monitor for under flow in the rock aquifer below Trout Brook, toward Tanners Brook. The proposed location of the proposed monitor well is at MW-W (Fig. 3).

Northwest Corner

Findings: Decreased conductivity with depth was noted in this area.

Recommendations: A monitor well should be installed in the northwest corner as a background well and to aid in determining the direction of regional ground water flow and background water quality. The proposed location is MW-NW, (Figure 3).

WQM30:clb

Attachments

cc: Arnold Schiffman, Director

302485

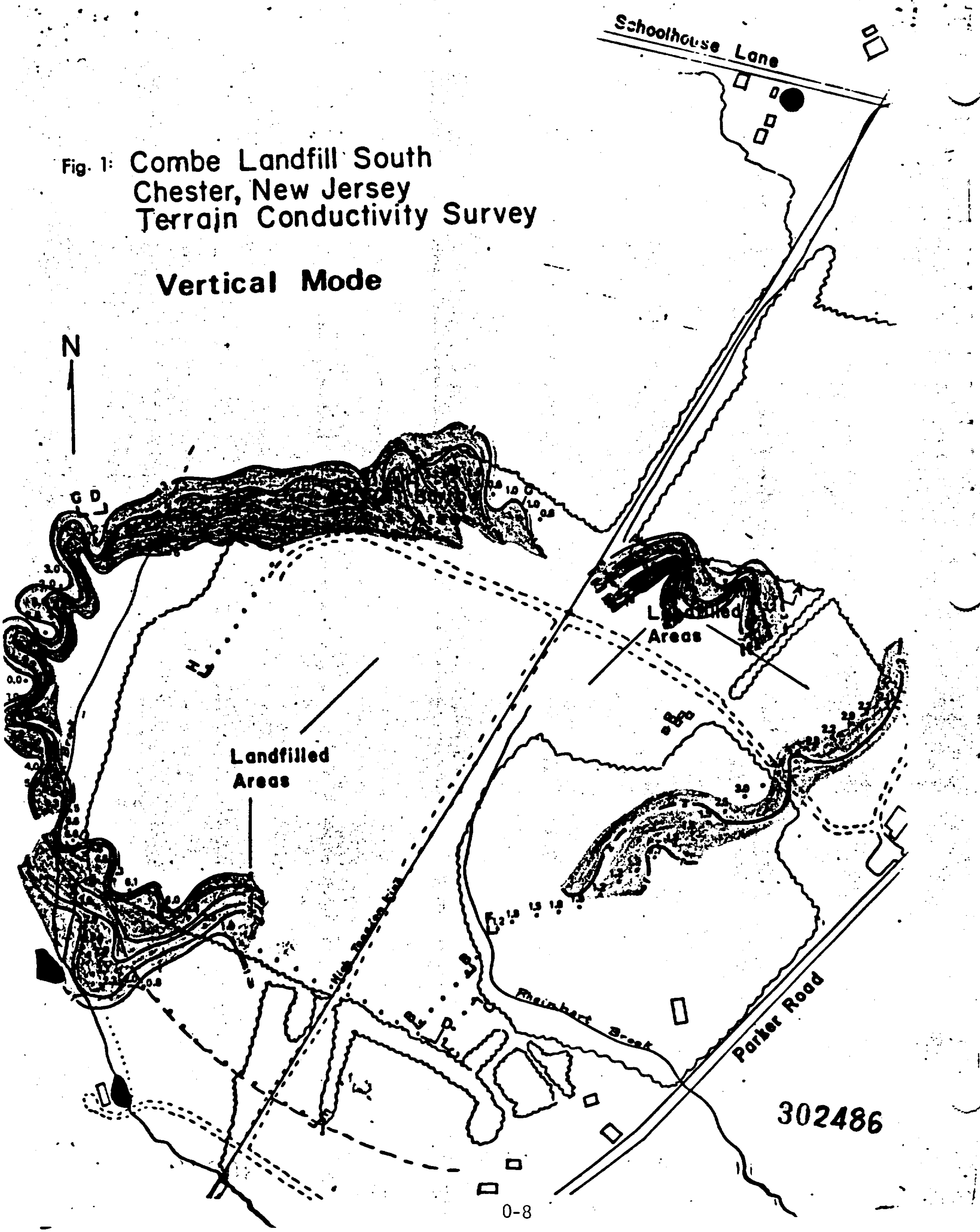
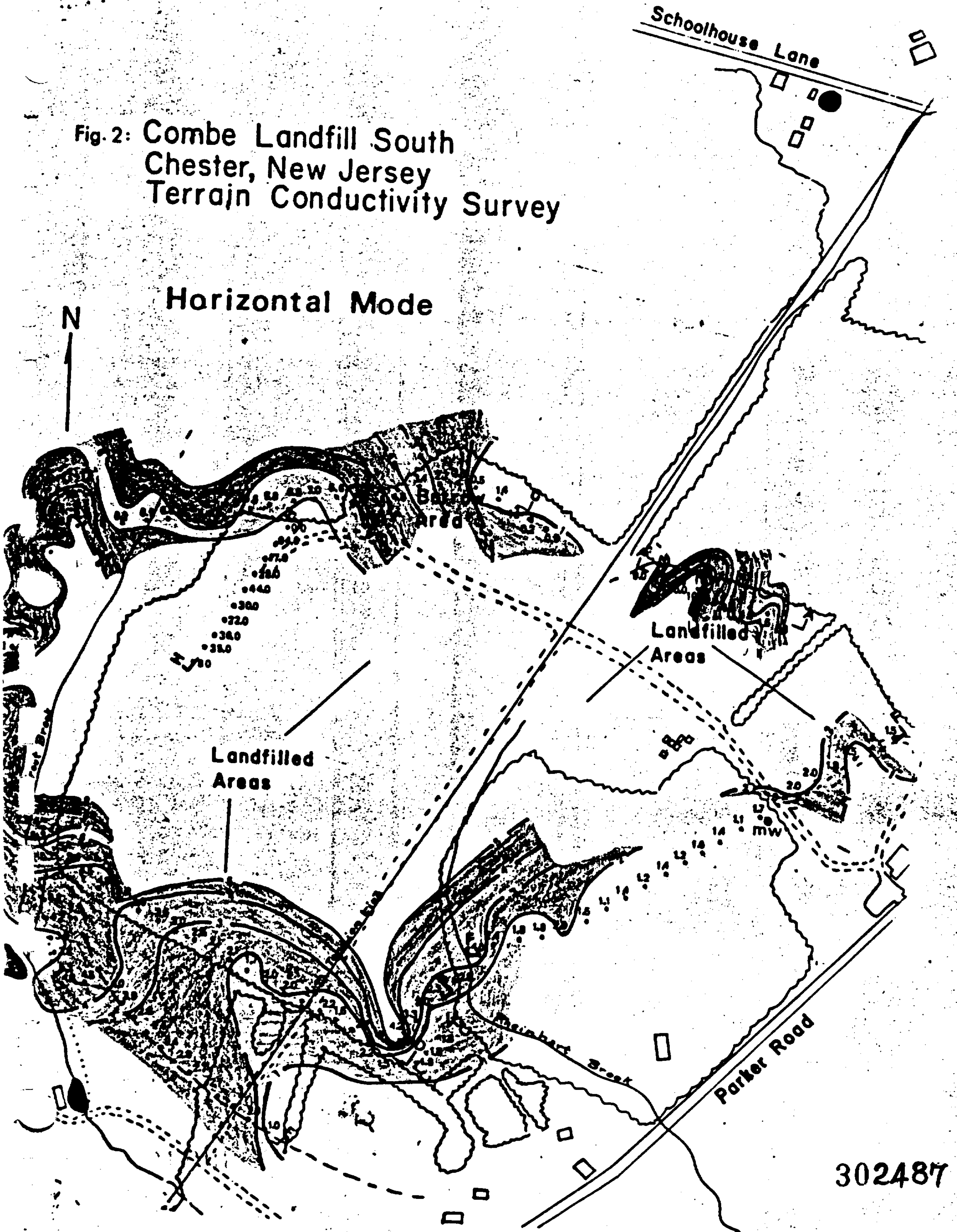
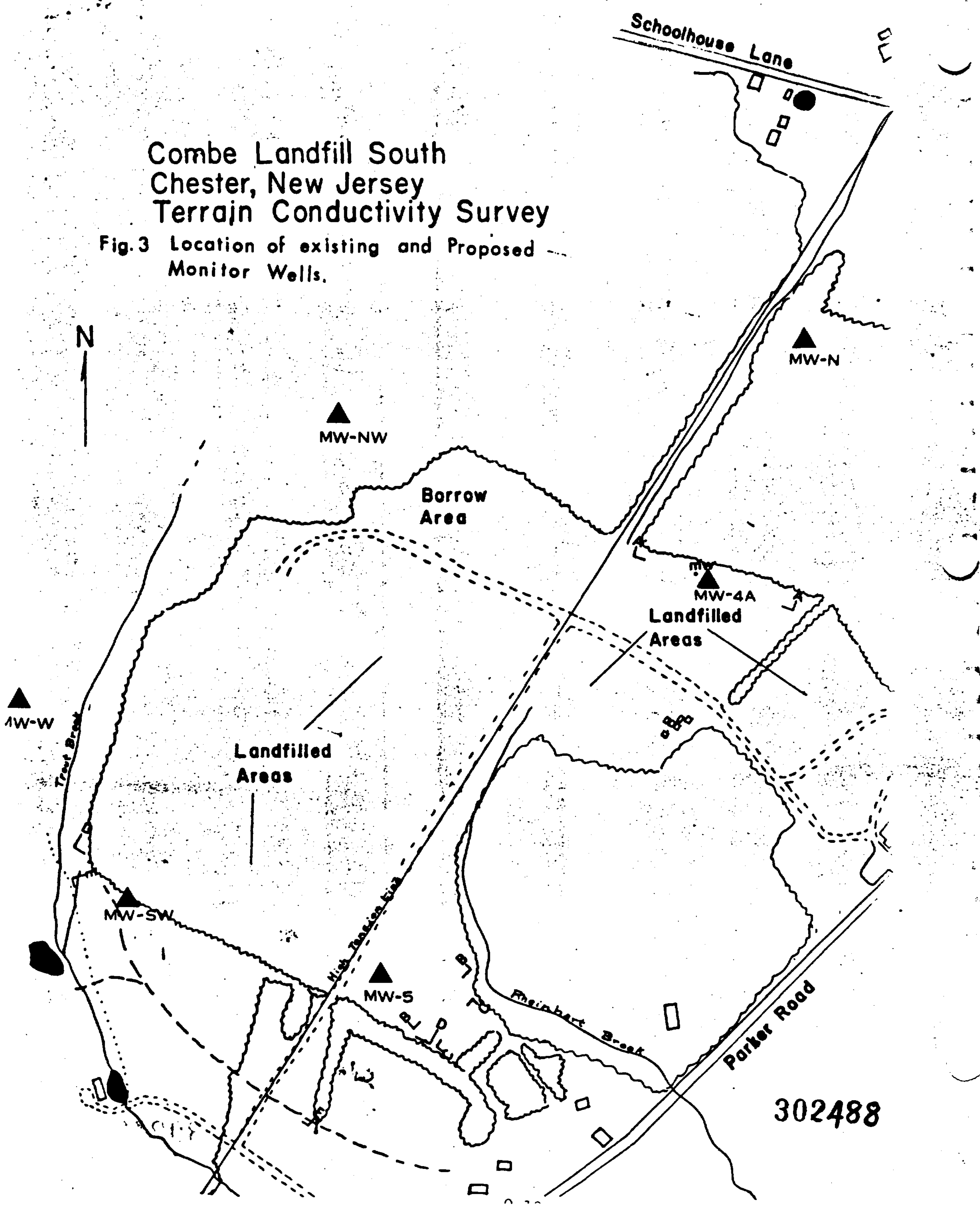


Fig. 1: Combe Landfill South
Chester, New Jersey
Terrain Conductivity Survey
Vertical Mode
N
Schoolhouse Lane
Landfilled Areas
Landfilled Areas
High Tension Line
Rheinhart Brook
Parker Road
302486

Fig. 2: Combe Landfill South
Chester, New Jersey
Terrain Conductivity Survey



302487

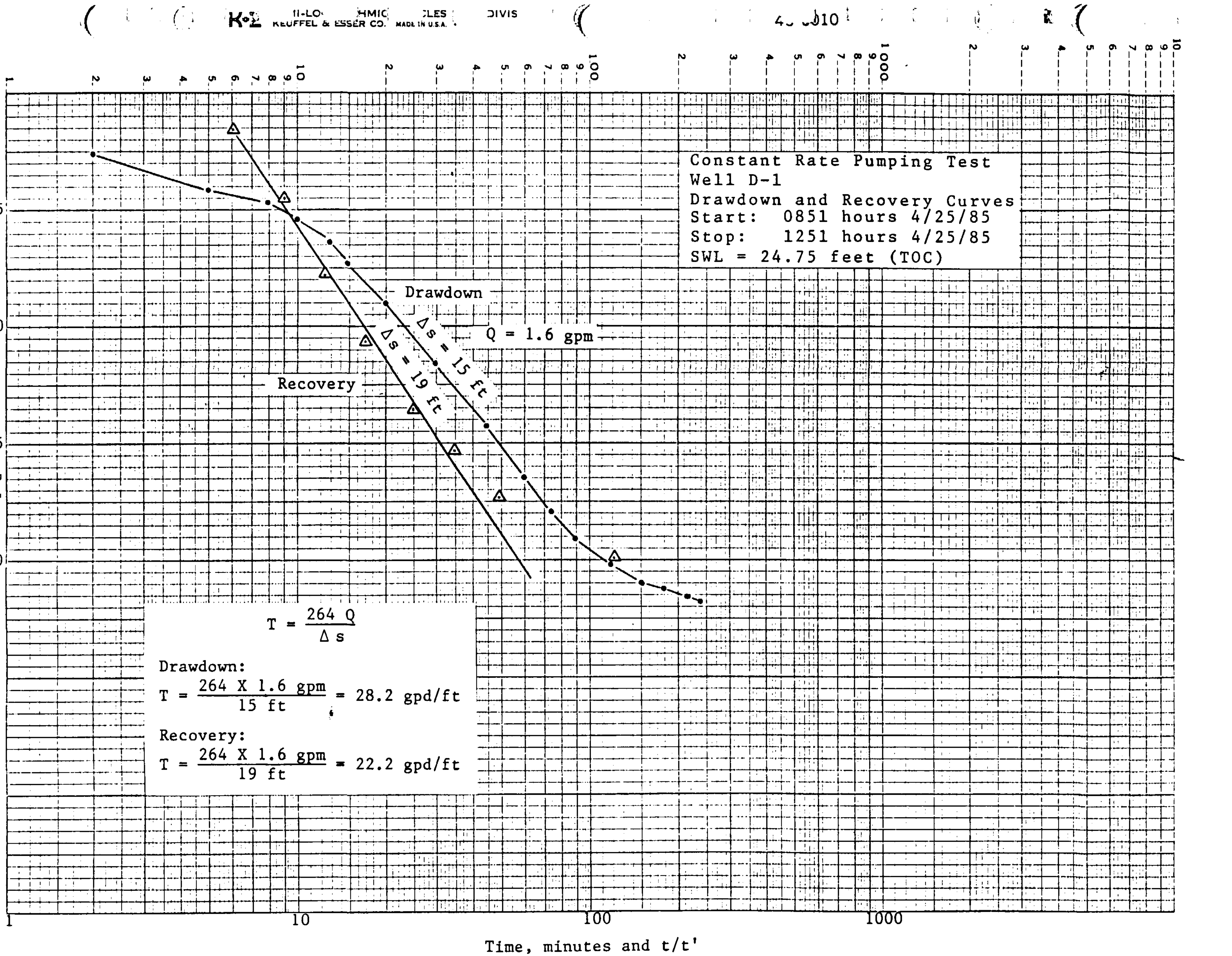


Combe Landfill South
Chester, New Jersey
Terrain Conductivity Survey
Fig. 3 Location of existing and Proposed Monitor Wells.

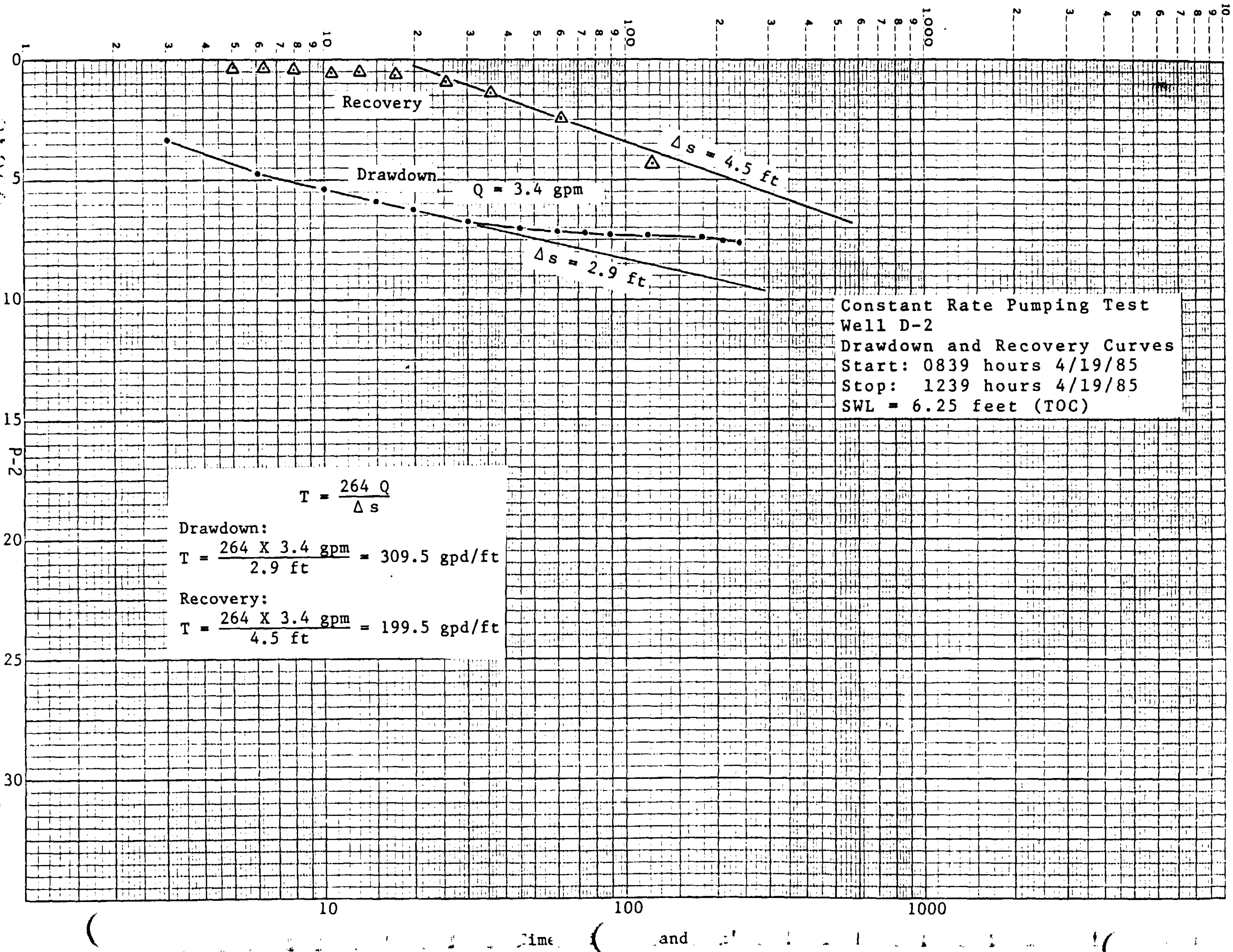
302488

APPENDIX P

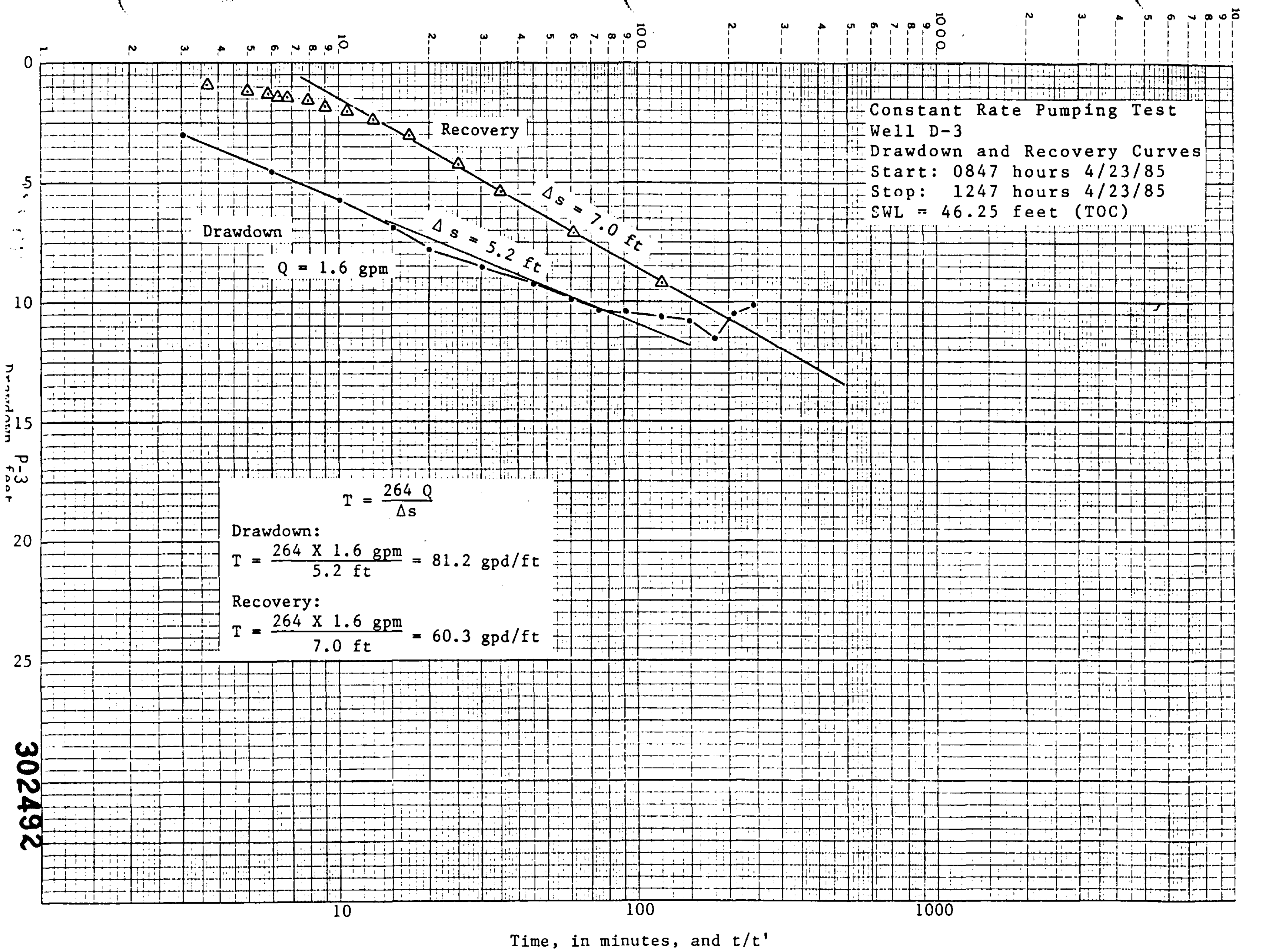
PUMPING TEST DATA


K+E KEUFFEL & ESSER CO. MADE IN U.S.A.
Constant Rate Pumping Test
Well D-1
Drawdown and Recovery Curves
Start: 0851 hours 4/25/85
Stop: 1251 hours 4/25/85
SWL = 24.75 feet (TOC)
Drawdown
Δs = 15 ft
Q = 1.6 gpm
Recovery
Δs = 19 ft
P-1
T = 264 Q / Δ s
Drawdown:
T = 264 X 1.6 gpm / 15 ft = 28.2 gpd/ft
Recovery:
T = 264 X 1.6 gpm / 19 ft = 22.2 gpd/ft
Time, minutes and t/t'

302490


Recovery
Drawdown
Q = 3.4 gpm
Δs = 4.5 ft
Δs = 2.9 ft
Constant Rate Pumping Test
Well D-2
Drawdown and Recovery Curves
Start: 0839 hours 4/19/85
Stop: 1239 hours 4/19/85
SWL = 6.25 feet (TOC)
T = 264 Q / Δs
Drawdown:
T = 264 X 3.4 gpm / 2.9 ft = 309.5 gpd/ft
Recovery:
T = 264 X 3.4 gpm / 4.5 ft = 199.5 gpd/ft
P-2
0
5
10
15
20
25
30
10
100
1000
Time
and

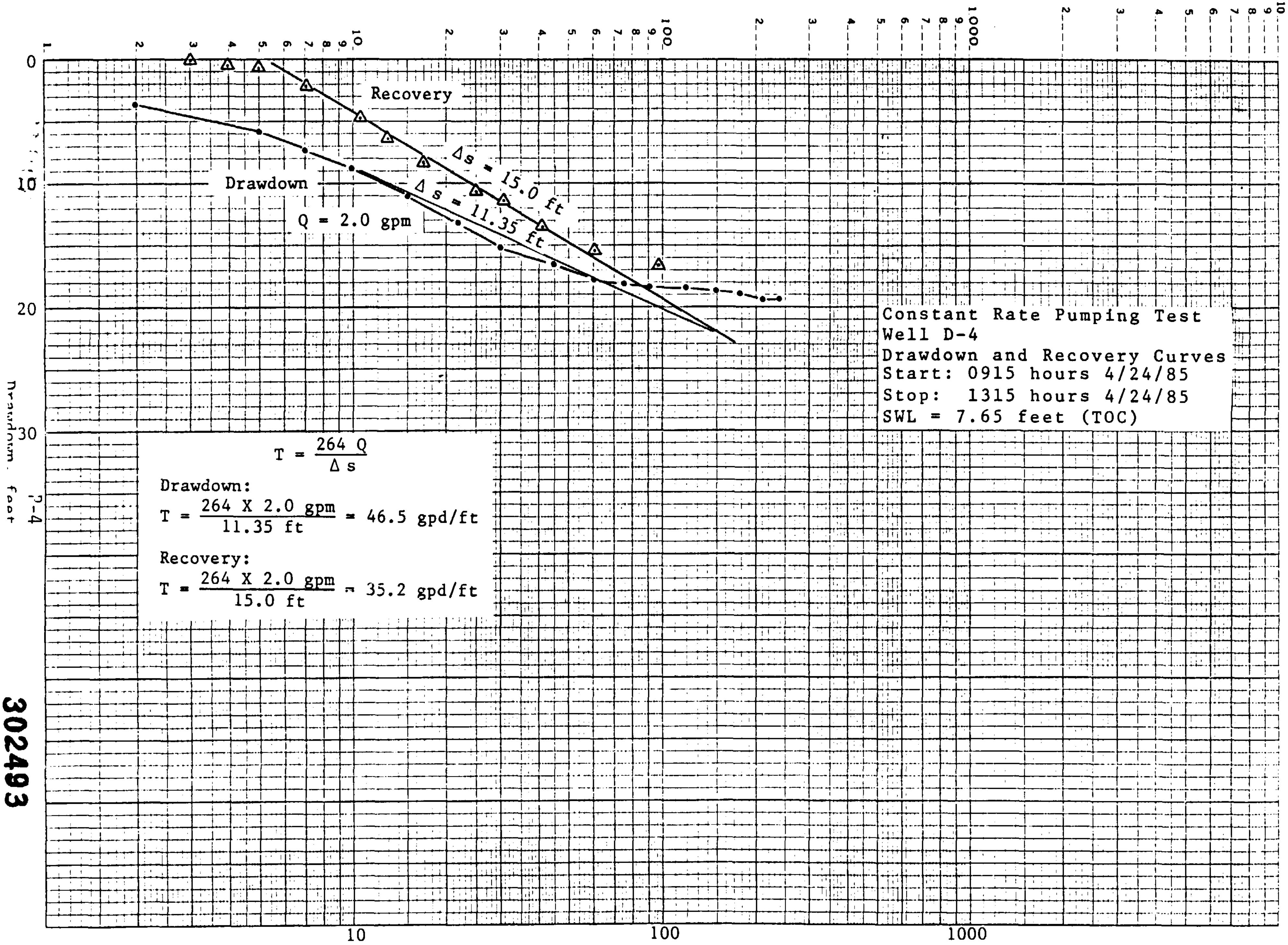
302491


Constant Rate Pumping Test
Well D-3
Drawdown and Recovery Curves
Start: 0847 hours 4/23/85
Stop: 1247 hours 4/23/85
SWL = 46.25 feet (TOC)
Recovery
Drawdown
Q = 1.6 gpm
Δs = 7.0 ft
Δ s = 5.2 ft
T = 264 Q / Δs
Drawdown:
T = 264 X 1.6 gpm / 5.2 ft = 81.2 gpd/ft
Recovery:
T = 264 X 1.6 gpm / 7.0 ft = 60.3 gpd/ft
0
5
10
15
20
25
10
100
1000
Drawdown P-3 feet
Time, in minutes, and t/t'

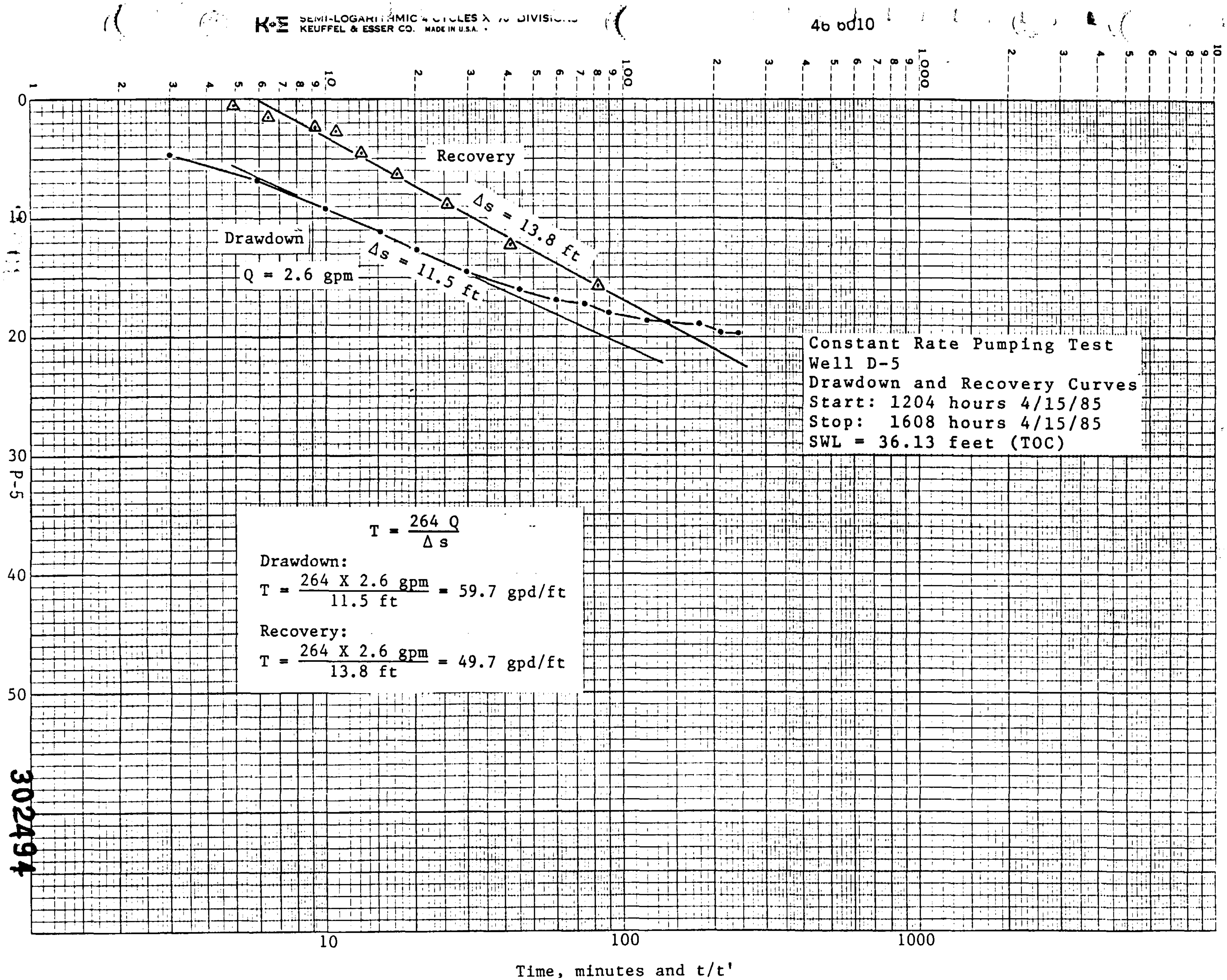
302492

K+E SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

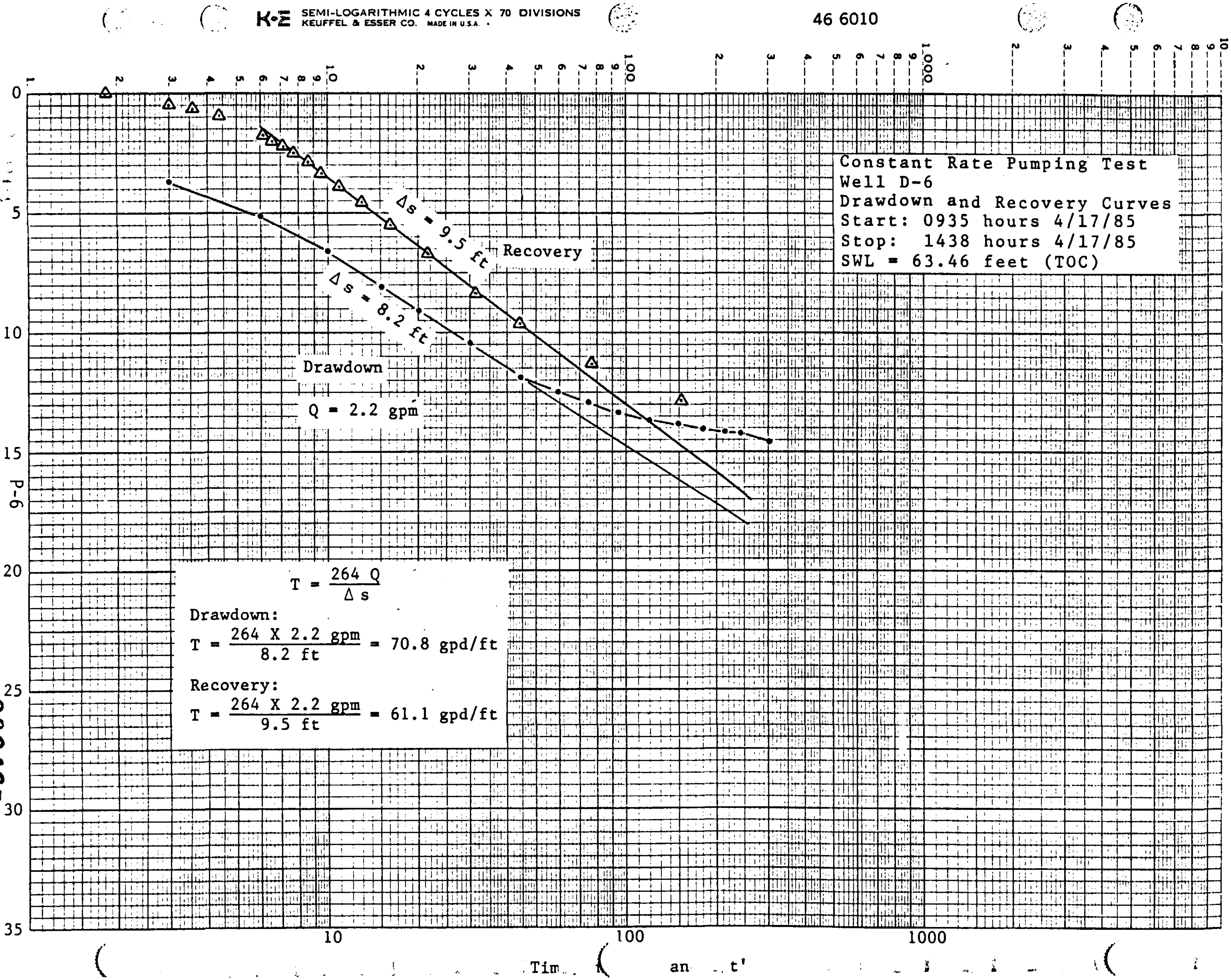
46 6010



302493

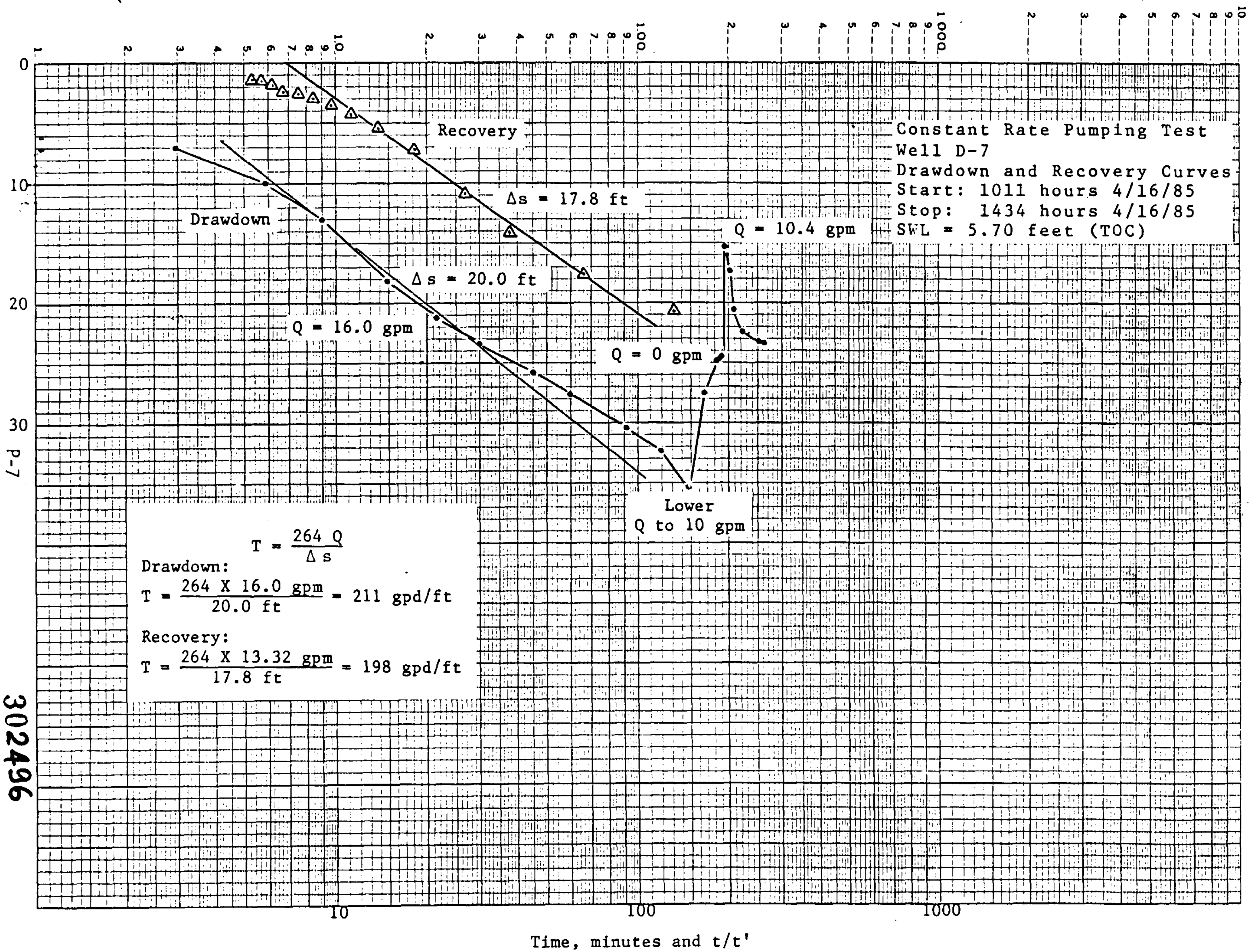

K+E SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A.
46 6010
Recovery
Δs = 13.8 ft
Drawdown
Q = 2.6 gpm
Δs = 11.5 ft
Constant Rate Pumping Test
Well D-5
Drawdown and Recovery Curves
Start: 1204 hours 4/15/85
Stop: 1608 hours 4/15/85
SWL = 36.13 feet (TOC)
T = 264 Q / Δ s
Drawdown:
T = 264 X 2.6 gpm / 11.5 ft = 59.7 gpd/ft
Recovery:
T = 264 X 2.6 gpm / 13.8 ft = 49.7 gpd/ft
P-5
Time, minutes and t/t'

302494


K+E SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 6010
Constant Rate Pumping Test
Well D-6
Drawdown and Recovery Curves
Start: 0935 hours 4/17/85
Stop: 1438 hours 4/17/85
SWL = 63.46 feet (TOC)
Δs = 9.5 ft
Recovery
Δs = 8.2 ft
Drawdown
Q = 2.2 gpm
T = 264 Q / Δs
Drawdown:
T = 264 X 2.2 gpm / 8.2 ft = 70.8 gpd/ft
Recovery:
T = 264 X 2.2 gpm / 9.5 ft = 61.1 gpd/ft
P-6
0
5
10
15
20
25
30
35
10
100
1000

302495

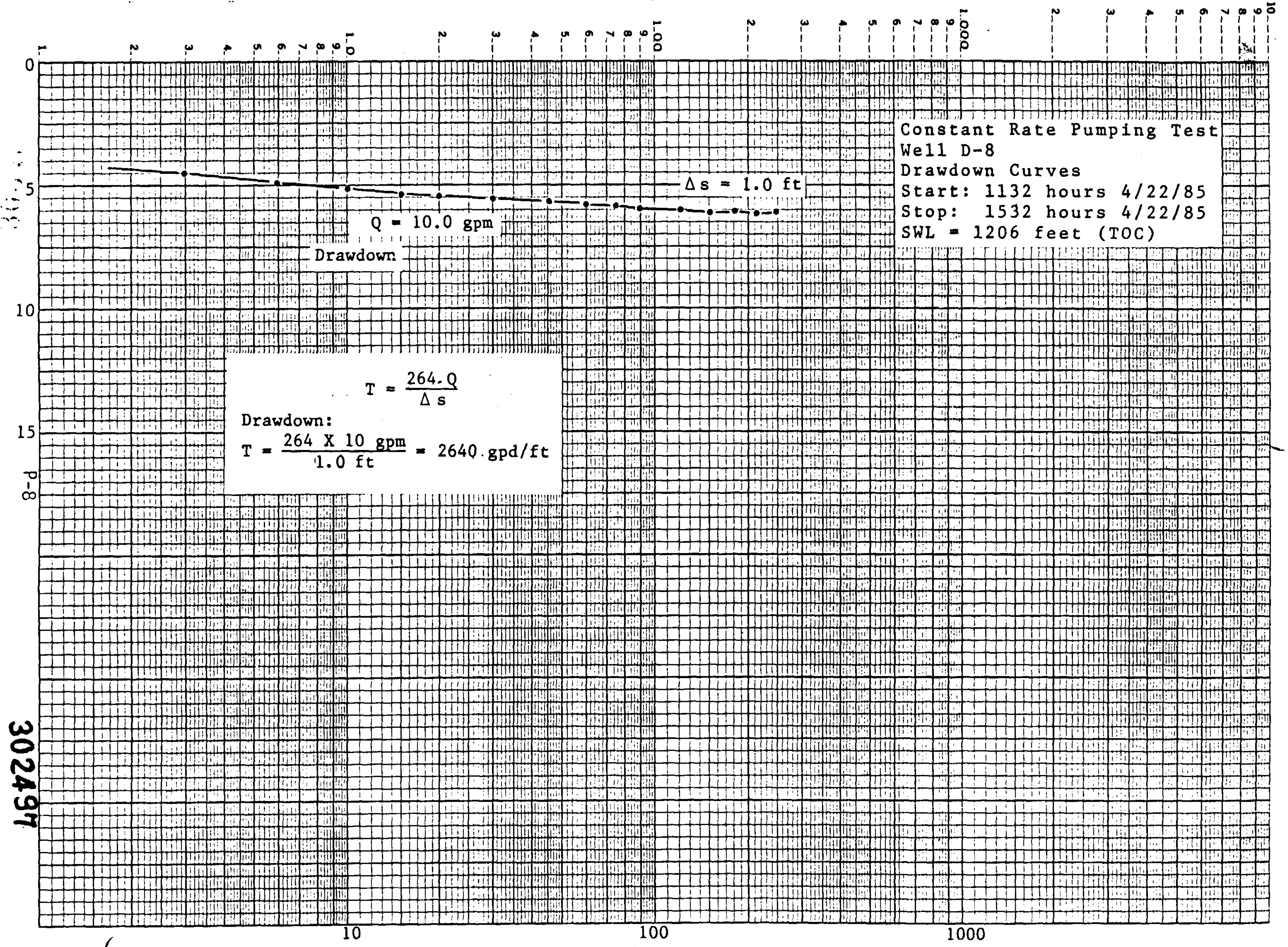
KEUFFEL & ESSER CO. MADE IN U.S.A. 46 6010



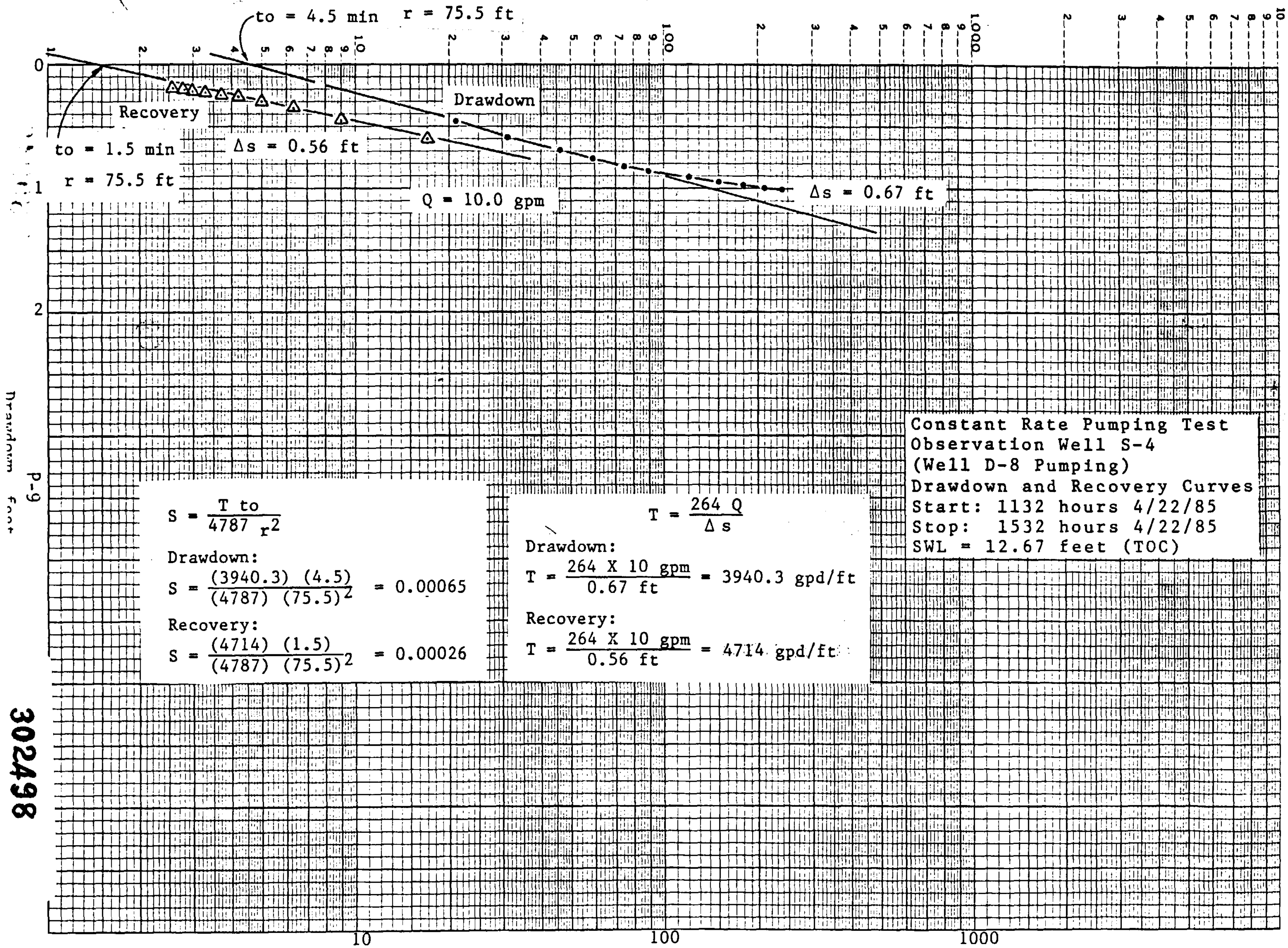
302496

K+E SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 6010

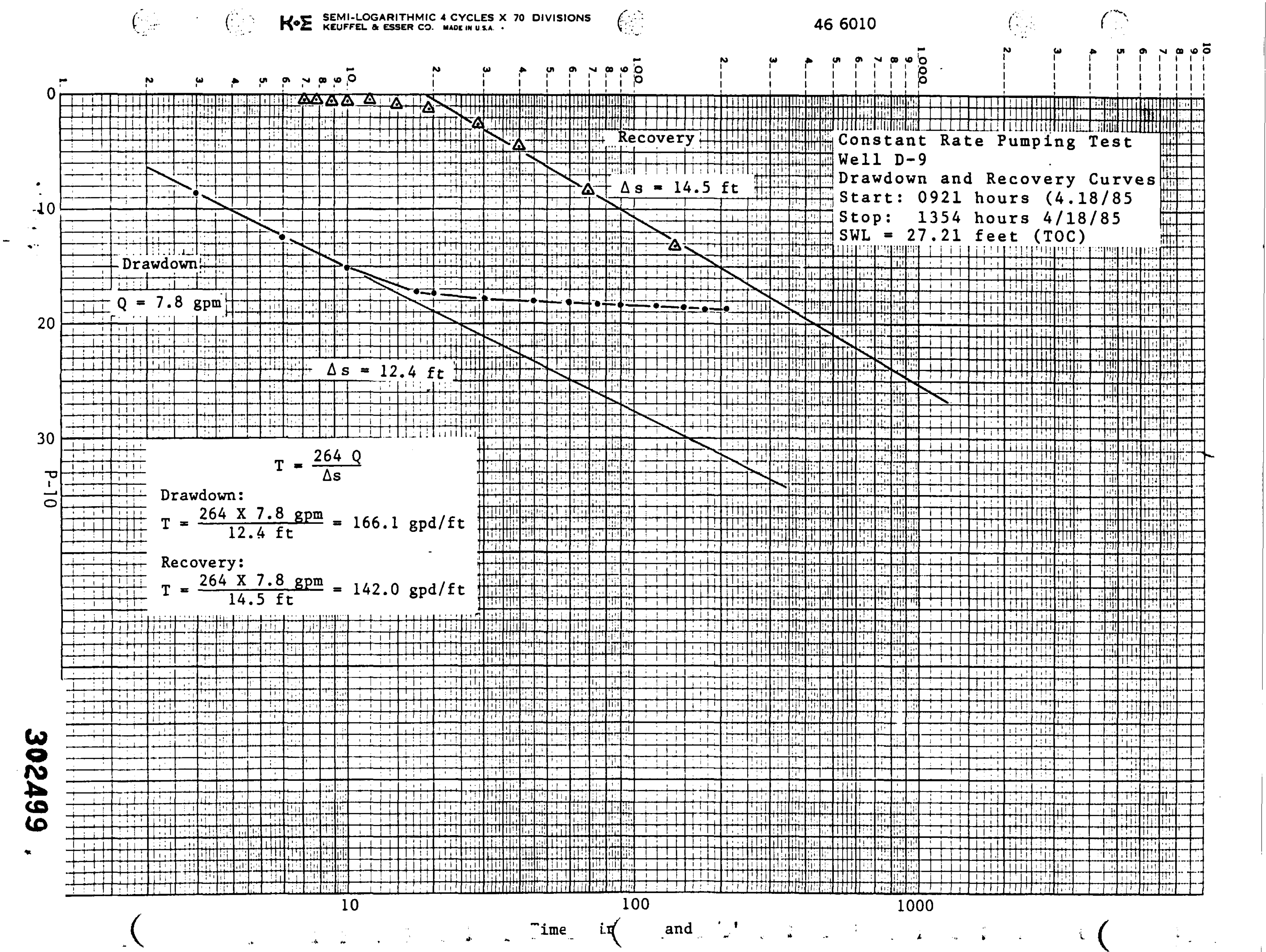


302497

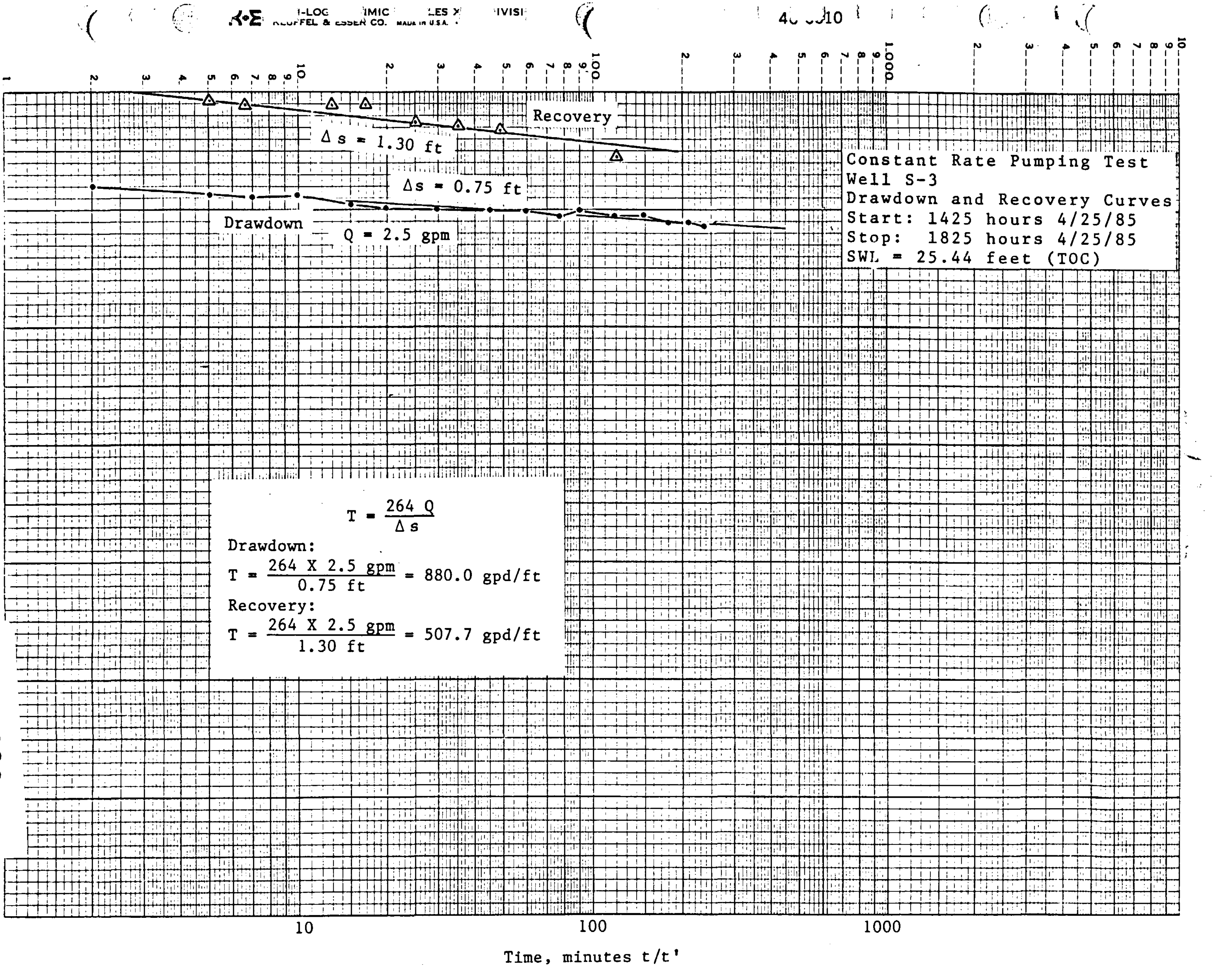


Time, minutes, and t/t'

302498



K•E SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 6010
Recovery
Δs = 14.5 ft
Constant Rate Pumping Test
Well D-9
Drawdown and Recovery Curves
Start: 0921 hours (4.18/85
Stop: 1354 hours 4/18/85
SWL = 27.21 feet (TOC)
Drawdown
Q = 7.8 gpm
Δs = 12.4 ft
T = 264 Q / Δs
Drawdown:
T = 264 X 7.8 gpm / 12.4 ft = 166.1 gpd/ft
Recovery:
T = 264 X 7.8 gpm / 14.5 ft = 142.0 gpd/ft
0
10
20
30
10
100
1000
Time in and
P-10
302499


K+E KEUFFEL & ESSER CO. MADE IN U.S.A.
Recovery
Δ s = 1.30 ft
Δs = 0.75 ft
Drawdown
Q = 2.5 gpm
Constant Rate Pumping Test
Well S-3
Drawdown and Recovery Curves
Start: 1425 hours 4/25/85
Stop: 1825 hours 4/25/85
SWL = 25.44 feet (TOC)
T = 264 Q / Δ s
Drawdown:
T = 264 X 2.5 gpm / 0.75 ft = 880.0 gpd/ft
Recovery:
T = 264 X 2.5 gpm / 1.30 ft = 507.7 gpd/ft
0
5
10
15
10
100
1000
Time, minutes t/t'

P-11

302500

APPENDIX Q

SLUG TEST ANALYSES

Project Name Coml. Fill South Project Number 8455

Well Number S-1 Date 4/17/85 Time ______ By [illegible]

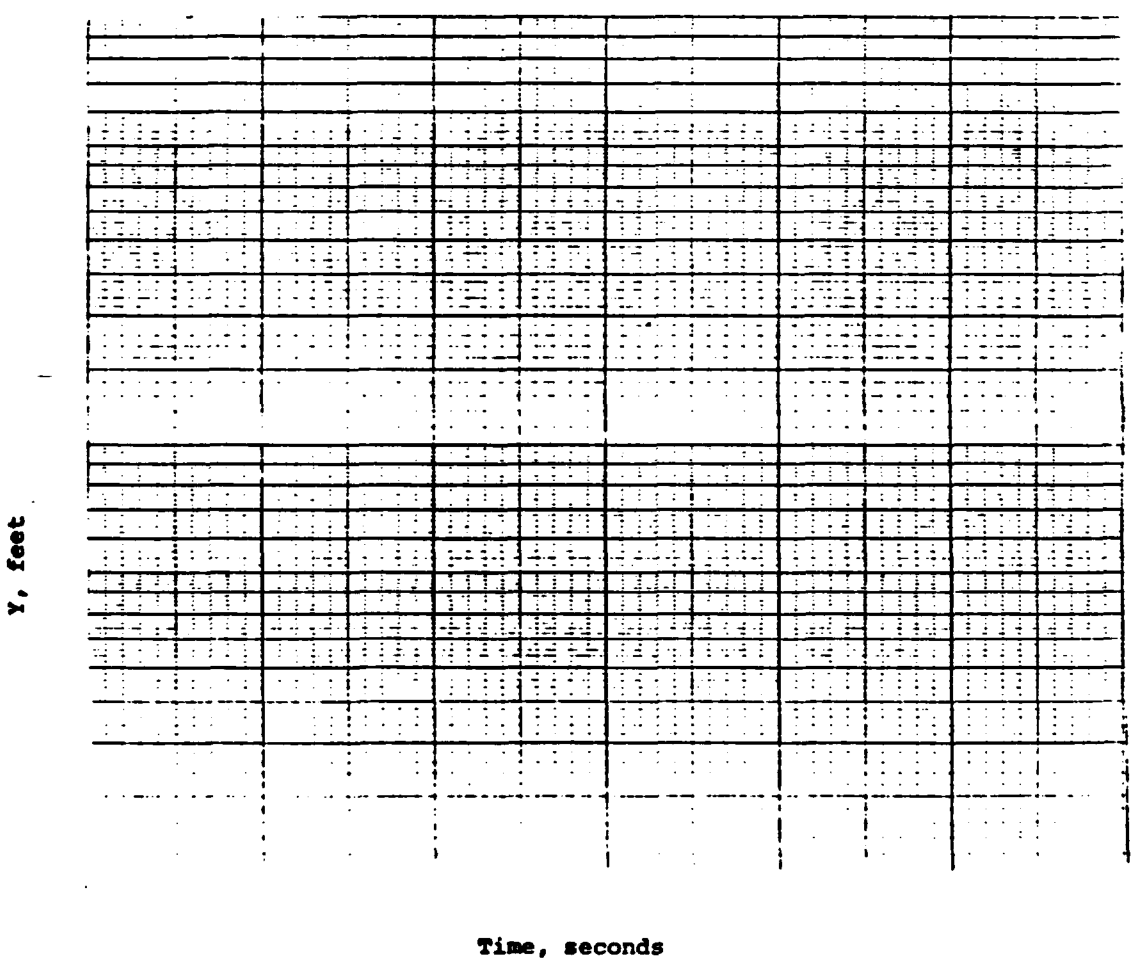
Well Data

1)	Total well depth	24'	TOC/GL
2)	SWL	5.79 / 3.61	TOC/GL
3)	1-2 (H)	20.39'	
4)	Effective well radius (r_w)	0.42'	
5)	Depth to bedrock	24'	TOC/GL
6)	Aquifer thickness (d) 5-2	20.39'	
7)	Casing stickup	2.38'	
8)	Screen setting	14' to 24'	TOC/GL
9)	Bottom of screen	24'	TOC/GL
10)	Screened aquifer interval (L) 8 or 9-2	10'	

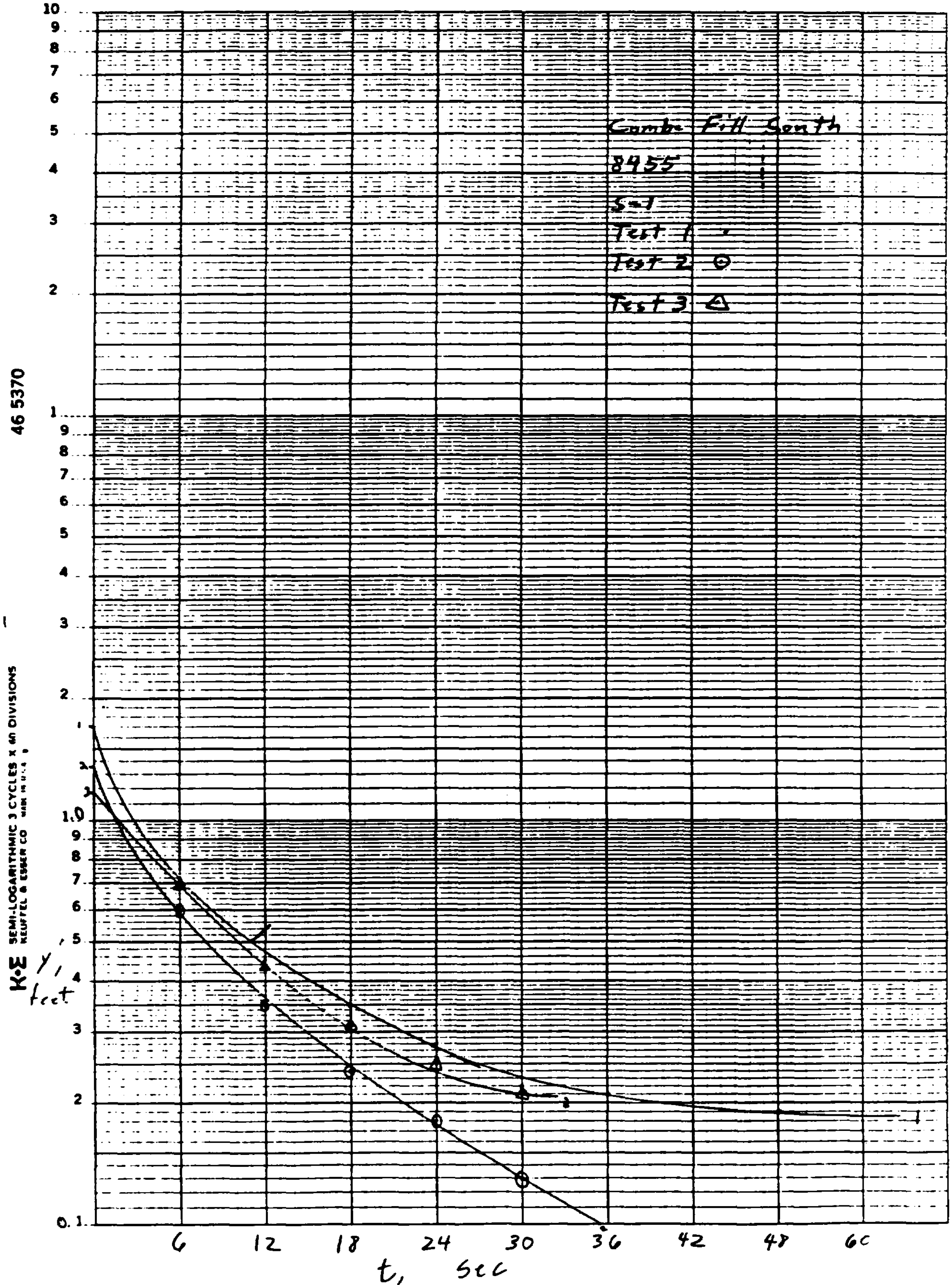
Slug Data

Radius of slug (r_s)	0.097'
Length of slug (h_s)	6.00'
Chart speed	2cm/min
Chart scale	1' = 1cm
Transducer depth	15.99'
Slug depth	6.25'
Transducer range	10 mV

Solution Method Bouwer + Rice 1976

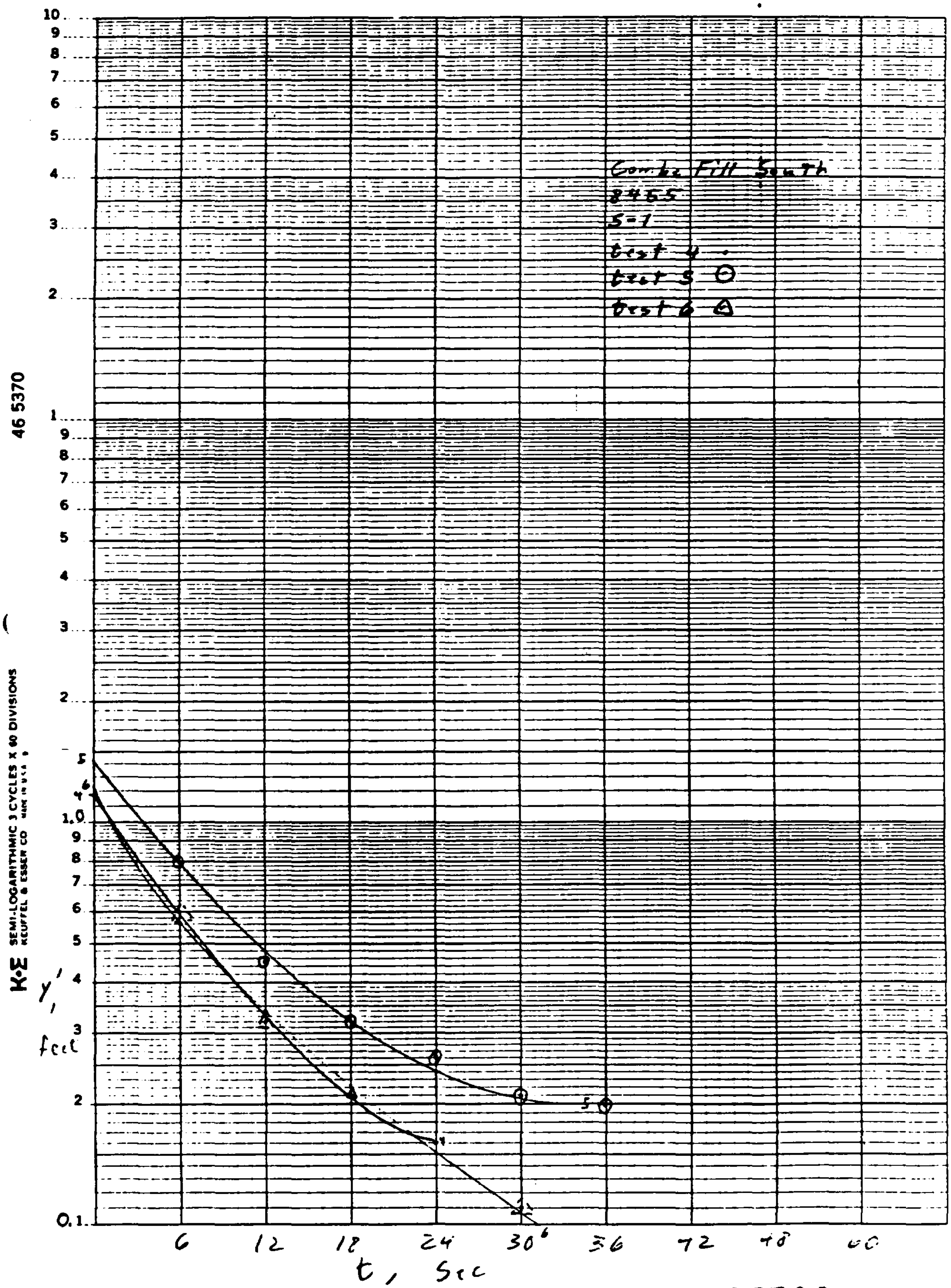


r.e. wright associates, inc. 302502



Combe Fill South
8455
S-1
Test 1
Test 2
Test 3
y, feet
t, sec
6
12
18
24
30
36
42
48
60
10
1
1.0
0.1
K+E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5370

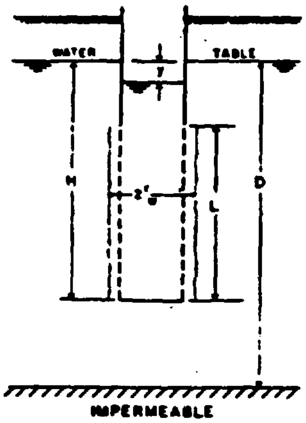
302503


Combe Fill South
8455
S-1
test 4 •
test 5 ⊙
test 6 △
y', feet
t, sec
K·E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO.
46 5370

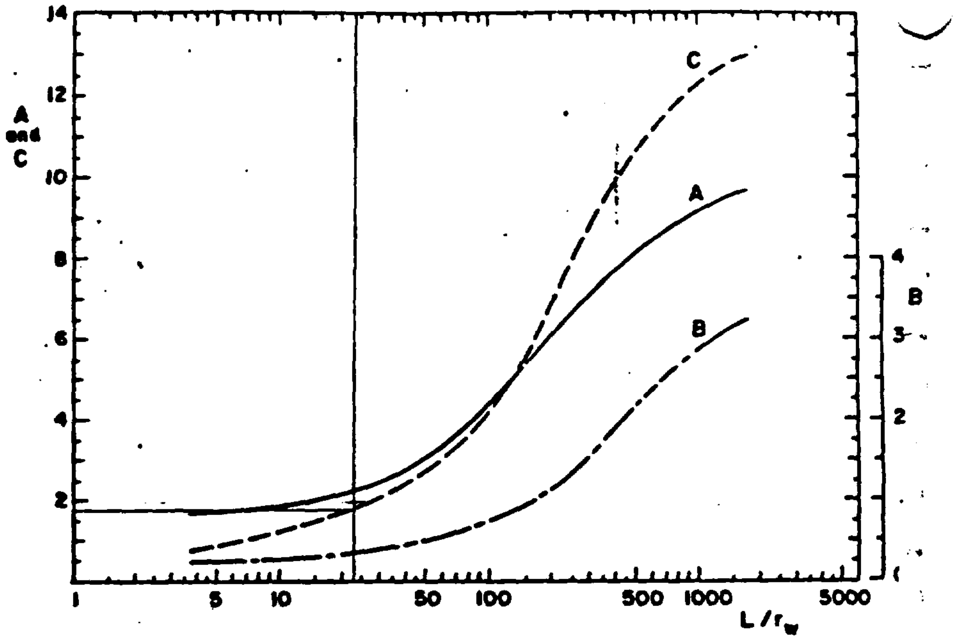
302504

Project Number 8455

Well Number 5-1



Geometry and symbols of a partially penetrating, partially perforated well in unconfined aquifer with gravel pack or developed zone around perforated section



Curves relating coefficients A, B, and C to L/r_w

D = 20.39

L = 10.0'

H = 20.39'

r_w = 0.42

r_s = 0.097

h_s = 6.00'

L/rw = 23.8 ; A = ______ ; B = ______ ; C = 1.8

$\ln\{(D-H)/r_w\}$ = ______ (max 6.0); if D=H, see*

$$\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{A+B \times \ln\{(D-H)/r_w\}}{L/r_w}\right\}^{-1} = \_\_\_\_\_\_$$

$$^*\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right\}^{-1} = 2.79$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} \cdot \frac{1}{t}\ln(Y_o/Y_t)$$

Test	t	Y_t	Y_o	r_c (1)	$\frac{1}{t}\ln(Y_o/Y_t)$	K ft/sec	Kgpd/ft² (2)
1	11.00	0.50	1.70	0.1822	0.1113	5.146×10^{-4}	3.326×10^{2}
2	14.00	0.32	1.35	0.2045	0.1028	5.990×10^{-4}	3.871×10^{2}
3	16.00	0.34	1.18	0.2187	0.0778	5.183×10^{-4}	3.349×10^{2}
4	14.00	0.28	1.18	0.2187	0.1027	6.847×10^{-4}	4.425×10^{2}
5	17.00	0.34	1.42	0.1994	0.0841	4.657×10^{-4}	3.009×10^{2}

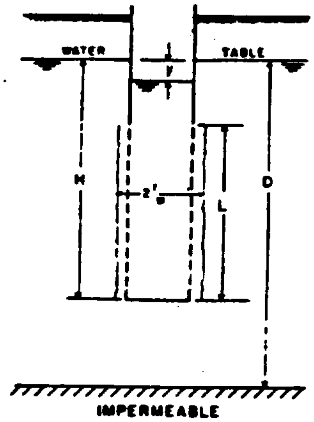
(1) $r_c = \left(\frac{r_s^2 h_s}{Y_o}\right)^{\frac{1}{2}}$

(2) Multiply ft/sec x 646,272 = gpd/ft²

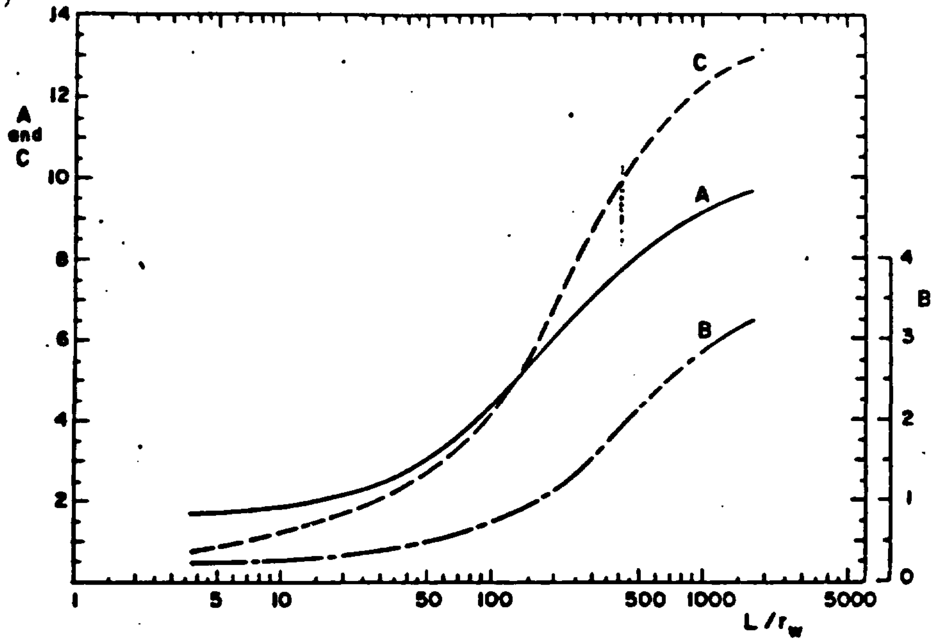
r.e. wright associates, inc.

Project Number 8455

Well Number S-1 (con't)



Geometry and symbols of a partially penetrating, partially perforated well in unconfined aquifer with gravel pack or developed zone around perforated section.



Curves relating coefficients *A*, *B*, and *C* to L/r_w

D = ______

L = ______

H = ______

r_w = ______

r_s = ______

h_s = ______

L/r_w = ____; A = ____; B = ____; C = ____

$\ln\{(D-H)/r_w\}$ = ____ (max 6.0); if D=H, see*

$$\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{A+B \times \ln\{(D-H)/r_w\}}{L/r_w}\right\}^{-1} = \_\_\_\_$$

$$*\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right\}^{-1} = \_\_\_\_$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} \cdot \frac{1}{t}\ln(Y_o/Y_t)$$

Test	t	Y	Y_o	r_c (1)	$\frac{1}{t}\ln(Y_o/Y_t)$	K ft/sec	Kgpd/ft^2 (2)
6	12.00	0.34	1.23	0.2142	0.1072	6.851×10^{-4}	4.427×10^2
GEOMETRIC AVERAGE							3.738×10^2

(1) $r_c = \left(\frac{r_s^2 h_s}{Y_o}\right)^{1/2}$

(2) Multiply ft/sec x 646,272 = gpd/ft^2

r.e. wright associates, inc.

302506

Project Name Combe Fill South Project Number 8455

Well Number S-2 Date 4/17/85 Time ______ By MVS

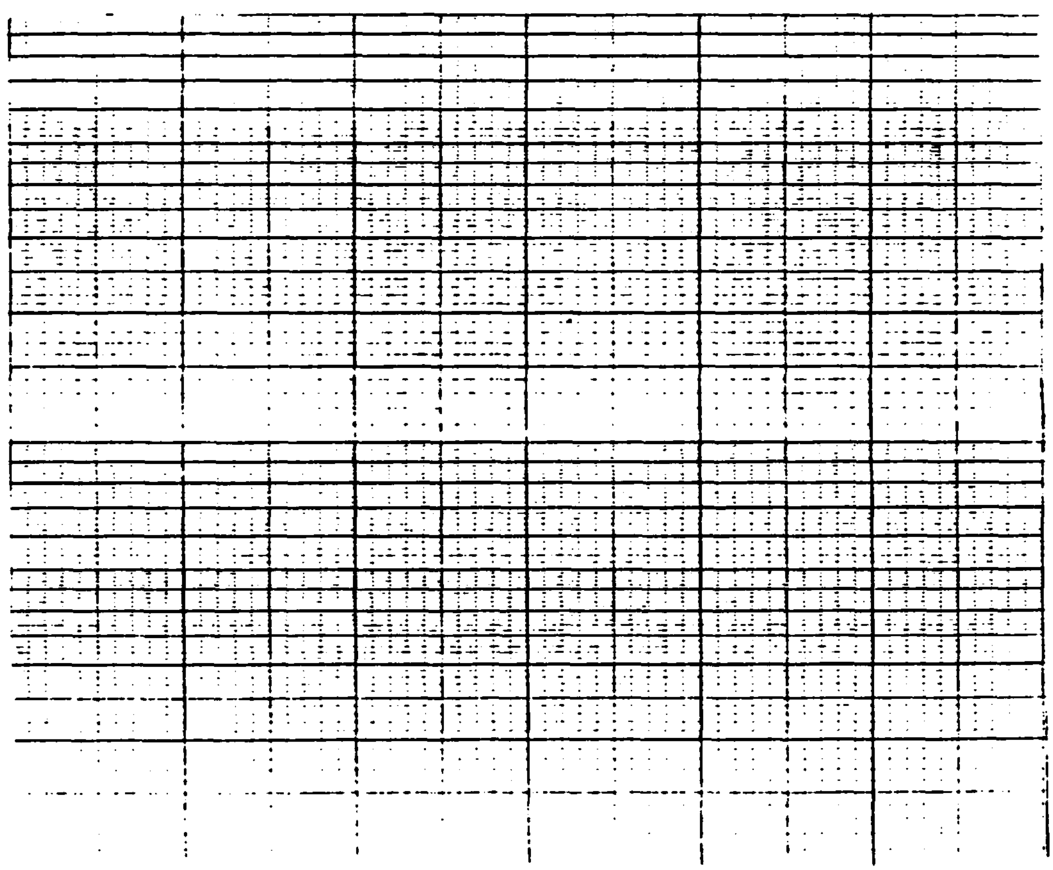
Well Data

1) Total well depth 51' TOC/GL
2) SWL 19.55'/17.68' TOC/GL
3) 1-2 (H) 33.32'
4) Effective well radius (r_w) 0.42'
5) Depth to bedrock 62.5' TOC/GL
6) Aquifer thickness (d) 5-2 34.82'
7) Casing stickup 1.87'
8) Screen setting 41' to 51' TOC/GL
9) Bottom of screen 51' TOC/GL
10) Screened aquifer interval (L) 8 or 9-2 10.0'

Slug Data

Radius of slug (r_s) 0.077'
Length of slug (h_s) 6.00'
Chart speed 1 cm/min
Chart scale 1' = 1 cm
Transducer depth 29.55'
Slug depth 19.75'
Transducer range 10 mV

Solution Method B + R

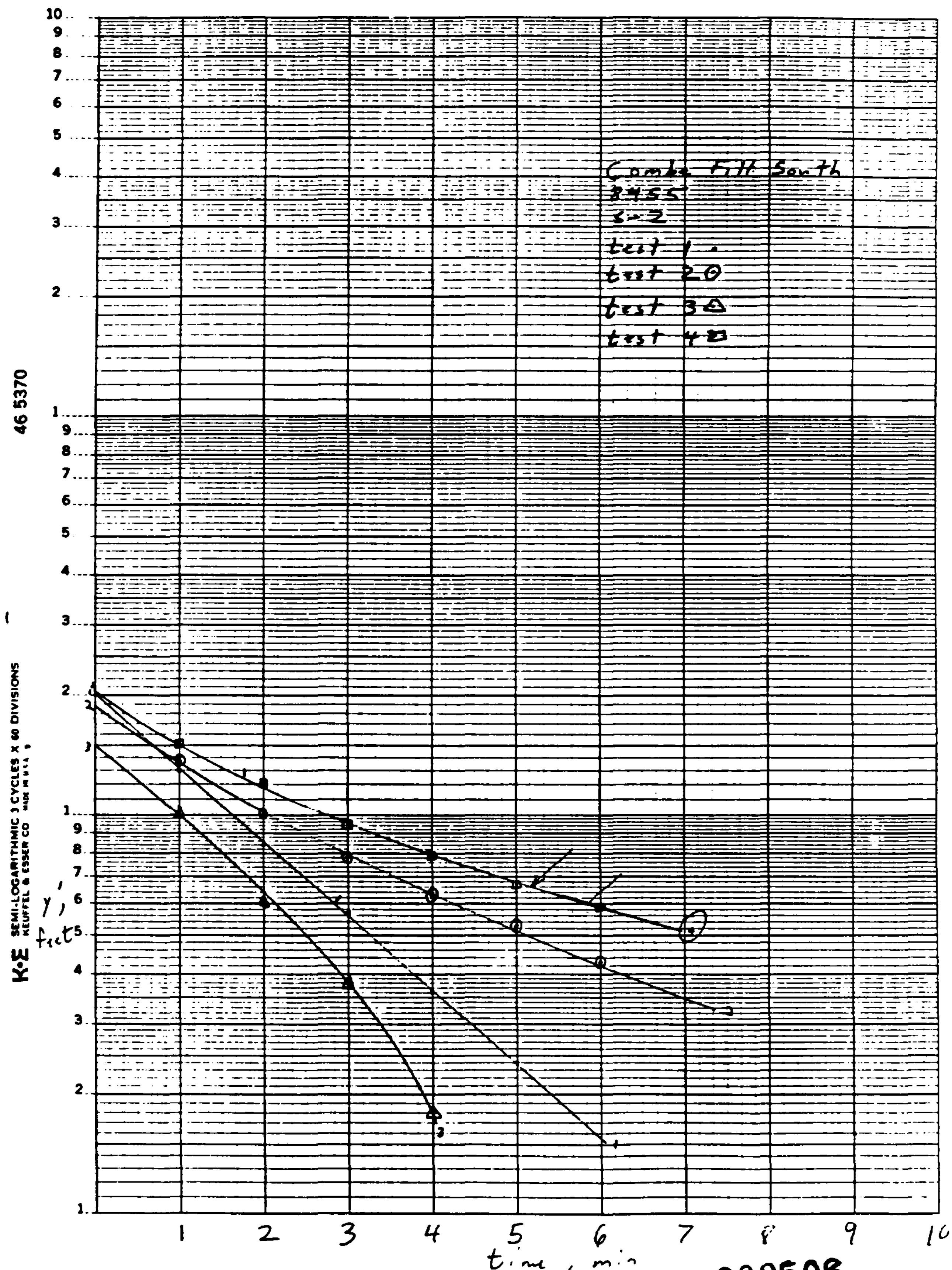


Y, feet

Time, seconds

r.e. wright associates, inc.

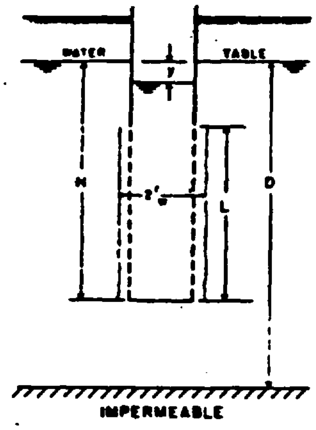
302507


Combe Fill South
8455
s-2
test 1 •
test 2 O
test 3 △
test 4 ⊠
y', ft
time, min
K•E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5370

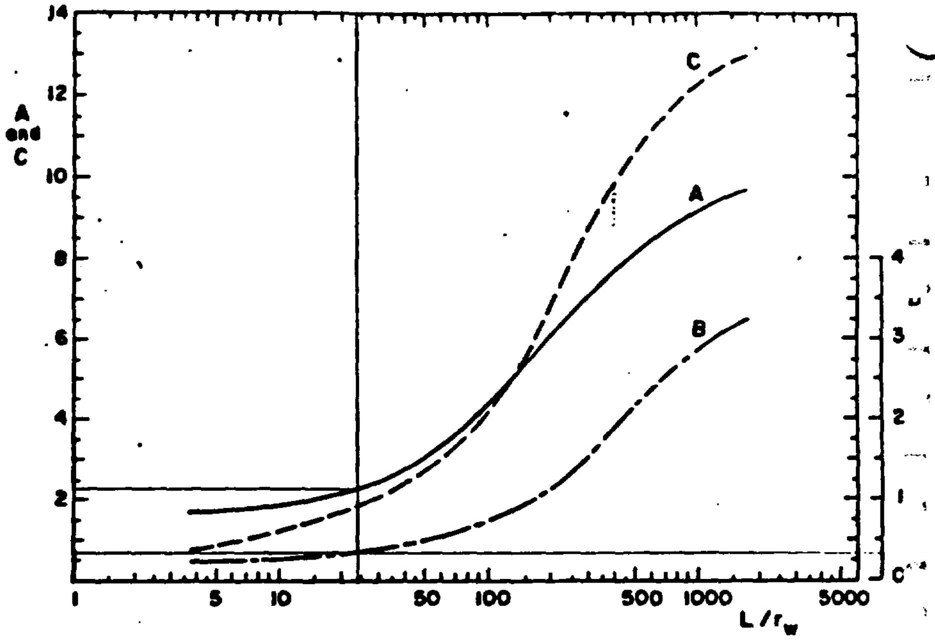
302508

Project Number 8455

Well Number S-2



Geometry and symbols of a partially penetrating, partially perforated well in unconfined aquifer with gravel pack or developed zone around perforated section



Curves relating coefficients *A*, *B*, and *C* to L/r_w

D = 34.82'
L = 10.0'
H = 33.32'
r_w = 0.42'
r_s = 0.097'
h_s = 6.00'

L/r_w = 23.8 ; A = 2.3 ; B = 0.3 ; C = ______

$\ln\{(D-H)/r_w\}$ = 1.50 (max 6.0); if D=H, see*

$$\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{A + B \times \ln\{(D-H)/r_w\}}{L/r_w}\right\}^{-1} = 2.75$$

$${}^{*}\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right\}^{-1} = \text{______}$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} \cdot \frac{1}{t}\ln(Y_o/Y_t)$$

Test	t	Y_t	Y_o	r_c (1)	$\frac{1}{t}\ln(Y_o/Y_t)$	K ft/sec	Kgpd/ft^2 (2)
1	170	0.60	2.00	0.1680	0.0071	2.745×10^{-5}	1.774×10^{1}
2	220	0.66	1.88	0.1733	0.0048	1.962×10^{-5}	1.268×10^{1}
3	170	0.42	1.50	0.1740	0.0075	3.869×10^{-5}	2.501×10^{1}
4	310	0.66	2.04	0.1664	0.0036	1.373×10^{-5}	8.931×10^{0}
GEOMETRIC AVERAGE							1.497×10^{1}

(1) $r_c = \left(\frac{r_s^2 h_s}{Y_o}\right)^{\frac{1}{2}}$

(2) Multiply ft/sec x 646,272 = gpd/ft^2

r.e. wright associates, inc.

302509

Project Name Coke Fill South Project Number D455

Well Number S-4 Date 4/17/85 Time ______ By MJS

Well Data

1) Total well depth 42' TOC/GL
2) SWL 12.59'/10.35' TOC/GL
3) 1-2 (H) 31.65'
4) Effective well radius (r_w) 0.42'
5) Depth to bedrock ______ TOC/GL
6) Aquifer thickness (d) 5-2 31.65'
7) Casing stickup 2.24'
8) Screen setting 32' to 42' TOC/GL
9) Bottom of screen 42' TOC/GL
10) Screened aquifer interval (L) 8 or 9-2 10.0'

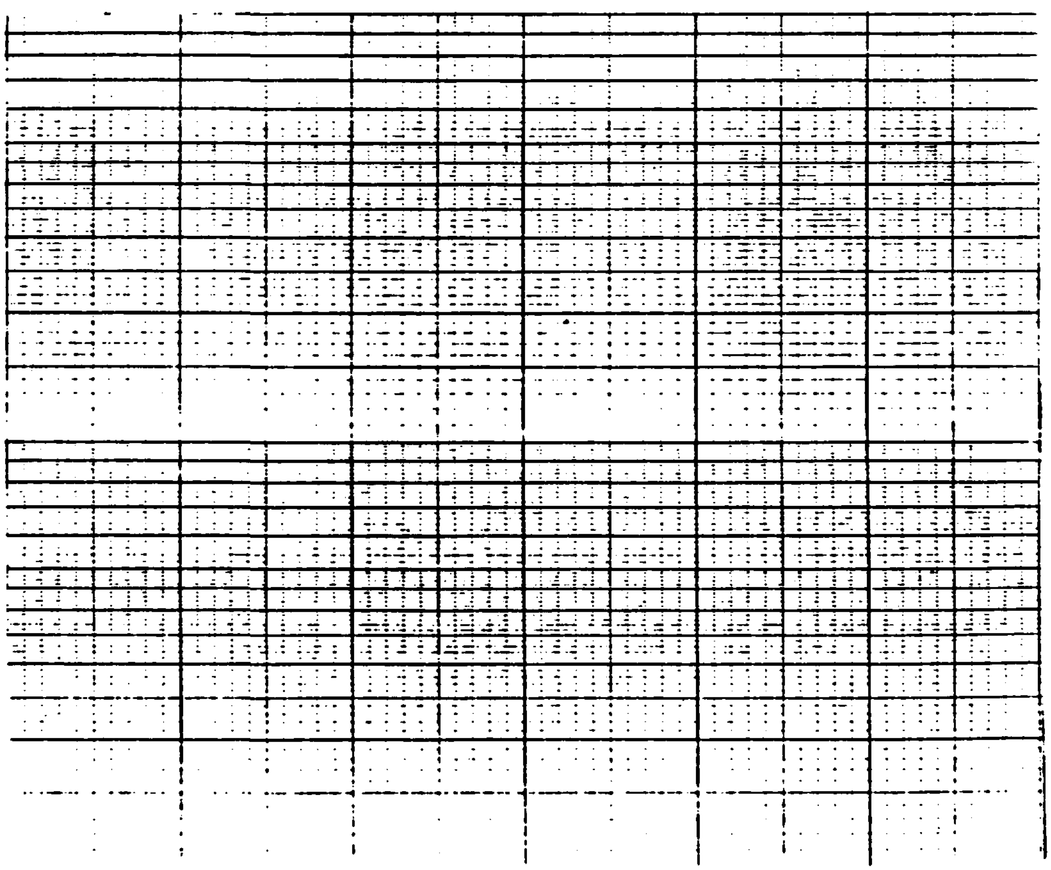
Slug Data

Radius of slug (r_s) 0.097'
Length of slug (h_s) 6.00'
Chart speed 2 cm/min
Chart scale 1' = 1 cm
Transducer depth 22.70'
Slug depth 12.70'
Transducer range 10 mV

test 1 2cm/min & 10cm/hr
test 2 0.5cm/min
" 3 " / "
" 4 " / "

Solution Method Bouwer + Rice

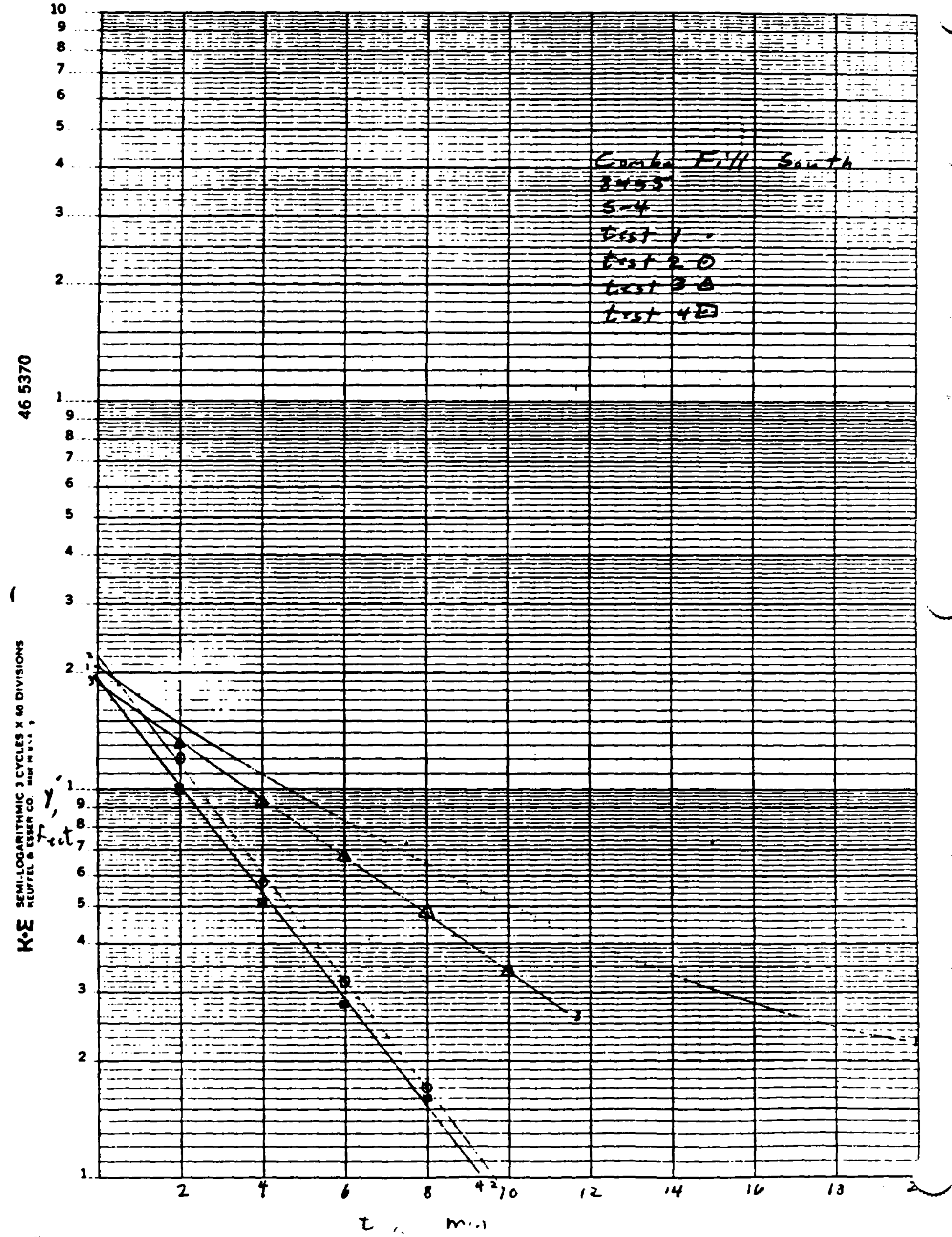
Y, feet



Time, seconds

r.e. wright associates, inc.

302510

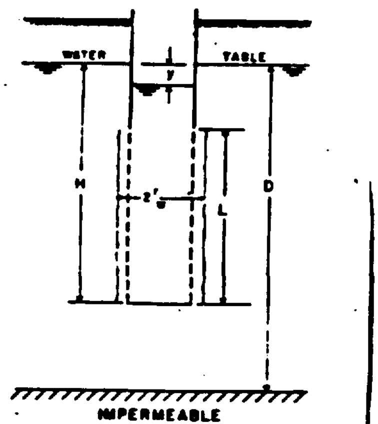


Combo Fill South
3455
S-4
test 1 •
test 2 ⊙
test 3 △
test 4 ⊡
y, feet
t, min
K·E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO.
46 5370

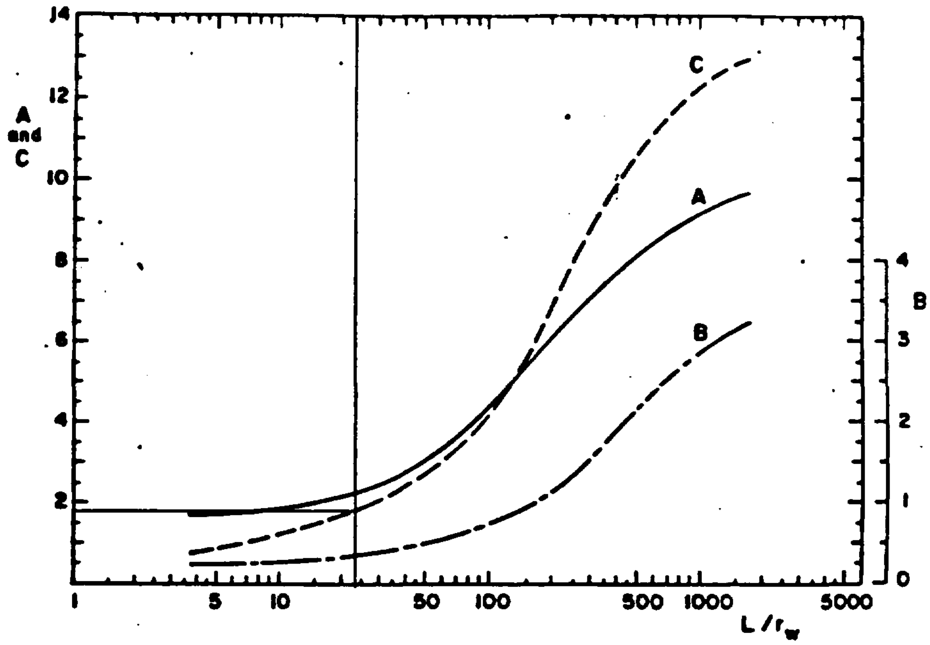
302511

Project Number 8455

Well Number S-4



Geometry and symbols of a partially penetrating, partially perforated well in unconfined aquifer with gravel pack or developed zone around perforated section



Curves relating coefficients A, B, and C to L/r_w

D = 31.65'
L = 10.00'
H = 31.65'
r_w = 0.42'
r_s = 0.097'
h_s = 6.00'

L/r_w = 23.8; A = ____; B = ____; C = 1.8

$\ln\{(D-H)/r_w\}$ = ____ (max 6.0); if D=H, see*

$$\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{A + B \times \ln\{(D-H)/r_w\}}{L/r_w}\right\}^{-1} = \_\_\_\_$$

$$*\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right\}^{-1} = 3.03$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} * \frac{1}{t}\ln(Y_o/Y_t)$$

Test	t	Y	Y_o	r_c (1)	$\frac{1}{t}\ln(Y_o/Y_t)$	K ft/sec	Kgpd/ft^2 (2)
1	279.6	1.00'	2.08'	0.1647	0.0026	1.077×10^{-5}	6.959×10^{0}
2	180.0	0.84'	2.20'	0.1602	0.0053	$2.07? \times 10^{-5}$	1.344×10^{1}
3	219.6	1.00'	~~4~~1.89'	0.1727	0.0029	1.311×10^{-5}	8.475×10^{0}
4	219.6	0.60'	1.91'	0.1719	0.0053	2.360×10^{-5}	1.526×10^{1}
GEOMETRIC AVERAGE							1.048×10^{1}

(1) $r_c = \left(\frac{r_s^2 h_s}{Y_o}\right)^{\frac{1}{2}}$

(2) Multiply ft/sec x 646,272 = gpd/ft^2

r.e. wright associates, inc.

302512

Project Name Combe Fill South Project Number 8455

Well Number S-5 Date 4/19/85 Time ______ By mjd

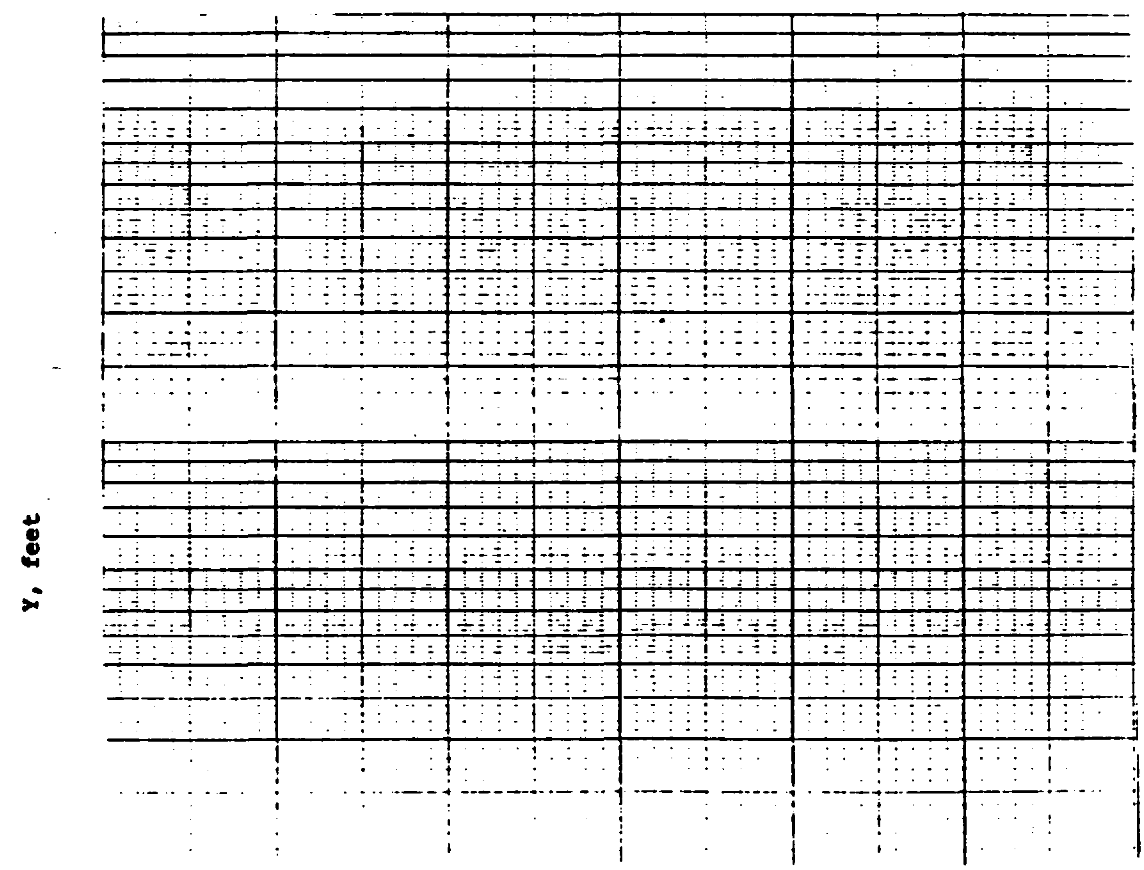
Well Data very windy

1) Total well depth 29.0′ TOC/GL
2) SWL 7.12′ / 5.06′ TOC/GL
3) 1-2 (H) 23.94′
4) Effective well radius (r_w) 0.42
5) Depth to bedrock 29′ TOC/GL
6) Aquifer thickness (d) 5-2 23.94′
7) Casing stickup 2.76′
8) Screen setting 19 - 29′ TOC/GL
9) Bottom of screen 29′ TOC/GL
10) Screened aquifer interval (L) 8 or 9-2 10′

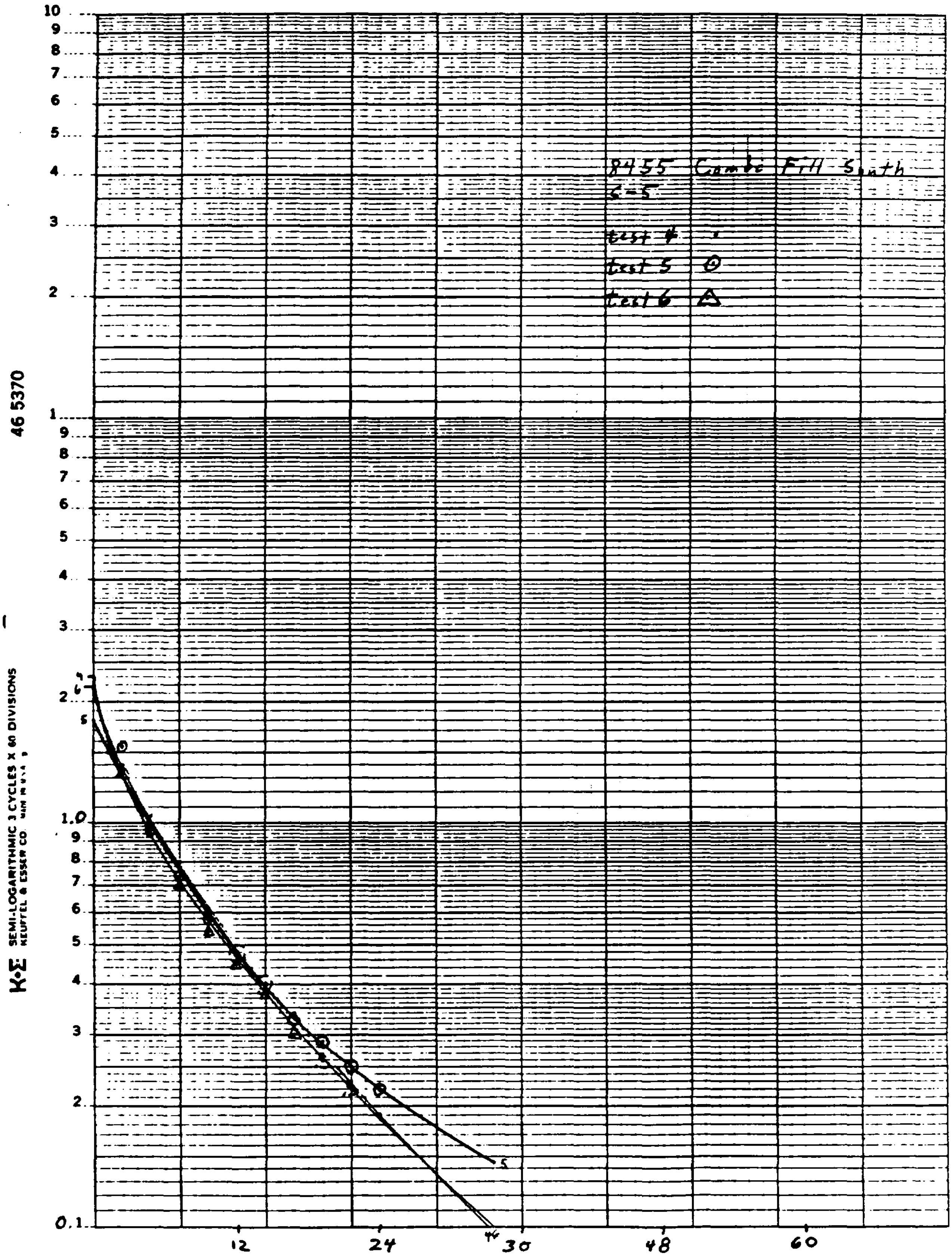
Slug Data

Radius of slug (r_s) 0.097′
Length of slug (h_s) 6.00′
Chart speed 5 cm/min
Chart scale 1′ = 1 cm
Transducer depth 17.82′
Slug depth 7.0′
Transducer range 10 mV

Solution Method Bouwer + Rice

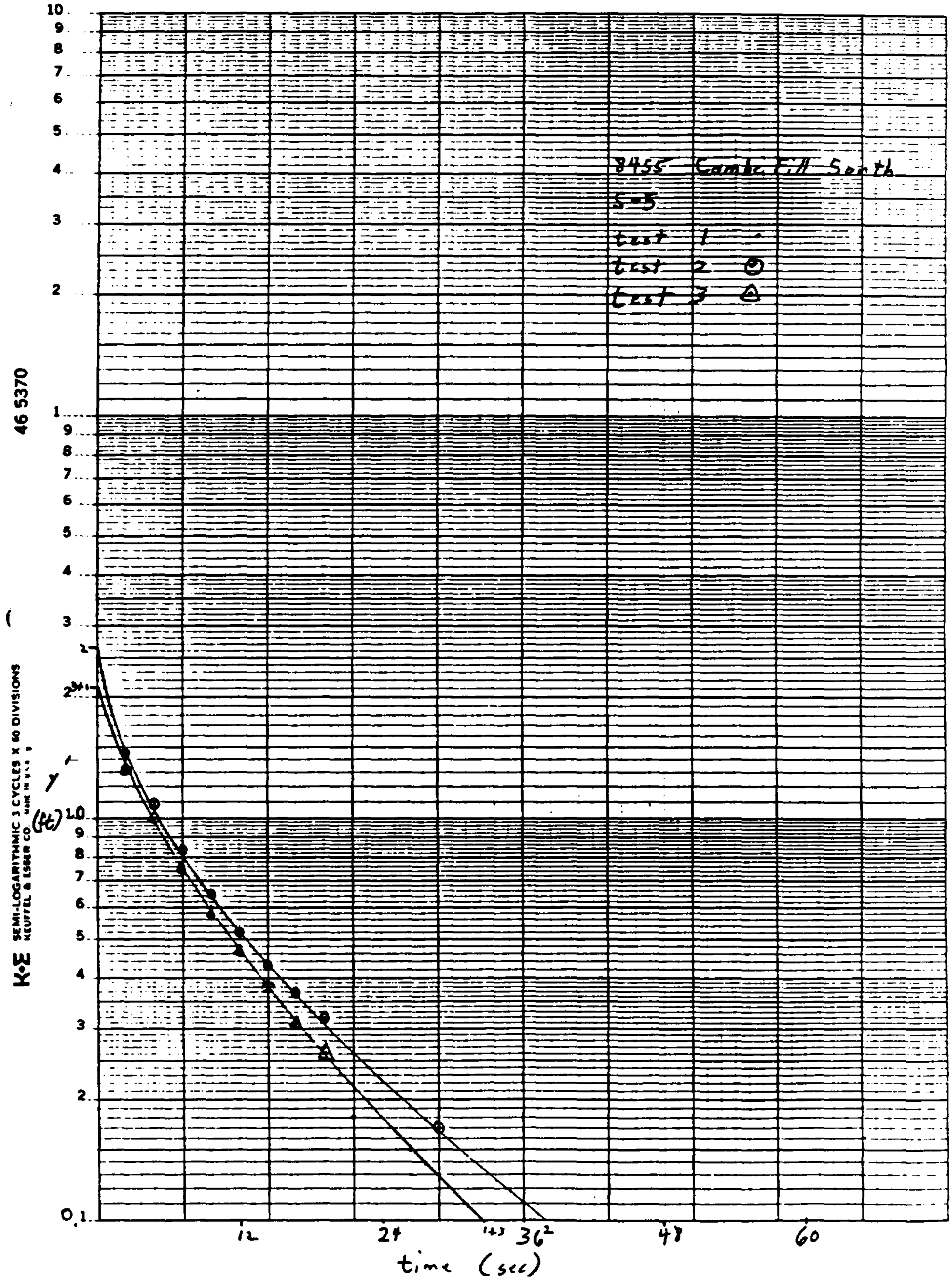


r.e. wright associates, inc. 302513



8455 Combo Fill South
C-5
test 4 •
test 5 ⊙
test 6 △
K•E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO.
46 5370
12
24
30
48
60

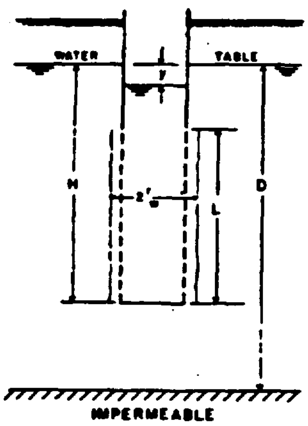
302514


8455 Combo Fill South
S=5
test 1 •
test 2 ⊙
test 3 △
y (ft)
time (sec)
K•E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO.
46 5370

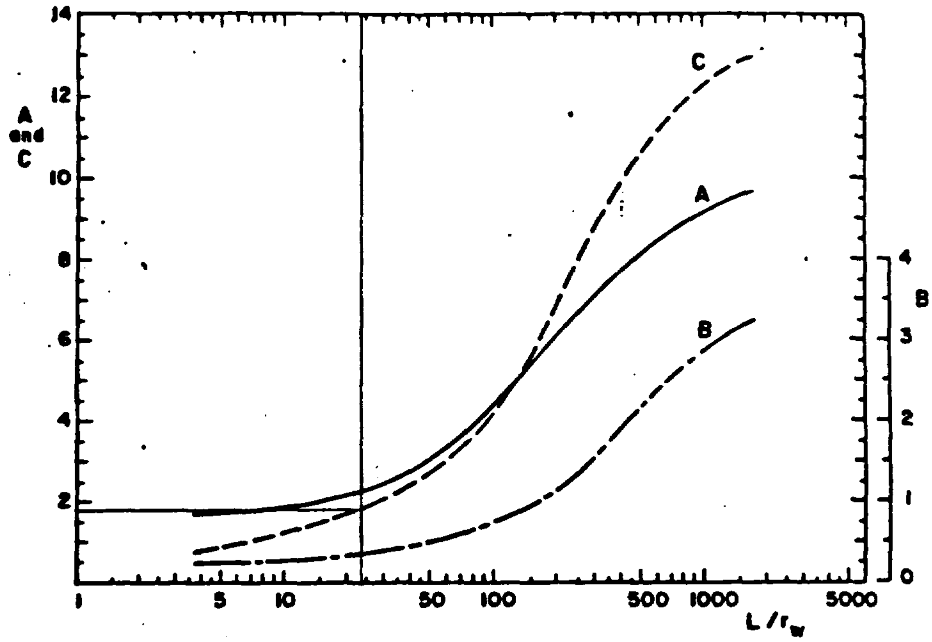
302515

Project Number 8455

Well Number 5-5



Geometry and symbols of a partially penetrating, partially perforated well in unconfined aquifer with gravel pack or developed zone around perforated section



Curves relating coefficients *A*, *B*, and *C* to L/r_w

D = 23.94'
L = 10'
H = 23.94'
r_w = 0.42'
r_s = 0.097'
h_s = 6.00'

L/r_w = 23.8; A = ____; B = ____; C = 1.80

$\ln\{(D-H)/r_w\}$ = ____ (max 6.0); if D=H, see*

$$\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{A+B\times\ln\{(D-H)/r_w\}}{L/r_w}\right\}^{-1} = \_\_\_\_$$

$$^*\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right\}^{-1} = 2.88$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} \cdot \frac{1}{t}\ln(Y_o/Y_t)$$

Test	t	Y	Y_o	r_c (1)	$\frac{1}{t}\ln(Y_o/Y_t)$	K ft/sec	Kgpd/ft² (2)
1	6.00	0.86	2.10	0.1646	0.1488	5.752×10^{-4}	3.717×10^{2}
2	18.00	0.26	2.65	0.1460	0.1290	3.951×10^{-4}	2.554×10^{2}
3	6.00	0.86	2.10	0.1640	0.1488	5.752×10^{-4}	3.717×10^{2}
4	16.80	0.40	2.30	0.1567	0.1041	3.675×10^{-4}	2.375×10^{2}
5	19.20	0.33	1.80	0.1771	0.0884	3.985×10^{-4}	2.575×10^{2}

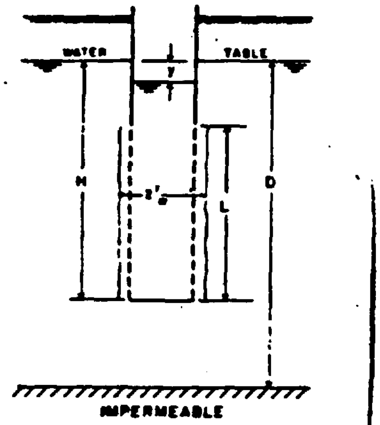
(1) $r_c = \left(\frac{r_s^2 h_s}{Y_o}\right)^{1/2}$

(2) Multiply ft/sec x 646,272 = gpd/ft²

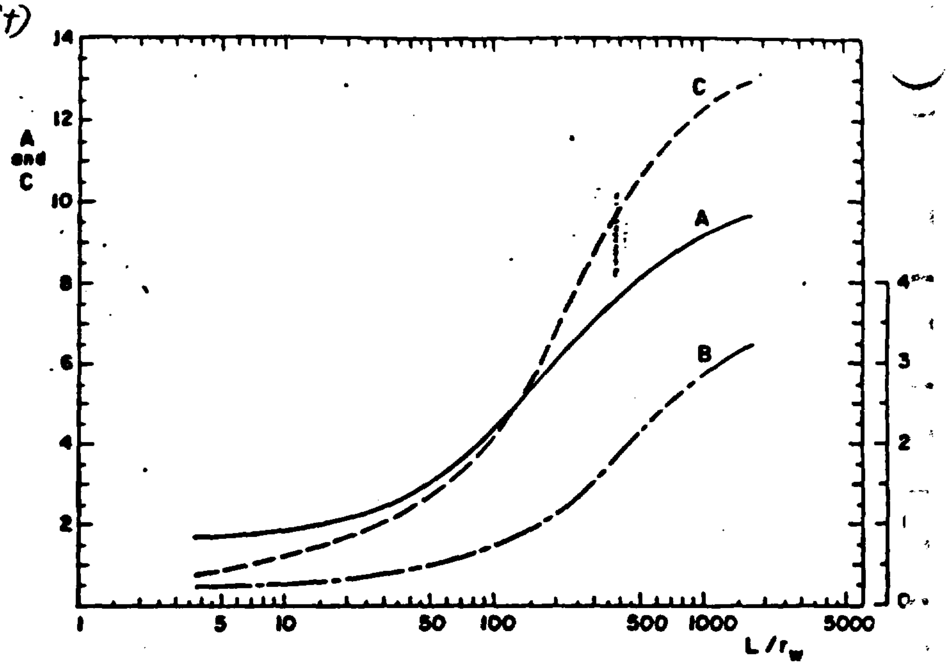
r.e. wright associates, inc. 302516

Project Number 8455

Well Number 5-5 (con't)



Geometry and symbols of a partially penetrating, partially perforated well in unconfined aquifer with gravel pack or developed zone around perforated section.



Curves relating coefficients *A*, *B*, and *C* to L/r_w.

D = ______

L = ______

H = ______

r_w = ______

r_s = ______

h_s = ______

L/r_w = ______ ; A = ______ ; B = ______ ; C = ______

$\ln\{(D-H)/r_w\}$ = ______ (max 6.0); if D=H, see*

$$\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{A+B \times \ln\{(D-H)/r_w\}}{L/r_w}\right\}^{-1} = \_\_\_\_\_\_$$

$$*\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right\}^{-1} = \_\_\_\_\_\_$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} \cdot \frac{1}{t} \ln(Y_o/Y_t)$$

Test	t	Y	Yo	r_c (1)	$\frac{1}{t}\ln(Y_o/Y_t)$	K ft/sec	Kgpd/ft² (2)
6	16.70	0.38	2.17	0.1613	0.1037	3.880×10^{-4}	2.507×10^{2}
GEOMETRIC AVERAGE							2.880×10^{2}

(1) $r_c = \left(\frac{r_s^2 h_s}{Y_o}\right)^{1/2}$

(2) Multiply ft/sec x 646,272 = gpd/ft²

r.e. wright associates, inc.

302517

Project Name Combe Fill South Project Number 8455

Well Number S-6 Date 4/19/85 Time ______ By MJS

Well Data

1) Total well depth 64' TOC/GL
2) SWL 26.62/23.91 TOC/GL
3) 1-2 (H) 40.09'
4) Effective well radius (r_w) 0.42'
5) Depth to bedrock 68.25' TOC/GL
6) Aquifer thickness (d) 5-2 44.34'
7) Casing stickup 2.71'
8) Screen setting 54' to 64' TOC/GL
9) Bottom of screen 64' TOC/GL
10) Screened aquifer interval (L) 8 or 9-2 10.0'

Slug Data

Radius of slug (r_s) 0.097'
Length of slug (l_s) 6.00'
Chart speed 1 cm/min
Chart scale 1' = 1 cm
Transducer depth 36.62'
Slug depth 26.70'
Transducer range 10 mV

test 2 Transducer messed up or Child moved line
test 3 still problem
test 4 OK

Solution Method ______

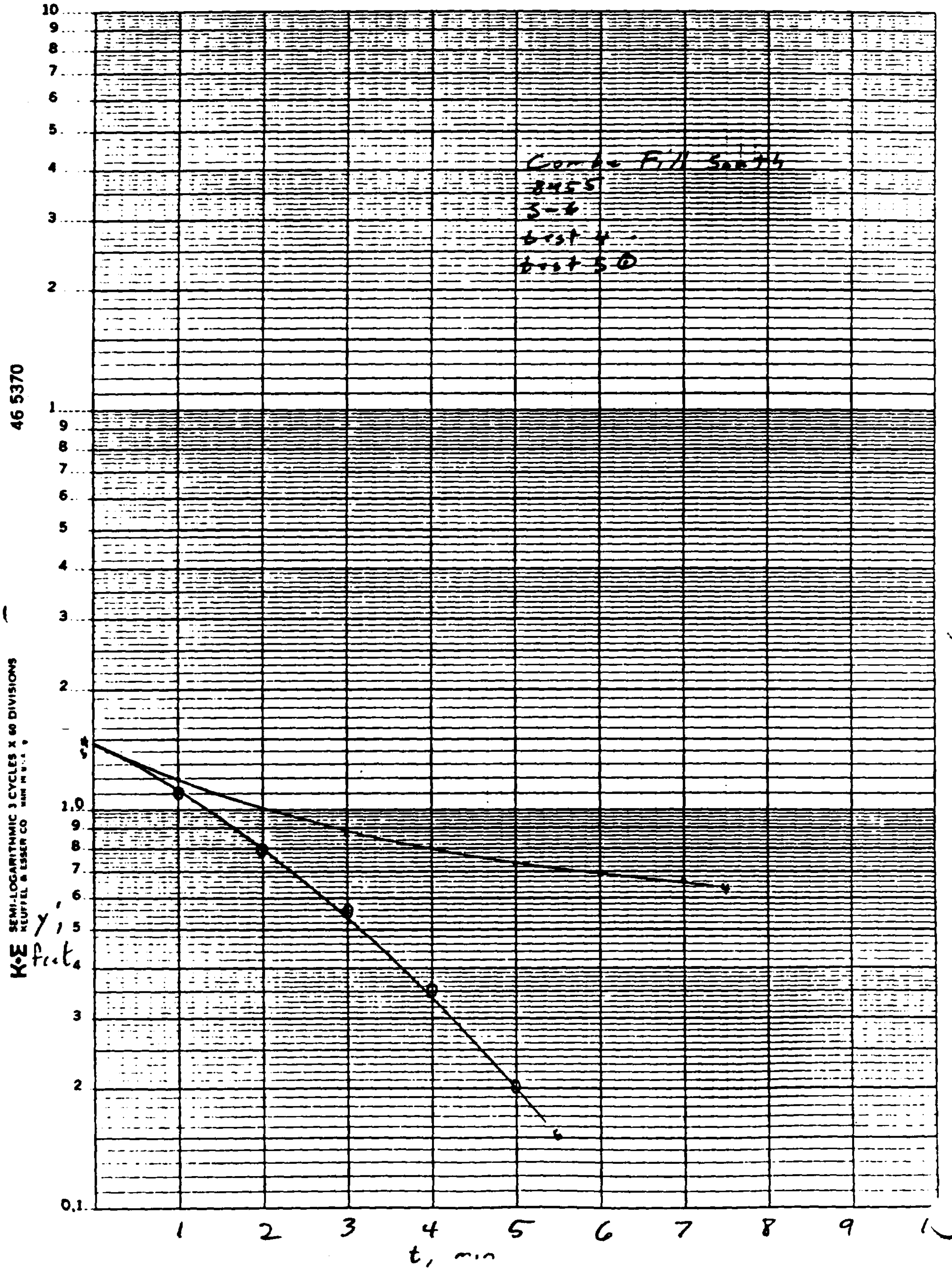
test 5 mystery SWL 26.66' end of test

Y, feet

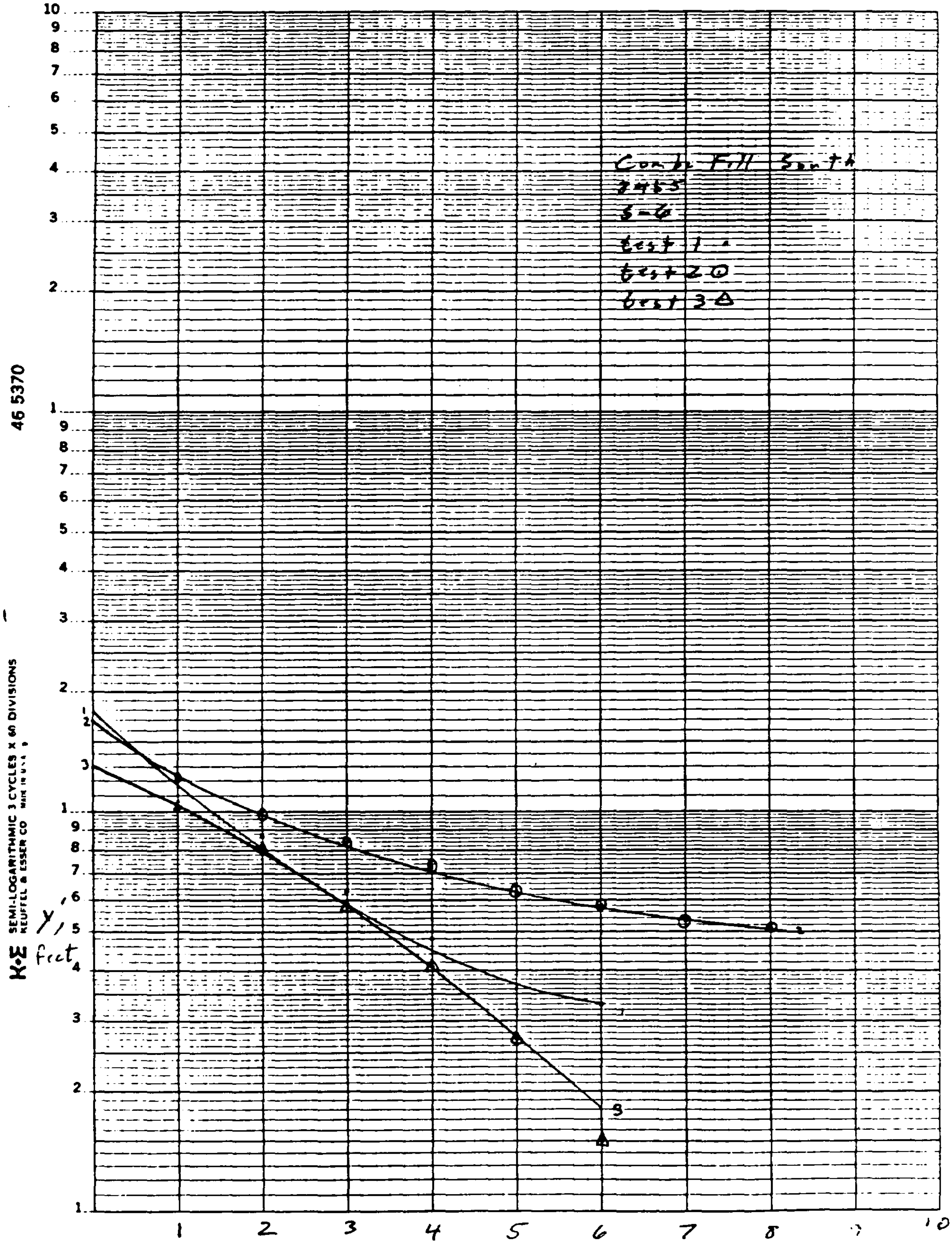
Time, seconds

r.e. wright associates, inc.

302518

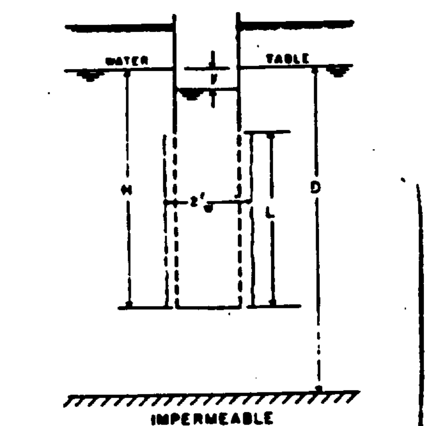

Combe Fill South
8455
3-6
best 4
best 5
46 5370
K-E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO
y', ft
t, min

302519

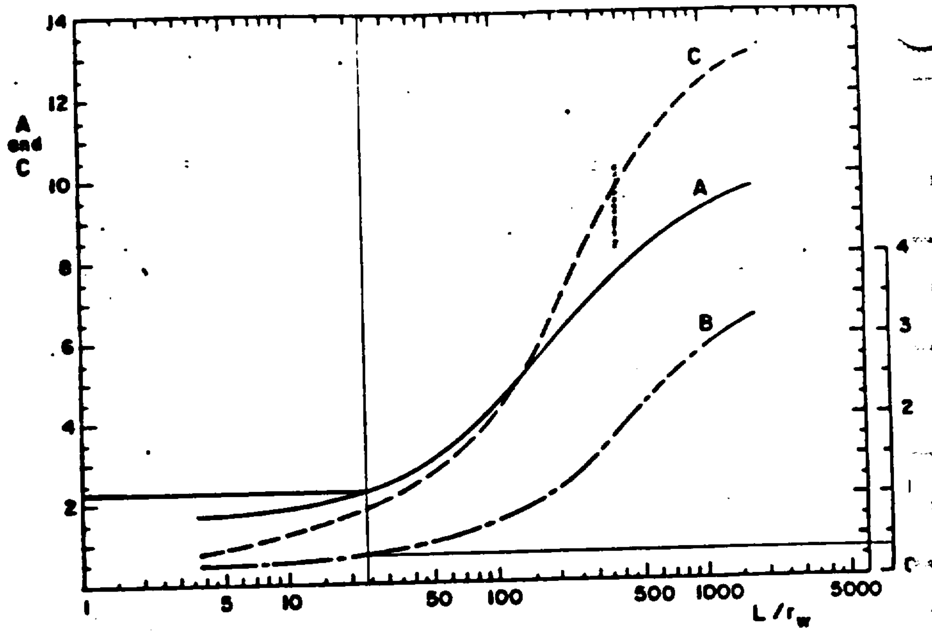

Comb. Fill South
3-6
test 1 •
test 2 ⊙
test 3 △
y, feet
46 5370
K·E SEMI-LOGARITHMIC 3 CYCLES X 60 DIVISIONS
KEUFFEL & ESSER CO.
1
2
3
4
5
6
7
8
10

Project Number 8455

Well Number S-6



Geometry and symbols of a partially penetrating, partially perforated well in unconfined aquifer with gravel pack or developed zone around perforated section



Curves relating coefficients A, B, and C to L/r_w

D = 44.34'
L = 10.00'
H = 40.09'
r_w = 0.42'
r_s = 0.097'
h_s = 6.00'

L/r_w = 23.8 ; A = 2.3 ; B = 0.3 ; C = ______

$\ln\{(D-H)/r_w\}$ = 2.31 (max 6.0); if D=H, see*

$$\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{A + B \times \ln\{(D-H)/r_w\}}{L/r_w}\right\}^{-1} = 2.72$$

$$*\ln(R_e/r_w) = \left\{\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right\}^{-1} = \_\_\_\_\_\_$$

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} * \frac{1}{t}\ln(Y_o/Y_t)$$

Test	t	Y	Y_o	r_c (1)	$\frac{1}{t}\ln(Y_o/Y_t)$	K ft/sec	Kgpd/ft^2 (2)
1	130.00	0.76	1.78	0.1781	0.0065	2.828×10^{-5}	1.828×10^{1}
2	190.00	0.80	1.69	0.1828	0.0039	1.791×10^{-5}	1.157×10^{1}
3	200.00	0.52	1.30	0.2084	0.0046	2.710×10^{-5}	1.751×10^{1}
4	150.00	0.94	1.47	0.1960	0.0030	1.559×10^{-5}	1.008×10^{1}
5	100.00	0.90	1.47	0.1960	0.0049	2.566×10^{-5}	1.658×10^{1}

GEOMETRIC AVERAGE – 1.440×10^{1}

(1) $r_c = \left(\frac{r_s^2 h_s}{Y_o}\right)^{\frac{1}{2}}$

(2) Multiply ft/sec x 646,272 = gpd/ft

r.e. wright associates, inc.

APPENDIX R

MANUFACTURE/USAGE
ORGANIC COMPOUNDS

Combe Fill South RI/FS

CHEMICAL COMPOUND	MANUFACTURE/USAGE
PRIORITY POLLUTANTS	
Volatiles	
Chloroform	Mfg fluorocarbon refrigerants and propellants and plastics Mfg anesthetics and pharmaceuticals Primary source for chlorodifluoromethane mfg Fumigant Solvent Mfg sweetener Fire extinguisher mfg Electronic circuitry mfg Analytical chemistry Insecticide
Trichlorofluoromethane	NA
1,1,1-Trichloroethane	NA
Methylene chloride	Paint stripping and solvent degreasing Mfg aerosols, photographic film, synthetic fibers Extraction of naturally-occurring heat sensitive substances Refrigerant in low-pressure refrigerators and air-conditioners Fumigant Solvent Textile and leather coatings Pharmaceutical Used in plastics processing Spotting agent Dewaxing Organic synthesis Blowing agent in foams
1,1-Dichloroethane	NA
Trichloroethane	Mfg 1,1-dichloroethylene Solvent for chlorinated rubber and various organic materials (fats, resins, oils, etc)

NA - Not available.

APPENDIX R

MANUFACTURE/USAGE
ORGANIC COMPOUNDS
(Page 2 of 7)

Combe Fill South RI/FS

CHEMICAL COMPOUND	MANUFACTURE/USAGE
Bromodichloromethane	Fire extinguisher fluid ingredient Solvent (fats, waxes, resins) Synthesis intermediate Heavy liquid for mineral and salt separations
Benzene	Mfg styrene, phenol, detergents, organic chemicals, pesticide, plastics and resins, synthetic rubber, aviation fuel, pharmaceuticals, dyes, explosives, PCB, gasoline, tanning, flavors, and perfumes, paints and coatings Nylon intermediates Food Processing Photographic chemicals
Chloroethane	NA
Dichlorofluoromethane	NA
Toluene	Mfg benzene derivatives, caprolactam, saccharin, medicines, dyes, perfumes, TNT Used in solvent recovery plants Component of gasoline Solvent for paints and coatings, gums, resins, rubber and vinyl organosols Diluent and thinner in nitrocellulose lacquers Adhesive solvent in plastic toys and models Detergent mfg Asphalt and naphtha constituent
Trans-1,2-Dichloroethylene	Solvent for fats, phenols, camphor, etc Retards fermentation Rubber mfg Refrigerant Additive to dye and lacquer solutions Low temperature solvent for heat sensitive substances (caffeine) Constituent of perfumes, thermoplastics Used in organic synthesis and medicine

NA - Not available.

APPENDIX R

MANUFACTURE/USAGE
ORGANIC COMPOUNDS
(Page 3 of 7)

Combe Fill South RI/FS

CHEMICAL COMPOUND	MANUFACTURE/USAGE
1,2-Dichloroethane	Mfg of vinyl chloride Mfg of tetraethyl lead Intermediate insecticidal fumigant Tobacco flavoring Constituent in soaps and scouring compounds, wetting and penetrating agents, varnish and finish removers, metal degreaser, and paints Used in chemical synthesis and ore flotation
Chlorobenzene	Used in solvent recovery plants Intermediate in dyestuffs mfg Mfg aniline, insecticides, phenol, chloronitrobenzene
Carbon Tetrachloride	Fire extinguisher mfg Dry cleaning operations Mfg of refrigerants, aerosols, and propellants Mfg of chlorofluoromethanes Extractant Solvent Veterinary medicine Metal degreasing Fumigant Chlorinating organic compounds
1,2-Dichloropropane	NA
Ethyl benzene	Styrene mfg Acetophenone mfg Solvent Asphalt constituent Naphtha constituent
Tetrachloroethylene	Dry cleaning operations Metal degreasing Solvents for fats, greases, waxes, rubber, gums, caffeine from coffee Remove soot from industrial boilers Mfg paint removers, printing ink Mfg trichloroacetic acid Heat transfer medium Mfg of fluorocarbons

NA - Not available.

APPENDIX R

MANUFACTURE/USAGE
ORGANIC COMPOUNDS

Combe Fill South RI/FS

CHEMICAL COMPOUND	MANUFACTURE/USAGE
Trichloroethylene	Dry cleaning operations and metal degreasing Solvents for fats, greases, waxes, caffeine from coffee Solvents for greases and waxes from cotton, wool, etc. Solvent for cellulose, ester, and ethers Solvent for dyeing Refrigerant and heat exchange liquid Organic synthesis Fumigant Anesthetic
ACID/PHENOLIC	
Pentachlorophenol	Mfg insecticides, algicides, herbicides, and fungicides Preservative of wood and wood products Mfg of sodium pentachlorophenate
Phenol	NA
BASE/NEUTRAL	
Di-n-butyl phthalate	Plasticizer mfg Plastics mfg recycling and processing Cosmetics Diluent in polysulfide dental impression materials Industrial stains mfg Explosive (propellant) component used in fuel matrix of double-base rocket propellant Textile lubricating agent Used in safety glass Insecticides Printing inks Paper coatings Adhesives
Bis(2-ethylhexyl) phthalate	Plasticizer mfg Plastics mfg recycling and processing Organic pump fluid

NA - Not available.

APPENDIX R

MANUFACTURE/USAGE
ORGANIC COMPOUNDS
(Page 5 of 7)

Combe Fill South RI/FS

CHEMICAL COMPOUND	MANUFACTURE/USAGE
Diethyl phthalate	Plasticizer mfg Plastics mfg and processing Explosive (propellant) component Suitable for food package application (FDA) Dye application agent Diluent in polysulfide dental impression materials Solvent Wetting agent Camphor substitute, perfumery, alcohol denaturant Component in insecticidal sprays Mosquito repellant
1,4-Dichlorobenzene	Mfg moth repellants Mfg air deodorizers Mfg dyes and intermediates Pharmaceutical mfg Soil fumigant Pesticide
Isophorone	Solvent Intermediate for alcohols Raw material for 3,5-dimethylaniline Solvent for polyvinyl and nitrocellulose resins Lacquers, finishes mfg Pesticide mfg
1,2-Dichlorobenzene	NA
Benzo (a) Pyrene	NA
Di-n-octyl phthalate	NA
Butylbenzyl phthalate	Plasticizer mfg Plastics mfg
Benzo (b) fluoranthene	NA
BENZO (ghi) PERYLENE	
Chrysene	NA

NA - Not available.

MANUFACTURE/USAGE
ORGANIC COMPOUNDS

Combe Fill South RI/FS

CHEMICAL COMPOUND	MANUFACTURE/USAGE
Fluoranthene	NA
Indeno (1,2,3-cd) pyrene	NA
Phenanthrene	NA
Pyrene	NA
Acenaphthene	Dye mfg Plastics mfg Insecticide and fungicide mfg
PESTICIDES/PCB	
Alpha - Endosulfan	NA
4,4'-DDE	Impurity of DDT Degradation of DDT Pesticide Military product
4,4'-DDT	Pesticide
Aldrin	Insecticide
Dieldrin	Insecticide Stereoisomer of endrin Wool processing industry
Delta-BHC	NA
NON-PRIORITY POLLUTANTS	
Volatiles	
O-Xylene (ortho)	Mfg phthalic acid and anhydride mfg terephthalic acid for polyester Solvent recovery plants Specialty chemical mfg

NA - Not available.

CHEMICAL COMPOUND	MANUFACTURE/USAGE
NON-PRIORITY POLLUTANTS	
Volatiles (continued)	
O-Xylene (ortho)	Mfg isophthalic acid, aviation gas, protective coatings Solvent for alkyd resins, lacquers, enamels, rubber cements Dye mfg Insecticide mfg Pharmaceuticals Asphalt and naphtha constituent
Nonane	Organic synthesis Solvent Standardized hydrocarbon Jet fuel research Mfg paraffin products Rubber industry Paper processing industry Biodegradable detergents Distillation chaser
Acetone	Mfg smokeless powder Paints, varnishes, lacquers mfg Organic chemical mfg Pharmaceutical mfg Sealants and adhesives mfg Solvents for cellulose acetate, nitrocellulose, acetylene
2-Butanone	Solvent or swelling agent for resins Intermediate in mfg of ketones and amines Flush-off paint stripper Extraction and production of wax from lube oil fractions of petroleum Solvent in nitrocellulose coatings and vinyl films Cement dust

APPENDIX S

MANUFACTURE/USAGE
INORGANIC COMPOUNDS
(Page 1 of 4)

Combe Fill South RI/FS

METALS	MANUFACTURE/USAGE
Antimony	Common constituent of alloys with other metals (lead and copper) Antimonial lead Fireproofing chemicals and compounds Ceramics and glassware Bearing metals and pigments Used against parasitic diseases and infections Fireworks
Arsenic	Pesticides Herbicides Cotton desiccants Wood preservatives A bronzing or decolorizing agent in glass manufacture In fabrication of opal glass and enamels Manufacture of dye stuffs Chemical warfare gases In purification of industrial gases (removal of sulfur) Additive in production of alloys A growth promoting agent in livestock industry A therapeutic agent
Beryllium	Missile and nuclear reactor components Rocket nozzles Aircraft brakes Electronic relays Space optics Space vehicle reentry cones Windows in x-ray tubes Inertial guidance parts Classified weapon parts Current carrying springs Welding components Bearing sleeves Non-sparking tools and dies Underseas cable repeater and amplifier housing Diamond drill bit matrixes Watch-balance wheels Aircraft and spacecraft parts

APPENDIX S

MANUFACTURE/USAGE
INORGANIC COMPOUNDS
(Page 2 of 4)

Combe Fill South RI/FS

METALS	MANUFACTURE/USAGE
Beryllium (Continued)	Resistor cores Integrated circuit chip carriers Radio and laser tubes Fluorescent tube phosphors In aluminum alloys to impart strength and hardness With silver to form untarnishable alloys
Cadmium	Rustproofing of iron (coated by electroplating) Color pigments in plastics and paints Stabilizer in plastics (stearate) Automobile radiators Electrode components in NIFE alkaline accumulators Silver solders and welding electrodes Dentistry
Chromium	Tanning industry Pigment production and application Graphics industry Corrosion-resistant alloys and heavy duty steels Chromium plating material industries
Copper	Electrical equipment Component of many alloys Plumbing and heating Salts used in pesticides Coins and utensils
Lead	Storage battery industry Alkyllead production Cable sheathing Pigments Alloys Solders
Mercury	Chlor-alkali industry Electrical equipment Paints Measurements and control systems Agriculture Dental practice Laboratories

MANUFACTURE/USAGE
INORGANIC COMPOUNDS
(Page 3 of 4)

Combe Fill South RI/FS

METALS	MANUFACTURE/USAGE
Mercury (Continued)	Detonators Mercury containing catalysts Preservatives in paper pulp industry Pharmaceuticals Cosmetic preparations Added as a germicide and fungicide in plastics, paints and pharmaceuticals Seed treatment
Nickel	Steel production Production of acid resisting alloys Electroplating Nickel-cadmium batteries Electronic components Surgical and dental instruments Manufacture of nickel salts
Selenium	Semiconductor technology and electrical engineering Glass industry Duplicating machines Inorganic pigments Additive to plastics, catalysers Rubber industries (vulcanizers) Stainless steel production Lubricants Fungicides Feed additive (inorganic salts) Dermatology Scanning of organs and tissues (radionuclides) Enamels and glazes
Silver	Coins Jewelry Tableware Component of alloys and solders Photographic processing Electrical apparatus and mirrors

APPENDIX S

MANUFACTURE/USAGE
INORGANIC COMPOUNDS
(Page 4 of 4)

Combe Fill South RI/FS

METALS	MANUFACTURE/USAGE
Silver (Continued)	Dentistry Treatment of burns Drinking water disinfectants and prophylactic agents against gonorrheal infections in newborns (silver salts) Pharmaceutical
Thallium	Used before as a rodenticide Electrical and electronics industry Photoelectric cells, lamps Semiconductors and scintillation counters As a catalyst in organic synthesis Optical systems (infared spectrometers and in crystals) Coloring glass Limited use in alloys Mineralogical analysis Pesticides Antiknock compound in gasoline
Zinc	Production of noncorrosive alloys and brass Galvanizing steel and iron products Automobile parts and household appliances Used in rubber Used as a white pigment Employed therapeutically for zinc deficiencies Pesticide

APPENDIX T

(Page 1 of 5)

CHARACTERIZATION OF ORGANIC COMPOUNDS
at
COMBE FILL SOUTH RI/FS

CHEMICAL NAME	SYNONYM	BOILING POINT (C)	MELTING POINT (C)	VAPOR PRESSURE (mmHg)	SPECIFIC GRAVITY	SOLUBILITY (mg/l)	MATRIX OCCURRENCE	NATURAL OR MAN-MADE	CARCINOGEN (C) MUTAGEN (M) TERATOGEN (T)
PRIORITY POLLUTANTS									
Volatiles									
Chloroform	Trichloromethane	62.0 61.26 61.7	-64.0 -63.5	100 @ 10.4C 160 @ 20C 150.5 @ 20C 190 @ 25C 245 @ 30C	1.489 @ 20C 1.49845 @ 15C	10000 @ 15 C 8000 @ 20 C 8200 @ 20C 9300 @ 25 C slightly in water	PWc; MWc; SWp;	MAN-MADE NATURAL?	C?,T?
Trichlorofluoromethane	Fluorotrichloromethane Fluorocarbon-11 Freon-11	24.1 23.8	-111	667 @ 20C 0.904 atm @ 20C 1.29 atm @ 30C	1.494 @ 17C 1.484 @ 17.2C	1100 @ 20C 1100 @ 25C	PWc; SWp; LWp; MWc; IFB @BM;	NA	C?
1,1,1-Trichloroethane	Methyl chloroform Chlorotene Genklene Baltana	74.1 71/81	-32.0 -32.5 -30.41	96 @ 20C 100 @ 20C 155 @ 30C	1.35 @ 20/4C 1.3376 @ 20/4C 1.3390	480-4400 @ 20C insoluble in water	PWc; IFB & BM; SWp;	NA	C
Methylene chloride	Dichloromethane Methylene dichloride Methane dichloride Methylene bichloride	39.75 39.8 40-42	-96.7 -97 -95	349 @ 20C 362.4 @ 20C 380 @ 22C 500 @ 30C	1.326 @ 20/4C	20000 @ 20 C 16700 @ 25 C 13200-20000 @ 25 C slightly in water	PWc; IFB; ITB; A; soils; MWc; LWc,p; SWc,p; SWsed,c,p; LWsed,c;	NA	M?,C,T?
1,1-Dichloroethane	Ethylidene chloride Ethylidene dichloride	57.3 57.28	-97.4 -96.98	70 @ 0C 180 @ 20C 234 @ 25C 270 @ 30C	1.175 @ 20/4C 1.174 @ 20/4C	5500 @ 20C slightly in water	SWp; LWp; MWc,p; PWc;	NA	NA
Trichloroethane	1,1,2-Trichloroethane Vinyl trichloride	114 113.77 133.77	-36.5 -35/-36.7	19 @ 20C 32 @ 30C 40 @ 35C 40 @ 35.2C	1.4416 @ 20/4C 1.4397	4500 @ 20C slightly in water	PWc;	MAN-MADE	C,M?
Benzene	Benzol Phene Cyclohexatriene	80.1	5.5	45.5 @ 10C 60 @ 15C 76 @ 20C 95.2 @ 25C 100 @ 26.1C 118 @ 30C	0.8786 @ 20/4C 0.87865	1750 @ 10C 1780 @ 20C 820 @ 22C 1780 @ 25C 1800 @ 25C slightly in water	MWc; SWp; LWc; A;	MAN-MADE NATURAL	M,C
Chloroethane	Ethylchloride Monochloroethane Hydrochloric ether Muriatic ether	12.3 12.27 12.4	-137 -138.3 -136.4	457 @ 0C 700 @ 10C 1000 @ 20C 1.9 atm @ 30C	0.92 @ 0/4C 0.8978	3330 @ 0C 5740 @ 20C slightly in water	MWc; LWc; SWp	NA	NA
Dichlorofluoromethane	Fluorocarbon-12 Freon-12 Fluorodichloromethane Dichloromonofluoromethane	8.9/29.8 9.0	-135/-127 -158	1.6 atm @ 20C 2.2 atm @ 30C 4306 @ 25C	1.421 @ 0C 1.405 @ 9C	280 @ 25C insoluble in water	MWc; LWp;	NA	NA
Toluene	Methylbenzene Phenylmethane Methylbenzol Methacide Toluol	110.4 110.6 110.8	-95.1 -95 -94.5	10 @ 6.4C 22 @ 20C 28.7 @ 25C 36.7 @ 30C 40 @ 31.8C	0.8669 @ 20/4C	470 @ 16C 515 @ 20C 534.8 @ 25C insoluble in water	MWc,p; SWp; SWsed,p; LWc,p; A; LWsed,c;	MAN-MADE NATURAL	NO
Trans-1,2-dichloroethene	trans-1,2-Dichloroethylene trans-Acetylene dichloride Dioform	48.0 47.5	-50.0	200 @ 14C	1.26	600 @ 20C slightly in water	MWc,p; SWp;	NA	NA
1,2-Dichloroethane	Ethylene dichloride Glycol dichloride Ethylene chloride Ethene dichloride	83.5 83.47	-35.4 -35.36	40 @ 10C 61 @ 20C 105 @ 30C	1.25 @ 20/4C 1.235 @ 20C	9200 @ 0C 8690 @ 20C slightly in water	MWc,p; SWp;	MAN-MADE	C?
Carbon tetrachloride	Tetrachloromethane Methane tetrachloride Perchloromethane Benzinoform	76.54 76.8 76.7	-23.0 -22 -22.9	56 @ 10C 90 @ 20C 100 @ 23C 113 @ 25C 137 @ 30C	1.594 @ 20/4C 1.59 @ 20C 1.597 @ 20C	785 @ 20C 800 @ 20C 1160 @ 25C insoluble in water	SWp; MWp;	NA	C?,M,T?

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APPENDIX T
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CHARACTERIZATION OF ORGANIC COMPOUNDS
at
COMBE FILL SOUTH RI/FS

CHEMICAL NAME	SYNONYM	BOILING POINT (C)	MELTING POINT (C)	VAPOR PRESSURE (mmHg)	SPECIFIC GRAVITY	SOLUBILITY (mg/l)	MATRIX OCCURRENCE	NATURAL OR MAN-MADE	CARCINOGEN (C) MUTAGEN (M) TERATOGEN (T)
Chlorobenzene	Phenylchloride Benzene chloride Monochlorobenzene	132 131.7	-45.0	8.8 @ 20C 11.72 @ 20C 10 @ 22.2C 11.8 @ 25C 15 @ 30C	1.106 @ 20/4C 1.1066 @ 20/4C 1.113 @ 15.5/15.5C	500 @ 20C 488 @ 25C 448 @ 30C 488 @ 30C insoluble in water	SWp; LWc,p; MWc;	NA	NO
1,2-Dichloropropane	Propylene chloride Propylene dichloride	96.8	-100 -100/-80	40 @ 19.4C 42 @ 20C 50 @ 25C 66 @ 30C	1.156 @ 20/20C 1.1593 @ 20/20C	2700 @ 20C slightly in water	SWp;	NA	M?
Ethyl benzene	Phenylethane Ethylbenzol Benzylethane	136.2	-94.97 -94.9	7 @ 20C 10 @ 25.9C 12 @ 30C	0.8670 @ 20/4C 0.8669 @ 20/4	140 @ 15C 206 @ 15C 152 @ 20C insoluble in water	SWp; LWc; A; MWc,p; LWsed,c;	MAN-MADE	NO
Tetrachloroethene	Tetrachloroethylene Perchloroethylene Perchloroethene Ethylene tetrachloride	121.2 121 121.4	-22.7/-19 -23.35	14 @ 20C 15.8 @ 22C 24 @ 30C 45 @ 40C	1.626 @ 20C 1.6311 @ 15/14C	150-200 @ 20C 150 @ 25C insoluble in water	SWp; MWc,p; soils; A; LWsed,c;	MAN-MADE	C?,M?
Trichloroethylene	Trichloroethene Ethylene trichloride	86.7	-87 -86.8 -73	20 @ 0C 57.9 @ 20C 95 @ 30C 100 @ 32C	1.4642 @ 20C 1.4649 @ 20/4c	1100 @ 20C 1.1 @ 25C slightly in water	SWp; A; MWc,p;	MAN-MADE	M?,C?,T?
Bromodichloromethane	Dichlorobromomethane	90.0 89.2-90.6	-57.1	50 @ 20C 50 @ 25C	1.980 @ 20/4C 1.971 @ 25/25C	5000 @ 25C (assumed) insoluble in water	SWp;	MAN-MADE	NA
Acid/Phenolic									
Pentachlorophenol	Chlorophen Penchlorol PCP	310 (d)	190 188/191	0.00011 @ 20C 40 @ 211.2	1.978 @ 22/4C	5 @ 0C 14 @ 20C 80 @ 20C 35 @ 50C 85 @ 70C slightly in water	IFB; PWc; soils;	MAN-MADE	C?,T
Phenol	Carbolic acid Benzenol Hydroxybenzene Phenic acid Phenyl hydrate Phenyl hydroxide	182 181.9 181.75	40/43 41 40.6 40.90	0.5293 @ 20C 0.2 @ 20C 0.53 @ 20C 1.0 @ 40C 1.0 @ 40.1C	1.072	82000 @ 15C 93000 @ 25C sol. in cold water mis. in hot water	MWc; SWc; LWc;	NA	M,C?
Base/Neutral									
Di-n-butyl phthalate	Dibutyl phthalate Dibutyl-1,1-benzene dicarbox- ylate DBP n-Butyl phthalate	340	-35.0	0.1 @ 115C 2.0 @ 150C	1.047 @ 20/20C 1.049 @ 20/20C 1.0465	13 @ 25C 400 @ 25C 4500 @ 25C 28 @ 2oC insoluble in water	SWsed,p; SWp; soils; ITB @BM; LWsed,c; PWc;	MAN-MADE NATURAL	C
Bis(2-ethylhexyl) phthalate	Di(2-ethylhexyl)phthalate DEHP Di(2-ethylhexyl)benzenedicarboxy- late Di-sec-octyl phthalate	386 386.9 385	-50 -55	2.6E-10 @ 20C <<0.01 @ 20C 1.2 @ 200C	0.99 @ 20/20C	0.4 @ 25C 1.3 @ ?C	soils; SWp; LWsed,c; IFB & ITB @ BM; SWsed,c,p; PWc; A;	MAN-MADE NATURAL?	T?,C
Diethyl phthalate	Ethyl phthalate DEP	298 302	-40.5	0.05 @ 70C 14 @ 163C 30 @ 182C 734 @ 295C	1.120 @ 25/25C 1.110 1.1175	insoluble in water	IFB @BM; PWc; SWp; MWc; LWp;	MAN-MADE NATURAL?	T?
1,4-Dichlorobenzene	p-Dichlorobenzene Paradichlorobenzene	174 173.4	53.1 53	0.6 @ 20C 1.18 @ 25C 1.8 @ 30C 10 @ 54.8C	1.4581 @ 20/4C	79 @ 25C insoluble in water	MWc; SWp;	MAN-MADE	?

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APPENDIX T
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CHARACTERIZATION OF ORGANIC COMPOUNDS
at
COMBE FILL SOUTH RI/FS

CHEMICAL NAME	SYNONYM	BOILING POINT (C)	MELTING POINT (C)	VAPOR PRESSURE (mmHg)	SPECIFIC GRAVITY	SOLUBILITY (mg/l)	MATRIX OCCURRENCE	NATURAL OR MAN-MADE	CARCINOGEN (C) MUTAGEN (M) TERATOGEN (T)
Isophorone	Isoacetophorone Isooctaphenone Isoforone Isophoron Trimetylcyclohexenone 3,5,5-Trimetyl-2-cyclohexene-1-one	215	-8	0.38 @ 20C	0.9229	12000 @ ?C insoluble in water	MWc;	MAN-MADE	NO
1,2-Dichlorobenzene	Orthodichlorobenzene o-Dichlorobenzene Dowtherm E	180/183 180.5 179	-17 -17.6 -16.7/-18	1 @ 20C 1.5 @ 25C 1.9 @ 30C	1.305 @ 20/4C 1.307 @ 20/20C	100 @ 20C 145 @ 25C insoluble in water	SWp; MWc;	NA	?
Benzo(a)pyrene	3,4-Benzopyrene BaP	311 @ 10mm Hg 312	179	5 E-9 @ 25C	NA	0.0038 @ 25C insoluble in water	soils; SWsed,c;	MAN-MADE NATURAL	M?,C?,T?
Di-n-octyl phthalate	Dioctyl-o-benzenedicarboxylate Octyl phthalate n-Dioctyl phthalate DOP	220 @ 4mm	-25	<0.2 @ 150C	NA	3 @ 25C	Lsed,c; SWsed,p; soils;	MAN-MADE NATURAL?	T,C
Butylbenzyl phthalate	Benzylbutyl phthalate BBP	377	-35	NA	NA	2.9 @ ?C	Lsed,c; SWsed,p;	MAN-MADE NATURAL?	NA
Benzo(b)fluoranthene	Benz(e)acephenanthrylene 2,3-Benzofluoranthene 3,4-Benzofluoranthene B(b)F	NA	168 167/168	1E-11 - 1E-6 @ 20C	NA	NA	SWsed,c;	MAN-MADE NATURAL	C?,M
Benzo(ghi)perylene	1,12-Benzoperylene	NA	222	1E-10 @ 20C	NA	0.00026 @ 25C	SWsed,c;	MAN-MADE NATURAL	M
Chrysene	1,2-Benzophenanthrene Benz(a)phenanthrene 1,2,5,6-Dibenzonaphthalene	488	256 254	1E-11 - 1E-6 @ 20C	1.274 @ 20/4c	0.002 @ 25C	SWsed,c;	MAN-MADE NATURAL	NA
Fluoranthene	Benzo(jk)fluorene Idryl	250 367	111 120 107	1E-6 to 1E-4 @ 20C 0.01 @ 20c	NA	0.26 @ 25C	SWsed,c,p; LWsed,c;	MAN-MADE NATURAL?	M
Indeno(1,2,3-cd)pyrene	2,3-o-Phenylenepyrene 2,3-Phenylenepyrene	NA	162.5/164	1E-10 @ 20C	NA	NA	SWsed,c;	MAN-MADE NATURAL	C?,M
Phenanthrene	Phenanthren	340 339	101 100	6.8E-4 @ 20C 1 @ 118.3C	1.025 1.179 @ 25C	1.6 @ 15C 1.00 @ 25C 1.29 @ 25C insoluble in water	SWsed,c,p; LWsed,c;	MAN-MADE NATURAL?	M
Pyrene	Benzo(def)phenanthrene	404	150 156	6.85E-7 @ 20C	1.271 @ 23C	0.14 @ 25C 0.132 @ 25C insoluble in water	SWsed,c,p; LWsed,c;	MAN-MADE NATURAL	M,C
Acenaphthene	NA	NA	96	1E-3 to 1E-2 @ 20C	NA	3.42 @ 25C	SWsed,p;	MAN-MADE NATURAL	NA
Naphthalene 2-Methyl naphthalene	NA NA						LWc; MWc; LWsed,c		
Pesticide/PCB									
alpha-Endosulfan	Thiodan Cyclodan Beosit Malix Thimul Thifor 5-Norbornene-2,3-dimethanol-1,4,5, 6,7,7-hexachlorocyclic sulfite 6,7,8,9,10,10-hexachloro-1,5,5a,6, 9,9a-hexahydro-6,9,-methano-2,4,3- benzo(e)dioxathiepin-3-oxide	NA	108/110 70/100	0.009 @ 80C 0.00001 @ 25C	NA	0.164 @ ?C 0.26 @ 20C (pH 5.6) 0.15 @ 22C (ph 7.2) 0.53 @ 25C 0.6 @ ?C	SWp;	NA	NO
4,4'-DDE	1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene 2,2-Bis(4-chlorophenyl)-1,1-dichloro- ethene DDE	NA	88/90	6.8E-6 @ 20C	NA	14 ppb @ 25C 120 ppb @ 25C 40 ppb @ 20C 1.2 @ 25C 1.3 @ 25C	soils;	NA (degradation product of DDT)	NA

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APPENDIX T
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CHARACTERIZATION OF ORGANIC COMPOUNDS
at
COMBE FILL SOUTH RI/FS

CHEMICAL NAME	SYNONYM	BOILING POINT (C)	MELTING POINT (C)	VAPOR PRESSURE (mmHg)	SPECIFIC GRAVITY	SOLUBILITY (mg/l)	MATRIX OCCURRENCE	NATURAL OR MAN-MADE	CARCINOGEN (C) MUTAGEN (M) TERATOGEN (T)
4,4'-DDT	1,1,1-Trichloro-2,2-bis(4-chlorophe-nyl)-ethane pp'-DDT Dichlorodiphenyltrichloroethane Chlorophenotane Dicophane Chlorophenothane Gesarol Geusarol Neocid	105	108/109	1.5E-7 @ 20C 1.9E-7 @ 25C 7.3E-7 @ 30C	NA	5.5 ppb @ 25C 25 ppb @ 25C <1.2 ppb @ 25C	soils;	NA	M?,C?
Aldrin	Octalene	NA	104/105	2.31E-5 @ 20C 6E-6 @ 25C	NA	27 ppb @ 25-29C 17 ppb @ 25C 180 ppb @ 25C insoluble in water	soils;	NA	C?,T?
Dieldrin	Octalox HEOD	NA	175/176 150	1.78E-7 @ 20C 2.9E-6 @ 20C	1.75	186 ppb @ 25-29C 195 ppb @ 25C 200 ppb @ 25C 200 ppb @ 26.5C insoluble in water	soils;	NA	M,C?,T?
Delta-BHC	delta-Hexachlorocyclohexane delta-Benzene hexachloride delta-HCH	NA	138/139	1.7E-5 @ 20C 2E-2 @ 20C	NA	8.64-15.7 @ 28C 31.4 @ 25C 21.3 @ 25C	SWsed,p;	NA	C?
NON-PRIORITY POLLUTANTS (QUANTIFIED)									
Volatiles									
Xylene									
a. o-Xylene	ortho-Xylene o-Xylol 1,2-Xylene o-Methyl toluene o-Dimethyl benzene 1,2-Dimethyl benzene	144.4	-25 -25.2	5 @ 20C 9 @ 30C	0.8802 @ 20/4C	175 @ 20C insoluble in water	SWp; A; LWsed,c	MAN-MADE NATURAL	NO
b. p-Xylene	para-Xylene p-Xylol p-Methyl toluene p-Dimethyl benzene 1,4-Dimethyl benzene 1,4-Xylene	138.4 138.3	13.3 13/14	6.5 @ 20C 10 @ 27.3C 12 @ 30C	0.8611 @ 20/4C	198 @ 25C insoluble in water	SWp; A; LWsed,c	NA	NA
c. m-Xylene	meta-Xylene m-Xylol 1,3-Xylene m-Methyl toluene m-Dimethyl benzene 1,3-Dimethyl benzene	139	-47.9 -48/-53	6 @ 20C 11 @ 30C 10 @ 28.3C	0.8642 @ 20/4C	insoluble in water	SWp; A; LWsed,c	NA	NO
Nonane	NA	151 150.7 150.8	-53.7 -54 -51	3.22 @ 20C 10 @ 38C	0.7176 @ 20/4C	0.07 @ 20C (dist.) 0.43 @ 20C (salt) insoluble in water	SWp;	MAN-MADE	NA
Acetone	2-Propanone Dimethyl ketone DMK	56.2 56.48	-95 -94.6 -95.35	89 @ 5C 270 @ 30C 400 @ 39.5C	0.791 @ 20C 0.7972 @ 15C 0.7899	miscible in water	soils; A; LWsed,c; SWsed,c	NA	NA
2-Butanone	Ethylmethylketone Methylethylketone MEK	79.6 79.57	-86.35 -86.4 -85.9	77.5 @ 20C 71.2 @ 20C	0.805 @ 20/4C 0.80615 @ 20/20C 0.8054	353 g/l @ 10C 190 g/l @ 90C very sol. in water	soils; A;	NA	NA
4-Metyl-2-pentanone	Isobutyl methyl ketone Metylisobutylketone Isopropyl acetone Hexanone Hexone MBIK	116.85 116/119 118	-84.7 -85/80 -80.2	6 @ 20C 16 @ 20C 10 @ 30C	0.7978 @ 20C 0.8017 @ 20/4C 0.803	17000 @ 20C 19000 slightly in water	soils; A;	NA	NA

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APPENDIX T
(Page 5 of 5)
CHARACTERIZATION OF ORGANIC COMPOUNDS
at
COMBE FILL SOUTH RI/FS

CHEMICAL NAME	SYNONYM	BOILING POINT (C)	MELTING POINT (C)	VAPOR PRESSURE (mmHg)	SPECIFIC GRAVITY	SOLUBILITY (mg/l)	MATRIX OCCURRENCE	NATURAL OR MAN-MADE	CARCINOGEN (C) MUTAGEN (M) TERATOGEN (T)
TENTATIVELY IDENTIFIED HALOGENATED COMPOUNDS									
3,3,3-Trichloro-1-propene	3,3,3-Trichloropropene 3,3,3-trichloropropylene	114/115	-30	NA	1.369 @ 20/20C	insoluble in water (less than 10%)	SWc; PWc;	NA	NA
1-Chloro-2-propanol	Propylene chlorohydrin 1-Chloropropan-2-ol	126/127 127/133	NA	NA	1.115 @ 20/20C 1.103 @ 20C	miscible in water	SWc; A;	NA	NA
1,1-Biphenyl-4-fluorophthalate	NA	NA	NA	NA	NA	NA	PWc;	NA	NA
Tetrachloroethane	Acetylene tetrachloride 1,1,2,2-Tetrachloroethane	146 146.2 146.4	-44 -36 -43.8 -42.5	6.6mbar @ 20C 5mm @ 20C 8.5 @ 30C	1.5953 @ 20/4C	0.3g/100ml @ 25C 2900mg/l @ 20C slightly in water (less than 10%)	PWc;	MAN-MADE	NA
1,3-Dichlorobenzene	meta-Dichlorobenzene m-Dichlorobenzene	172 173	-24.8 -24.7	NA	1.2884 @ 20/4C	123 @ 25c insoluble in water (less than 10%)	MWc;	NA	NA
Cis-2-bromocyclohexanol	NA	NA	NA	NA	NA	NA	MWc;	NA	NA
Fluorobiphenol	NA	NA	NA	NA	NA	NA	MWc;	NA	NA
4-Chloro-2-methyl-benzenamine	NA	NA	NA	NA	NA	NA	MWc;	NA	NH
Dichlorofluoroethane	NA	NA	NA	NA	NA	NA	MWc;	NA	NA
2-Bromo-1,3-cyclopentanedione	NA	NA	NA	NA	NA	NA	PWc;	NA	NA
2-Fluorophenol	NA	NA	NA	NA	NA	NA	LWsed,c;	NA	NA
1,4-Dichlorobutane	Tetramethylene dichloride	153.9 161/163	-37.3	NA	1.1408 @ 20/4C	insoluble in water (less than 10%)	SWp;	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	Arklone R-113	48	-35	270 @ 20C 400 @ 30C	1.56 @ 25C	NA	soils; MWp;	NA	NA
3-Fluoro-2-propynenitrile	NA	NA	NA	NA	NA	NA	soils; MWp;	NA	NA
1,3-Dichlorocyclobutane	NA	NA	NA	NA	NA	NA	soils; MWp;	NA	NA
1-Fluoro-4-methoxy-benzene	NA	NA	NA	NA	NA	NA	soils; MWp;	NA	NA
2-Chloro-1,1-difluoroethylene	NA	NA	NA	NA	NA	NA	soils;	NA	NA

NOTES:
c-current RI/FS program sampling
p-previous sampling
d-decomposes
BM-below minimum detection limit
?-unspecified, unknown, indefinite
NA-not available
IFB-found in field blanks
ITB-found in trip blanks
QAC-QA/QC blanks
TP-test pits
A-air, listed if contaminant greater than BM
LW-leachate water (p and/or c), listed if contaminants greater than BM
LWsed-leachate water sediment (p and/or c), listed if contaminants greater than BM
MW-monitoring well water (p and/or c), listed if contaminants greater than BM
NO-neither mutagenic nor carcinogenic nor teratogenic
PW-potable water (p and/or c), listed if contaminants greater than BM
SWsed-surface water sediment (p and/or c), listed if contaminants greater than BM
soils-soil boring/rock coring, field hand augering, and/or test pits, listed if contaminants greater than BM
SW-surface water (p and/or c), listed if contaminants greater than BM

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APPENDIX U

CHARACTERIZATION OF INORGANIC COMPOUNDS
at
COMBE FILL SOUTH RI/FS

CHEMICAL	SPECIFIC GRAVITY	CARCINOGEN TERATOGEN MUTAGEN	MATRIX OCCURRENCE at COMBE SOUTH	SOLUBILITY (mg/l)
METALS				
Antimony	6.684 @ 25C	NA	SWp; SWsed,c; LWp; A;	5000 @ R.T. (SbCl3)
Arsenic	5.727 @ 14C 5.72 @ 20C	C,M,T	SWp; SWsed,c,p; soils; MWc,p; LWsed,c; LWp;	Forms many complexes with a number of organics - very sol.
Beryllium	1.85 @ 20C	M,C?	SWp,c; SWsed,c,p; soils; MWc; A; LWp;	low sol. for hydroxide
Cadmium	8.642 @ 7C	M,T,C?	SWp; SWsed,c,p; soils; MWc,p; LWsed,c; A; LWp;	insoluble in water (low - depends on speciation)
Chromium	7.20 @ 28C	M,C	SWsed,c,p; soils; LWp; MWc,p; LWsed,c; A; SWp;	insoluble in water (very low solubility)
Copper	8.92	M (Cu salts)	SWc,p; SWsed,c,p; LWc,p; soils; MWc,p; LWsed,c; A;	insoluble in water (low sol. - highly
Lead	11.3437 @ 16C	M,T,C?	SWc,p; SWsed,c,p; LWc,p; soils; MWc,p; LWsed,c; A;	insoluble in water
Mercury	13.5939	M	SWp; SWsed,p; LWp; MWc,p;	insoluble in water
Nickel	8.90	M,C,T	SWsed,c,p; soils; MWc; LWp; LWsed,c; A; SWp;	insoluble in water
Selenium	4.81 @ 20/4C	M,T	SWc,p; SWsed,p; MWc,p; LWp;	insoluble in water
Silver	10.5 @ 20	NA	SWp; soils; MWc,p;	insoluble in water
Thallium	11.85	M (Tl salts)	SWp; SWsed,p; MWc; soils; LWp;	insoluble in water
Zinc	7.14	M?,C?,T?	SWc,p; SWsed,c,p; soils; MWc,p; LWsed,c; LWc,p; A;	insoluble in water
RADIOACTIVITY				
Gross-alpha	NA	NA	SWp; LWc,p;	NA
Gross-beta	NA	NA	SWp; LWc,p;	NA

NOTES:
c-current RI/FS program sampling
p-previous sampling
d-decomposes
BM-below minimum detection limit
?-unspecified, unknown, indefinite
NA-not available
IFB-found in field blanks
ITB-found in trip blanks
QAC-QA/QC blanks
A-air, listed if contaminant greater than BM
LW-leachate water (p and/or c), listed if contaminants greater than BM
LWsed-leachate water sediment (p and/or c), listed if contaminants greater than BM
MW-monitoring well water (p and/or c), listed if contaminants greater than BM
PW-potable water (p and/or c), listed if contaminants greater than BM
SWsed-surface water sediment (p and/or c), listed if contaminants greater than BM
soils-soil boring/rock coring, field hand augering, and/or test pits, listed if contaminants greater than BM
SW-surface water (p and/or c), listed if contaminant greater than BM

APPENDIX W

CHEMICALS IN POTABLE WATER AT COMBE FILL SOUTH LANDFILL

CHEMICAL	CARCINOGEN (C) MUTAGEN (M) TERATOGEN (T)	NATIONAL DRINKING WATER CRITERIA MCL	RMCL	CLEAN WATER ACT (a) WATER QUALITY CRITERIA FOR HUMAN HEALTH-- FISH AND DRINKING WATER	CLEAN WATER ACT (a) WATER QUALITY CRITERIA FOR HUMAN HEALTH-- DRINKING WATER ONLY	CLEAN WATER ACT (b) CANCER RISK CONCENTRATION	SDA HEALTH ADVISORIES 1 DAY	10 DAY	CHRONIC	ACCEPTABLE DAILY INTAKE VALUES "ADI" (mg/day)	PRELIMINARY PROTECTIVE CONCENTRATION LIMITS (PPCL)	NEW JERSEY GROUNDWATER QUALITY CRITERIA CH
PRIORITY POLLUTANTS												
Volatiles (ppb)												
Benzene	C?,M	5	0	0 (0.66)	0 (0.67)	0.66	-	230	70	-	0.673	-
Carbon tetrachloride	-	-	-	0 (0.4)	0 (0.42)	-	-	-	-	-	-	-
Chloroform	C?	-	-	0 (0.19)	0 (0.19)	0.19	-	-	-	-	0.194	-
1,1-Dichloroethane	C	-	-	i	i	-	-	-	-	0.1	4500	-
1,2-Dichloroethane	C	5	0	0 (0.94)	0 (0.94)	0.94	-	-	-	-	0.507	-
Methylene Chloride	C	-	-	0 (0.19)	0 (0.19)	-	-	-	-	-	-	-
Tetrachloroethylene	C	-	-	0 (0.8)	0 (0.88)	-	2300	175	20	-	-	-
Toluene	NO	-	2000	14300	15000	-	21500	2200	340	30	15000	-
Trichlorethylene	C	5	0	0 (2.7)	0 (2.8)	2.7	2000	200	75	-	-	-
1,1,1-Trichloroethane	C?	200	200	18400	19000	-	-	-	1000	-	-	-
Acid/phenolics (ppb)												
Pentachlorophenol	-	-	200	1010	1010	-	-	-	-	-	-	-
Phenol	-	-	-	3500	3500	-	-	-	-	7	3500	-
Metals (ppm)												
Antimony	NO	-	-	0.146	0.146	-	-	-	-	0.29	145	-
Arsenic	C	0.05	0.05	0 (0.0000022)	0 (0.0000025)	2.2	-	-	-	-	0.0025	0.05
Cadmium	-	0.01	0.005	0.01	0.01	-	-	-	-	-	0.00449	0.01
Chromium	C	0.05 (total)	0.12 (total)	0.05 (+6)	0.05 (+6)	-	-	-	-	0.15	0.000354	0.05
				170 (+3)	179 (+3)							-
Copper	-	-	1.3	1 (organoleptic)	1 (organoleptic)	-	-	-	-	-	-	1.0
Lead	-	0.05	0.02	0.05	0.05	-	-	-	-	-	-	0.05
Mercury	-	0.002	0.003	0.000144	0.01	-	-	-	-	0.02	2	0.002
Selenium	-	0.01	0.045	0.01	0.01	-	-	-	-	0.7	-	0.01
Silver	-	0.05	-	0.05	0.05	-	-	-	-	0.12	-	0.05
Zinc	-	5.0	-	5 (organoleptic)	5 (organoleptic)	-	-	-	-	-	-	5
Miscellaneous (ppb)												20.0
Cyanides	NO	-	-	200000	200000	-	-	-	-	-	-	300
Phenols	NO	-	-	-	-	-	-	-	-	-	-	-
Radioactivity (pCi/l)												
Gross alpha	-	15	-	15	15	-	-	-	-	-	-	-
Gross beta	-	-	-	-	-	-	-	-	-	-	-	-
NON-PRIORITY POLLUTANTS (QUANTIFIED)												
Volatiles (ppb)												
Dichlorodifluoromethane	NO	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	NO	-	-	-	-	-	-	-	-	-	-	-

- No published information
i Insufficient data available to determine
? Possible, data still under review
NO Not carcinogenic nor mutagenic nor teratogenic
RMCL Recommended Maximum Contaminant Levels
MCL Maximum Contaminant Levels
PPCL Preliminary Protective Concentration Limits at increased cancer risk of 1.0E-06
ppm =mg/l
ppb =ug/l
(a) Concentration in parentheses corresponds to a carcinogenic risk of 1.0E-06
(b) Concentrations are for 1.0E-06 increased cancer risk levels

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APPENDIX X

CHEMICALS IN LEACHATE AT COMBE FILL SOUTH LANDFILL

CHEMICAL	CARCINOGEN (C) MUTAGEN (M) TERATOGEN (T)	NATIONAL DRINKING WATER CRITERIA RIA MCL	RMCL	CLEAN WATER ACT (a) WATER QUALITY CRITERIA FOR HUMAN HEALTH-- FISH AND DRINKING WATER	CLEAN WATER ACT (a) WATER QUALITY CRITERIA FOR HUMAN HEALTH-- DRINKING WATER ONLY	CLEAN WATER ACT (b) CANCER RISK CONC. (ppb)	CLEAN WATER ACT CHEMICAL EXPOSURE FOR AQUATIC LIFE (ppb)	ACCEPTABLE DAILY INTAKE VALUES "ADI" (mg/day)	PRELIMINARY PROTECTIVE CONCENTRATION LIMITS (PPCL)	NEW JERSEY AMBIENT WATER QUALITY CRITERIA FW-2
PRIORITY POLLUTANTS										
Volatiles (ppb)										
Benzene	C?,M	5	0	0 (0.66)	0 (0.67)	0.66	i	-	0.673	-
Chlorobenzene	NO	-	-	488	408	-	50	1	500	-
Chloroethane	-	-	-	i	i	-	-	-	19000	-
1,1-Dichloroethane	NO	-	-	i	i	-	-	0.1	4500	-
Ethylbenzene	NO	-	680	1400	2400	-	i	9.5	4750	-
Methylene Chloride	C?	-	-	0 (0.19)	0 (0.19)	-	-	-	-	-
Tetrachloroethylene	C	-	-	0 (0.8)	0 (0.88)	-	840	-	-	-
Toluene	NO	-	2000	14300	15000	-	i	30	15000	-
Trans-1,2-dichloroethylene	NO	-	70	i	i	-	-	-	-	-
Trichloroethylene	C	5	0	0 (2.7)	0 (28)	2.7	21900	-	-	-
Vinyl Chloride	C,M	1	0	0 (2.0)	0 (2.0)	2	i	2	-	-
Acid/Phenolics (ppb)										
Phenol	-	-	-	3500	3500	-	2560	7	3500	-
2,4-Dimethyl phenol	-	-	-	-	-	-	-	-	385	-
Base/Neutrals (ppb)										
1,2-Dichlorobenzene	-	-	-	400	470	-	763	6.3	3150	-
1,4-Dichlorobenzene	-	750	750	400	470	-	763	-	-	-
Diethyl Phthalate	NO	-	-	350000	434000	-	3	-	-	-
Bis(2-ethylhexyl) phthalate	C	-	-	15000	21000	-	-	-	-	-
Butylbenzyl phthalate	-	-	-	-	-	-	-	-	-	-
Napthalene	-	-	-	i	i	-	620	-	-	-
Metals (ppm)										
Arsenic	C	0.050	0.050	0 (0.0000022)	0 (0.0000025)	0.0000022	40	-	0.0025	0.05
Beryllium	C?	-	-	0 (0.0000037)	0 (0.0000039)	-	5.3	-	0.00396	-
Cadmium	-	0.010	0.005	0.01	0.01	-	e^[1.05(ln H)-8.53]	-	0.00449	0.01
Chromium	C	0.050 (total)	120 (total)	0.05 (+6) 170 (+3)	0.05 (+6) 179 (+3)	-	0.29 (+6) 44 (+3)	0.15	0.000854	0.05 (total)
Copper	-	-	1.300	1 (organoleptic)	1 (organoleptic)	-	5.6	-	-	-
Lead	-	0.050	0.020	0.05	0.05	-	e^[2.35(ln H)-9.48]	-	-	0.05
Mercury	-	0.002	0.003	0.000144	0.01	-	0.00057	0.02	2	-
Nickel	-	-	-	-	-	-	-	1.5	0.0304	-
Selenium	-	0.010	0.045	0.01	0.01	-	35	0.7	-	0.01
Thallium	-	-	-	0.013	0.0178	-	40	0.037	-	-
Zinc	-	5.000	-	5 (organoleptic)	5 (organoleptic)	-	47	-	-	-
Miscellaneous (ppb)										
Phenols	NO	-	-	-	-	-	2560	-	-	-
Cyanides	NO	-	-	200000	200000	-	-	-	-	-
Radioactivity (pCi/l)										
Gross alpha	-	15	-	-	-	-	-	-	-	-
Gross beta	-	-	-			-	-	-	-	-
NON-PRIORITY POLLUTANTS (QUANTIFIED)										
Volatiles (ppb)										
Trichlorofluoromethane	NO	-	-	-	-	-	-	-	-	-

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- No published information
i insufficient data available to determine
? Possible carcinogen, data still under review
NO Not carcinogen nor mutagen nor teratogen
RMCL Recommended Maximum Contaminant Levels
MCL Maximum Contaminant Levels
PPCL Preliminary Protective Concentration Limits at increased cancer risk of 1.0E-06
ppm =mg/l
ppb =ug/l
(a) Concentration in parentheses corresponds to a carcinogenic risk of 1.0E-06
(b) Concentrations are for 1.0E-06 increased cancer risk levels

APPENDIX Y

CHEMICALS IN SURFACE WATER AT COMBE FILL SOUTH LANDFILL

CHEMICAL	mutagen carcinogen teratogen	(NATIONAL DRINKING WATER CRITERIA) MCL	RMCL	CLEAN WATER ACT (a) WATER QUALITY CRITERIA FOR HUMAN HEALTH-- FISH AND DRINKING WATER	CLEAN WATER ACT (a) WATER QUALITY CRITERIA FOR HUMAN HEALTH-- DRINKING WATER ONLY	CLEAN WATER ACT CHEMICAL EXPOSURE FOR AQUATIC LIFE	NEW JERSEY AMBIENT WATER QUALITY CRITERIA FW-2	(b) CLEAN WATER ACT CANCER RISK CONCENTRATION	ACCEPTABLE DAILY INTAKE VALUES "ADI" (mg/kg/day)	PRELIMINARY PROTECTIVE CONCENTRATION LIMITS (PPCL)
PRIORITY POLLUTANTS										
Volatiles (ppb)										
Benzene	C?,M	5	0	0 (0.66)	0 (0.67)	i	-	0.66	-	0.673
Carbon Tetrachloride	C?,M	5	5	0 (0.40)	0 (0.42)	i	-	0.40	-	-
Chloroform	C?	-	-	0 (0.19)	0 (0.19)	1240	-	0.19	-	0.194
1,1-Dichloroethane	NO	-	-	i	i	-	-		0.1	4500
1,2-Dichloroethane	C?	5	0	0 (0.94)	0 (0.94)	20000	-	0.94	-	0.507
1,2-Dichloropropane	-	-	-	i	i	-	-	-	-	-
Ethylbenzene	NO	-	680	1400	2400	i	-	-	9.5	4750
Methylene Chloride	C?	-	-	0 (0.19)	0 (0.19)	-	-	-	-	-
Tetrachloroethylene	C	-	-	0 (0.8)	0 (0.88)	840	-	-	-	-
Toluene	NO	-	2000	14300	15000	i	-	-	30	15000
Trans-1,2-dichloroethylene	NO	-	70	i	i	-	-	-	-	-
Trichloroethylene	C	5	0	0 (2.7)	0 (2.8)	21900	-	2.7	-	-
Acid/Phenolics (ppb)										
Phenol	-	-	-	3500	3500	-	-	-	-	-
Base/Neutrals (ppb)										
1,2-Dichlorobenzene	NO	-	-	400	470	50	-	-	6.3	3150
1,4-Dichlorobenzene	NO	750	750	400	470	50	-	-	-	-
Diethyl Phthalate	NO	-	-	350,000	434,000	3	-	-	-	-
Bis(2-ethylhexyl) phthalate	-	-	-	15000	21000	-	-	-	-	-
Pesticides/PCBs (ppb)										
a-endosulfan	-	-	-	74	139	0.056	0.056	-	-	-
Metals (ppm)										
Arsenic	C	0.05	0.05	0 (0.0000022)	0 (0.0000025)	40	0.05	0.0000022	-	0.0025
Beryllium	C?	-	-	0.0000037	0.0000039	-	-	-	-	0.00396
Cadmium	-	0.01	0.005	0.01	0.01	e^[1.05(ln H)-8.53]	0.01	-	-	0.00449
Chromium	C	0.05(total)	0.12(total)	0.05 (+6) 170 (+3)	0.05 (+6) 179 (+3)	0.29 44	0.05 (total)	-	0.15	0.000854
Copper	-	-	1.300	1 (organoleptic)	1 (organoleptic)	5.6	-	-	-	-
Lead	-	0.05	0.02	0.05	0.05	e^[2.35(ln H)-9.40]	0.05	-	-	-
Mercury	-	0.002	0.003	0.000144	0.01	0.00057	-	-	0.02	2
Selenium	-	0.01	0.045	0.01	0.01	35	0.01	-	0.7	-
Silver	-	0.05	-	0.05	0.05	0.12	0.05	-	0.12	-
Zinc	-	-	-	5 (organoleptic)	5 (organoleptic)					
Miscellaneous (ppb)										
Cyanides	-	-	-	200000	200000					
Phenols	-	-	-	-	-	-	-	-	-	-
Radioactivity (pCi/l)										
Gross alpha	-	-	-	-	-	-	-	-	-	-
Gross beta	-	-	-	-	-	-	-	-	-	-

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- \- No published information
- i Insufficient data to determine
- ? Possible, data still under review
- NO Not carcinogen nor mutagen nor teratogen
- RMCL Recommended Maximum Contaminant Levels
- MCL Maximum Contaminant Levels
- PPCL Preliminary Protective Concentration Limits at increased cancer risk of 1.0E-06
- ppm =mg/l
- ppb =ug/l
- (a) Concentrations in parentheses correspond to a carcinogenic risk of 1.0E-06
- (b) Concentrations are for 1.0E-06 increased cancer risk levels

APPENDIX Z

CHEMICALS IN AIR AT COMBE FILL SOUTH LANDFILL

CHEMICAL	CARCINOGENIC (C) MUTAGENIC (M) TERATOGENIC (T)	UNIT CANCER RISK 1.0xE-06	NJ AMBIENT AIR OR MAINTENANCE AREA CRITERIA (ug/m3)
PRIORITY POLLUTANTS			
Volatiles			160 (b)
Benzene	C?,M	6.9	-
Ethylbenzene	NO	-	-
Methylene Chloride	C?	0.18	-
Tetrachloroethylene	C	1.7	-
Toluene	NO	-	-
Trichloroethylene	C	4.1	-
Base/Neutrals			
bis(2-Ethylhexyl)phthalate	C?	0.13	-
Diethyl phthalate	-	-	-
Di-n-butylphthalate	C	0.13	-
Metals			
Antimony	-	-	-
Beryllium	C?,M	-	-
Cadmium	C?,M,T	-	-
Chromium	C,M	-	-
Copper	M (salts)	-	-
Lead	C?,M,I	-	1.5 (a)
Nickel	-	-	-
Zinc	C?,M?,T?	-	-
NON-PRIORITY POLLUTANTS (QUANTIFIED)			
Volatiles			
Acetone	-	-	-
2-Butanone	-	-	-
Xylenes	-	-	-
4-Methyl-2-Pentanone	-	-	
TENTATIVELY IDENTIFIED HALOGENATED COMPOUNDS			
1-Chloro-2-propanone			

- No published information
I Insufficient data available to determine
? Possible, data still under review
NO Not carcinogen nor mutagen nor teratogen
(a) Quarterly mean averaging period
(b) Non-methane hydrocarbons, primary and secondary standards; 6-9 A.M. averaging period not to be exceeded more than once per twelve months

NOTES: Upwind and downwind stations defined during specific sampling days.
Increase risk of cancer from breathing as defined by [illegible].

Carbon Disulifide (a non priority volatile) was also found.

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ANNOTATED SITE CHRONOLOGY

Combe Fill South Landfill[a]
(Excluding related sampling events)[b]

DATE	EVENT
1940s	Small fill operation owned and operated by Filiberto family.
1970-1971	Landfill operated by Filiberto Sanitation, Incorporated.
Jul 1972	Fish kill in Trout Brook prompts Division of Fish and Game to request geologic investigation.
12 Dec 1972	"Certificate of Registration" issued to Chester Hills Incorporated for sanitary landfill operation on Parker Road in Chester Township.*
Feb 1973	Analyses by Washington Township completed for samples of 2 springs on the Tingue property.
18 Mar 1973	Inspection of Trout Brook to landfill by Chester officials leading to letter requesting action on part of New Jersey Department of Environmental Protection (NJDEP) to stop pollution of brook.
29 May 1973	Investigation of Trout Brook headwaters by NJDEP.
23 Jul 1973	Site inspection by NJDEP and Chester Township of Trout Brook and Tingue well. High bacterial counts were found in Trout Brook leading to recommendations for additional leachate treatment and recycling.
Jul 1973	Chester Hills, Incorporated installs leachate collection and recirculation system.
6 Aug 1974	NJDEP proposes locations of first four monitoring wells.

[a]Revisions and updates made to original chronology presented in RAMP.
[b]Summary of sampling events in association with the landfill are summarized in Appendix BB.

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*Note: Bulk of the post-1972 landfilled area is in Washington Township. Much of the area planned for use in Chester Twp. never was. ("Planned" [illegible] mainly [illegible])

ANNOTATED SITE CHRONOLOGY

Combe Fill South Landfill[a]
(Excluding related sampling events)[b]

DATE	EVENT
1976	Leachate collection and pumping system becomes inactive.
1977	After much discussion, Chester Hills installs two observation wells.
27 Jan 1977	Chester Hills begins sampling of site monitoring wells for metals, phenols, cyanide, and conventional sanitary constituents; sampling continues every few months until May 1981 with some changes in sample location/designation.
5 Sep 1978	Combe Fill, Incorporated submits "Application of Notification of Change in Ownership" to Solid Waste Administration.
15 Jan 1979	Sparks from operating doser ignite aerosol cans of hairspray, resulting in explosions and small fires.
26 Sep 1979	Combe Fill Corporation cited for exceeding maximum allowable width of operating face, for inadequate daily cover, and for excavation of previously deposited refuse at Combe Fill South Landfill.
12 May 1980	Chester Township files civil complaint against Combe Fill Corporation seeking to stop construction of a new access road. Judge Reginald Stanton issues restraining order against use of road.
Dec 1980	Local citizens discover clearing of trees in preparation for filling in wetland area to west of site.
1981	Chester Township Health Department steps up surveillance of landfill activities.

[a]Revisions and updates made to original chronology presented in RAMP.
[b]Summary of sampling events in association with the landfill are summarized in Appendix BB.

ANNOTATED SITE CHRONOLOGY

Combe Fill South Landfill[a]
(Excluding related sampling events)[b]

DATE	EVENT
31 Jan 1981	Combe Fill North Landfill closes, increasing truck traffic and aggravating problems at Combe Fill South Landfill.
6-19 Feb 1981	Local citizens, township leaders, and environmental activist groups file protest with NJDEP director because of Combe Fill Corporation's activities in the wetland.
23 Feb 1981	Chester and Washington Townships seek injunction against Combe Fill Corporation in Superior Court to prevent company from advancing fill into wetland area. Judge Stanton orders Combe Fill to halt wetland operations for two weeks.
8 Mar 1981	Court reverses restraining order and permits clearing of wetland and other preparations but prohibits waste disposal in wetland for 30 days.
19 Mar 1981	NJDEP issues an "Order Modifying Registration" requiring the suspension of operations in the wetland until Combe Fill Corporation submits a revised design showing use of clean fill in the wetland, leachate collection systems, impermeable barriers, and additional monitoring wells that would provide for secure disposal.
19 Mar 1981	U.S. Environmental Protection Agency issues citation to Combe Fill Corporation for violation of Section 301(a) of the Clean Water Act, orders them to cease wetland activities, and requires them to obtain a Section 404 permit.
24 Mar 1981	In a final ruling Judge Stanton orders that:
	(1) NJDEP designate areas suitable for fill

[a]Revisions and updates made to original chronology presented in RAMP.
[b]Summary of sampling events in association with the landfill are summarized in Appendix BB.

ANNOTATED SITE CHRONOLOGY

Combe Fill South Landfill[a]
(Excluding related sampling events)[b]

DATE	EVENT
	(2) Sediment erosion permits under CWA are not applicable
	(3) NJDEP appoint an impartial project manager to oversee problems and complaints
	(4) NJDEP and Combe Fill Corporation decide whether wetland dumping is permissible
10 May 1981	Combe Fill Corporation cited for failure to control littering, for improper grading, and for insufficient thickness of daily cover at Combe Fill South.
15 May 1981	NJDEP sets forth procedures for delineating wetland at site.
22 May 1981	Last recorded sampling and analyses of monitoring wells on site by Combe Fill Corporation.
8 Jun 1981	Combe Fill Corporation cited for failure to control littering and for inadequate daily cover at Combe Fill South Landfill.
28 Jul 1981	Combe Fill Corporation cited for inadequate cover at Combe Fill South.
17 Aug 1981	Combe Fill Corporation attorneys announce rate increase hearings with NJPUC scheduled for 18-21 August and 8-10 September 1981.
18 Sep 1981	Based on groundwater sampling on and around Combe Fill South Landfill, NJDEP issues a second "Order Modifying Registration" stating that groundwater contamination exists at the landfill and is likely to contaminate local water supplies. NJDEP orders that:

[a]Revisions and updates made to original chronology presented in RAMP.
[b]Summary of sampling events in association with the landfill are summarized in Appendix BB.

ANNOTATED SITE CHRONOLOGY

Combe Fill South Landfill[a]
(Excluding related sampling events)[b]

DATE	EVENT
	(1) Combe Fill Corporation submit revised engineering design including plan for proper closure and groundwater monitoring
	(2) Combe Fill South Landfill operation cease acceptance of all waste upon filling to elevations as marked by SWMA
	(3) Combe Fill Corporation ensure that revised design meets requirements of revised Solid Waste Management Act
Sep to Oct 1981	Strong winds limit acceptance of waste at Combe Fill South Landfill.
Oct 1981	Combe Fill Corporation officially declares bankruptcy and ceases acceptance of waste. Chester Township and NJDEP official temporarily assume responsibility of landfill. Landfill technically open.
13 Oct 1981	Combe Fill South cited for failure to apply adequate cover.
30 Nov 1981	Official closure of Combe Fill South.
18 Dec 1981	Combe Fill South cited for failure to limit size of working face, failure to control littering, and failure to apply adequate cover.
10 May 1982	Combe Fill South cited for failure to control litter and failure to apply final cover.
29 Jun 1982	Geologic reconnaissance at Combe Fill South.
Aug 1982	Terrain conductivity investigation at Combe Fill South.

[a]Revisions and updates made to original chronology presented in RAMP.
[b]Summary of sampling events in association with the landfill are summarized in Appendix BB.

ANNOTATED SITE CHRONOLOGY

Combe Fill South Landfill[a]
(Excluding related sampling events)[b]

DATE	EVENT
12 Aug 1982	Mitre Ranking Form submitted by NJDEP to U.S. EPA.
20 Dec 1982	Combe Fill South proposed for inclusion on National Priorities List (Superfund Sites)
22 Dec 1982	Combe Fill Corporation bankruptcy hearing.
8 Sep 1983	Combe Fill South on the National Priorities List.
Dec 1983	Remedial Action Master Plan (RAMP) prepared for Combe Fill South.
Jul 1984	NJDEP awards remedial investigation/feasibility study (RI/FS) contract to consultant.
Sep 1984 to Jan 1985	Borings made on site and new monitoring wells installed as part of RI/FS.
Apr 1985 to Nov 1985	On-site environmental monitoring conducted and analyses performed as part of RI/FS.

[a]Revisions and updates made to original chronology presented in RAMP.
[b]Summary of sampling events in association with the landfill are summarized in Appendix BB.

CHRONOLOGY OF ENVIRONMENTAL SAMPLING IN AND AROUND SITE

Combe Fill South Landfill[a,b]

DATE	SAMPLER	SAMPLED MEDIA	ANALYSES CONDUCTED
15 Nov 1973	NJDEP	Residential wells and surface waters (Trout Brook)	Metals, conventional pollutants[c], phenols, and cyanide for surface water
26 Jul 1974	NJDOH	Surface waters (tributaries and ponds)	(Unknown - data not available)
8 Aug 1980	Washington Township	Surface waters (Trout Brook)	Metals, phenols, cyanide
10 Sep 1980	Chester Health Dept.	Combe monitoring wells	Metals
16 Oct 1980	Washington Township	Surface waters (Trout Brook)	Metals, coliform
28 Oct 1980	Borough of Madison	Residential wells	Metals, coliform, pH
6 Jan 1981	NJDEP	Combe monitoring wells	Metals
2 Feb 1981	Chester Health Dept.	Residential wells	Metals

[a]Excluding sampling by Chester Hills Corp. and Combe Fill Corp., operators of site.
[b]Excluding sampling associated with Remedial Investigation (see Chapter 1 of main text for this information).
[c]Conventional pollutants may include BOD_5, total suspended solids, COD, total organic carbon, etc.
[d]VOA = Volatile organics.
Acid = Acid extractable organics.
B/N = Base/neutral extractable organics.
Full PP = All priority pollutants.
PCB = Polychlorinated biphenyls.

CHRONOLOGY OF ENVIRONMENTAL SAMPLING IN AND AROUND SITE

Combe Fill South Landfill[a,b]

DATE	SAMPLER	SAMPLED MEDIA	ANALYSES CONDUCTED
3 Mar 1981	NJDEP	Surface waters leachate, and monitoring wells	VOA, B/N, metals, cyanide, conventional pollutants
3 Mar 1981	Borough of Madison	Residential wells	Metals, pH
23 Mar 1981	URWA	Surface waters/ leachate, Combe monitoring wells	Full PP, conventional pollutants, radio-activity
24-28 Mar 1981	Chester Health Dept.	Residential wells	Metals
28-30 Apr 1981	NJDEP	Surface water	Full PP
6 May 1981	NJDEP	Combe monitoring wells; residential wells	Metals, cyanide
28 May 1981	HALT	Residential wells	VOA, manganese
8-22 Jun 1981	HALT	Residential wells	VOA
12 Jun 1981	NJDEP	Residential wells	Acid, B/N, pesti-cides, PCB, metals, phenol, cyanide, chloride

[a]Excluding sampling by Chester Hills Corp. and Combe Fill Corp., operators of site.
[b]Excluding sampling associated with Remedial Investigation (see Chapter 1 of main text for this information).
[c]Conventional pollutants may include BOD_5, total suspended solids, COD, total organic carbon, etc.
[d]VOA = Volatile organics.
Acid = Acid extractable organics.
B/N = Base/neutral extractable organics.
Full PP = All priority pollutants.
PCB = Polychlorinated biphenyls.

CHRONOLOGY OF ENVIRONMENTAL SAMPLING IN AND AROUND SITE

Combe Fill South Landfill[a,b]

DATE	SAMPLER	SAMPLED MEDIA	ANALYSES CONDUCTED
12 Jun 1981	Jason Cotrell & Assoc.	Residential wells	Acid, B/N, pesticides, PCB, metals, phenol, cyanide, chloride
7 Jul 1981	Chester Health Dept.	Residential wells	Metals
10 Jul 1981	Chester Estates	Residential wells	Conventional pollutants
17 Jul 1981	NJDEP	Residential wells	VOA
28 Jul 1981	Chester Health Dept.	Residential wells	Conventional pollutants
1 Aug 1981	Chester Health Dept.	Residential wells	Heptachlor, heptachlor epoxide
9 Aug 1981	Townly Research (for Chester Health Dept.)	Residential wells	VOA
25 Aug 1981	Borough of Madison	Surface waters	Tannins
11 Sep 1981	Chester Health Dept.	Residential wells	Selenium
24 Sep 1981	NJDEP	Residential wells	Lead

[a]Excluding sampling by Chester Hills Corp. and Combe Fill Corp., operators of site.
[b]Excluding sampling associated with Remedial Investigation (see Chapter 1 of main text for this information).
[c]Conventional pollutants may include BOD_5, total suspended solids, COD, total organic carbon, etc.
[d]VOA = Volatile organics.
Acid = Acid extractable organics.
B/N = Base/neutral extractable organics.
Full PP = All priority pollutants.
PCB = Polychlorinated biphenyls.

CHRONOLOGY OF ENVIRONMENTAL SAMPLING IN AND AROUND SITE

Combe Fill South Landfill[a,b]

DATE	SAMPLER	SAMPLED MEDIA	ANALYSES CONDUCTED
8 Jun 1982	NJDEP	Residential wells with water filters	Conventional pollutants, metals, phenol, cyanide
16 Mar 1983	Chester Health Dept.	Leachate	VOA, metals, conventional pollutants
3 Feb 1984	NJDEP	Surface waters, residential wells	Full PP
9 Feb 1984	NJDEP	Surface waters	Full PP
16 Mar 1984	Borough of Madison	Residential wells	VOA
13 Apr 1984	NJDEP	Residential wells	Full PP
17 Jul 1984	Borough of Madison	Residential wells	VOA
21 Mar 1985	NJDEP	Residential wells, surface waters	Full PP

[a]Excluding sampling by Chester Hills Corp. and Combe Fill Corp., operators of site.
[b]Excluding sampling associated with Remedial Investigation (see Chapter 1 of of main text for this information).
[c]Conventional pollutants may include BOD_5, total suspended solids, COD, total organic carbon, etc.
[d]VOA = Volatile organics.
Acid = Acid extractable organics.
B/N = Base/neutral extractable organics.
Full PP = All priority pollutants.
PCB = Polychlorinated biphenyls.

APPENDIX CC

CHEMICAL ANALYSES

INTRODUCTION

Appendix CC contains all sample chemistry data analyzed as part of this RI/FS on the Combe Fill South Landfill and any such data obtained during previous investigations of the landfill. The data have been organized to correspond to their discussion in the text and the following Table of Contents for this Appendix lists these data tables.

SAMPLE ANALYSIS

The samples collected as part of this RI/FS were analyzed for the full priority pollutant scan (full PP) of chemicals plus forty tentatively identified compounds (+40). The priority pollutant scan consists of 28 volatile compounds, 11 acid/phenolic extractable organics, 46 base/neutral extractable organics, 25 pesticides/PCBs, 13 metals, and total phenolics and cyanide for a total of 125 compounds. The chemical 2,3,7,8-tetrachloro-dibenzo-p-dioxin (Dioxin), which is a priority pollutant, was not analyzed because it was not suspected to be present. The priority pollutant organics are identified by comparison of the sample spectrum to that of the known compound. A match of the spectra identifies the compound. The concentration of the compound is determined by comparing its peak height to the peak height of its standard on the mass spectrophotometer. Total phenol and cyanide are determined by wet chemistry methods, and the metals concentrations are determined by atomic adsorption spectrophotometry.

The forty tentatively identified compounds, consisting of 15 volatiles, 10 acid/phenolic extractables, and 15 base/neutral extractables, are selected on the basis of their estimated quantities. The spectra of greatest approximate quantity are selected by the analytical computer for tentative identification. These compounds are identified by comparing the individual spectrum to those spectra in the mass spectral library of the analytical computer. The computer selects the three most likely matches; the analyst makes the final determination on the identification. Because not all chemical spectra are included in the analytical library, the spectral match is only a "best fit" and is therefore identified as tentative. If no likely match is found, the compound is identified as an unknown. The concentration of the compound is estimated by comparing its peak height to that of the known internal standard. The concentration is computed based on the relative size; hence, the reason why the method is referred to as semi-quantitative.

REMEDIAL INVESTIGATION (RI) DATA TABLE FORMAT

The individual compounds were identified under their respective groups, i.e., volatiles, acid/phenolics, base/neutrals, pesticides/ PCBs, metals. In reporting the data, only those compounds detected in at least one sample on the page are reported. Cyanide and phenols are listed under the group "Miscellaneous" and are listed whether or not they are detected. The values for compounds are reported in three ways: (1) a numerical value = concentration, (2) ND = not detected, or (3) BM = below method detection limit. If a compound is listed as BM it means that the compound is detected but at a unquantifiable level below the method detection level. The detection level is listed next to the BM; therefore, BM @ 10 means the compound is detected but at a level below 10 ppb. If no compound was detected within a particular group, an ND appears next to the group name. The column next to a particular group or compound is left blank when that analysis was not done.

The tentatively identified compounds are subdivided into the three appropriate groups - volatiles, acid/phenolics, and base/neutrals. If a particular compound is identified, it is listed along with its

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estimated concentration; conversely, if it is not identified, a (-) is used to indicate that it was not found. If no compounds are identified within a group, a notation of "NF," meaning none found, is used.

Conventional sanitary and radioactivity analyses are listed under separate headings. Since most of these analyses are wet chemistry methods, the results are reported as < a detection limit instead of as ND. Again, a blank means the analysis was not done.

The subcontractor laboratories used during this RI/FS, primarily Environmental Testing and Certification (ETC) and U.S. Testing (UST), analyzed for some compounds that are either no longer, or never were, on the priority pollutant list. These compounds are listed with the priority pollutant organics in the data tables with footnotes indicating that they are not priority pollutants. The non-priority metals are listed under a separate heading "non-priority metals."

For all water and soil samples, concentrations of organic compounds, cyanides, and phenols are reported in parts per billion (ppb); metals and radioactivity are reported in parts per million (ppm) and picocuries per liter (pCi/l), respectively. Conventional sanitary analyses are reported in ppm except where noted. All chemical concentrations in air are reported in $\mu g/m^3$. The quality control data for the air quality samples are reported as μg/tube or μg/filter, depending on which analysis was performed.

PREVIOUS SAMPLING DATA

The data that have been collected by previous investigators have also been summarized. The sampling dates for these samples are listed in Appendix BB. The data are presented in a fashion similar to that for the RI/FS data described above. The data are organized by chemical group and only those compounds that were detected are reported. A blank indicates that the compound or group was not analyzed. For each station the range, average, and number of analyses are presented for each compound. In computing the average a zero is used for ND and a value of 1/2 the detection limit is used for BM. Chemical concentrations are reported in the same units for the previously sampled data as for the RI data described above. Non-priority metals and organics that were quantified are listed as "Other Metals" and "Other Organics," respectively.

As stated previously, the data are presented in the order in which they are discussed in the text. Thus, the soil data are presented first (soil boring/rock coring data, hand augered soil samples, and test pit data), groundwater samples second (monitoring well and potable well), leachate and surface water samples third, air quality samples fourth, and finally quality assurance/quality control (QA/QC) data for the various sample matrices (aqueous, soil/sediment, air). For the leachate and surface water surveys, the data are presented in the following order: RI/FS aqueous data, RI/FS sediment data, previous aqueous data, and previous sediment data.

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Appendix CC

TABLE OF CONTENTS
(Continued)

Appendix CC

TABLE CC-1 (Page 1 of 3)

SUMMARY OF SOIL BORING/ROCK CORING SAMPLES

Combe Fill South Landfill

PARAMETERS	PIEZOMETER SB-2 SAMPLE INTERVAL, FT 36-38	42-48	PIEZOMETER SB-3 SAMPLE INTERVAL, FT 12-14	28-30	PIEZOMETER SB-4 SAMPLE INTERVAL, FT 14-16	22-44
DATE SAMPLED	11/21/84	11/21/84	11/15/84	11/15/84	11/27/84	11/27/84
VOLATILES, ppb						
Carhon tetrachloride	ND	ND	ND	350	ND	ND
Chloroform	580	680	ND	530	6000	5600
Methylene chloride	3360	3900	ND	610	ND	ND
Tetrachloroethylene	ND	ND	810	ND	1400	ND
Toluene	400	500	960	470	3000	ND
ACID/PHENOLICS, ppb						
Pentachlorophenol	ND	BM @ 825	BM @ 825	BM @ 825	BM @ 825	ND
Phenol	ND	ND	BM @ 825	ND	ND	ND
BASE/NEUTRALS, ppb						
Butyl benzylphthalate	350	ND	ND	ND	ND	ND
Diethylphthalate	BM @ 330	ND	ND	ND	ND	ND
Di-n-butylphthalate	500	720	6000	450	560	570
Phenanthrene	BM @ 330	ND	ND	ND	ND	ND
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND
METALS, ppm						
Arsenic	2.6	2.6	2.9	2.4	ND	ND
Cadmium	1.1	4.7	3.7	2.4	1.1	3.4
Chromium	ND	ND	ND	5.9	ND	ND
Copper	3.9	120.0	56.0	31.0	20.0	71.0
Nickel	ND	5.0	ND	ND	6.4	14.0
Zinc	16.0	61.0	91.0	ND	13.0	38.0
MISCELLANEOUS, ppb						
Cyanides	ND	ND	ND	ND	ND	ND
Phenols	ND	ND	ND	ND	ND	ND

ND = Not detected.
BM = Below method detection limit.

TABLE CC-1 (Page 2 of 3)

SUMMARY OF SOIL BORING/ROCK CORING SAMPLES

Combe Fill South Landfill

PARAMETERS	PIEZOMETER SB-2 SAMPLE INTERVAL, FT 36-38	42-48	PIEZOMETER SB-3 SAMPLE INTERVAL, FT 12-14	28-30	PIEZOMETER SB-4 SAMPLE INTERVAL, FT 14-16	22-44
DATE SAMPLED	11/21/84	11/21/84	11/15/84	11/15/84	11/27/84	11/27/84
TENTATIVELY IDENTIFIED VOLATILES, ppb						
Unknown(s)	-	-	2500, 2100	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon TF)	2550	2700	16000	12000	50000	68000
Arsenous acid, tris (trimethylsilyl) ester	1700	3300	-	-	-	-
1-(3.Beta.)-cholest-5-en-3yl)-2-pyrrolidinone	-	-	2200	-	-	-
3-Fluoro-2-propynenitrile	-	-	2600	-	-	-
Isocyanatomethane	-	-	18000	-	5500	39000
1-3-Dichlorocyclobutane	-	-	5100	-	-	-
Tetrahydre-2-(iodomethyl)-6-methoxy-2H-pyran-4-ol	-	-	8400	-	-	-
1,4-Phenylenebis [trimethy] silane	-	-	34000	-	-	-
1,1[1]-(1,2-Ethanediyl) bis-naphthalene	-	-	4600	-	-	-
3,4-Dihydro-3,4-dihydroxy-2-methyl-2H-naphtho [2,3,3] furon-S-iodione	-	-	4100	-	-	-
5-Ethoxy-1-(phenylmethyl) 1-H-benzenedazol-4-ol	-	-	4900	-	-	-
1,2,3,4-Tetramethyl-trans cyclobutene	-	-	4600	-	-	-
1-Fluoro-4-methoxy-benzene	-	-	3000	-	-	-
TENTATIVELY IDENTIFIED ACIDS/BASE/NEUTRALS, ppb						
Unknown(s)	-	540, 360, 120	33000, 170000, 5300	580, 340	-	380
1-(1,1-Dimethylethyl)-2-methyl-1,3-propane-2-methyl-propanoic acid	930	-	-	-	1000	1200
4,5,6,7-Tetrahydro-2,2-methyl-1H-1,3-diazepine	24000	-	-	-	-	-
Dioctylester hexanedioic acid	-	860	6700	810	1400	-

- = Not found.

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TABLE CC-1 (Page 3 of 3)

SUMMARY OF SOIL BORING/ROCK CORING SAMPLES

Combe Fill South Landfill

PARAMETERS	PIEZOMETER SB-2 SAMPLE INTERVAL, FT		PIEZOMETER SB-3 SAMPLE INTERVAL, FT		PIEZOMETER SB-4 SAMPLE INTERVAL, FT	
	36-38	42-48	12-14	28-30	14-16	22-44
DATE SAMPLED	11/21/84	11/21/84	11/15/84	11/15/84	11/27/84	11/27/84
TENTATIVELY IDENTIFIED ACIDS/BASE/ NEUTRALS, ppb (Continued)						
Bis (2-Methylpropyl) ester 2-butenedioic acid(e)	-	160	-	-	-	-
4-Methylphenol	-	-	8300	-	-	-
2,6-Bis (1-dimethylethyl)- 4-methylphenol	-	-	17000	-	-	-
Tricarbonyl [N-(phenyl-2- pyridinylmethylene) benza- mine, N, N[1]] iron	-	-	6200	-	-	-
Trans-decahydro-10A-methyl- benzocyclo octenone	-	-	38000	680	-	-
Heneicosane	-	-	8100	-	-	-
2,5-Dimethyl phenanthrene	-	-	5900	-	-	-
2,3-Dimethyl phenanthrene	-	-	4400	-	-	-
Doscosane	-	-	8900	-	-	-
2,6,10,15-Tetramethyl heptadecane	-	-	9600	-	-	-
1-Dotriacontanol	-	-	18000	-	-	-
2,3-Dihydro-2-methyl-5-phenyl- benzofuran	-	-	21000	-	-	-
4-Methyl-2-hexanol	-	-	-	340	-	-
Dicyclohexyl ester hexanedioic acid	-	-	-	-	-	610
Silver (1+) salt benzene- propanoic acid	-	-	-	-	-	360
6-Deoxy-3-O-methyl 1-glucose	-	-	-	-	-	360

- = Not found.

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TABLE CC-2 (Page 1 of 3)

SUMMARY OF SOIL DATA ON HAND AUGERED SOIL SAMPLES

Combe Fill South Landfill

PARAMETER	FIELD A 4 WHITE	FIELD A A HORIZON COMPOSITE	FIELD A B HORIZON COMPOSITE	FIELD A (LOC 5) B HORIZON	FIELD B (LOC 5) B HORIZON	FIELD B (LOC 6) A HORIZON	FIELD B (LOC 3) A HORIZON	FIELD B A HORIZON COMPOSITE	FIELD B B HORIZON COMPOSITE	FIELD C A HORIZON COMPOSITE	FIELD C B HORIZON COMPOSITE	FIELD A (LOC 6) A HORIZON
DATE SAMPLED	8/21/85	8/22/85	8/22/85	8/21/85	8/22/85	8/22/85	8/22/85	8/22/85	8/22/85	8/23/85	8/23/85	8/21/85
VOLATILES, ppb												
Acetone[a]	50000	ND	120	110	ND	210	190	61	180	ND	160	170
Carbon disulfide[a]	ND	ND	ND	ND	ND	ND	ND	ND	ND	3[c]	16	6
Methylene chloride	580[b]	3[b,c]	3[b,c]	4[b,c]	4[b,c]	5[b]	6[b]	6[b]	6[b]	8[b]	11[b]	8[b]
Tetrachloroethylene	ND	ND	ND	ND	4[c]	3[b,c]	6[b]	3[b,c]	3[b,c]	6[b]	5[b]	5[b,c]
ACID/PHENOLICS, ppb												
Pentachlorophenol	ND	150[c]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BASE/NEUTRALS, ppb												
Benzo (A) pyrene	310[c]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	1200	2200	150[c]	960	110[c]	110[c]	150[c]	110[c]	150[c]	330[c]	240[c]	770
Di-n-butyl phthalate	160[b,c]	ND	ND	ND	ND	ND	ND	110[d]	ND	ND	ND	ND
Di-n-octyl phthalate	ND	150[c]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PESTICIDES/PCBs, ppb												
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17
METALS, ppm												
Arsenic	12	18	26	29	26	18	18	21	23	12	9.7	20
Beryllium	ND	3.0	1.6	3.3	1.1	1.4	1.2	1.5	1.0	1.0	1.0	1.7
Cadmium	4.7	3.9	1.9	3.1	2.0	4.0	2.4	2.8	3.2	2.0	2.1	2.7
Chromium	33	57	50	46	22	22	21	21	27	12	9.1	25
Copper	33	57	35	74	40	22	26	24	22	15	7.0	20
Lead	37	27	14	17	14	25	26	29	11	16	9.7	2
Mercury	ND	ND	ND	ND	ND	0.1	0.1	0.1	0.1	0.2	0.1	0.1
Nickel	15	17	14	21	10	13	9.0	14	12	ND	ND	13
Silver	ND	ND	ND	ND	41	ND	ND	ND	ND	ND	ND	ND
Thallium	ND	3.6	5.1	4.5	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	48[c]	67	52	60	8310	62	60	62	44	46	33	54

[a]Non-priority organic quantified.
[b]Found in method blank.
[c]Estimated value. Value is below method detection limit.
ND = Not detected.

TABLE CC-2 (Page 2 of 3)

SUMMARY OF SOIL DATA ON HAND AUGERED SOIL SAMPLES

Combe Fill South Landfill

PARAMETER	FIELD A (LOC 4) WHITE	FIELD A A HORIZON COMPOSITE	FIELD A B HORIZON COMPOSITE	FIELD A (LOC 5) B HORIZON	FIELD B (LOC 5) B HORIZON	FIELD B (LOC 6) A HORIZON	FIELD B (LOC 3) A HORIZON	FIELD B A HORIZON COMPOSITE	FIELD B B HORIZON COMPOSITE	FIELD C A HORIZON COMPOSITE	FIELD C B HORIZON COMPOSITE	FIELD A (LOC 6) A HORIZON
DATE SAMPLED	8/21/85	8/22/85	8/22/85	8/21/85	8/22/85	8/22/85	8/22/85	8/22/85	8/22/85	8/23/85	8/23/85	8/21/85
MISCELLANEOUS, ppb												
Cyanides	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenols	ND	ND	ND	ND	ND	1000	ND	ND	1200	ND	ND	ND
TENTATIVELY IDENTIFIED VOLATILES, ppb					NF							
Unknown(s)	-	8,25	6,24	6,25		7,13,6	15,15,6	5	19,25	8	12	8
2-propanol	625	-	-	-		-	-	-	-	-	-	-
Trimethylsilanol	-	8	9	2		-	-	-	17	-	22	15
TENTATIVELY IDENTIFIED ACIDS/BASE/ NEUTRALS, ppb												
Unknown(s)	3900,2860, 11440,1560, 22880,624, 2246,1248, 2445,590, 2424,1040, 520,780,936, 1716,12986	1340,600, 540	1440,1060, 990,5550, 11600,760, 1370,3040, 3950,4640, 4710,4180, 2890,2050, 1220	6900,820	540,1030	20300, 4980,940, 1480,810	1060, 13700, 1110,850, 300	820,5760, 700	5830, 910	740,5640, 1020	680, 6120	5040,600
3-Hexen-2-one	-	-	-	-	-	-	-	5590	-	7120	6410	4480
5- (2-Propenyl)-1,3-benzodioxole	-	-	-	-	-	4190	-	-	-	-	-	-
5-Methyl-3-hexen-2-one	-	690	-	-	-	-	-	-	-	-	-	-
2 (2-Hydroxypropoxy)-1 propanol	1820	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-3-penten-2-one	-	3180	5780	8070	10300	5380	-	-	-	-	-	-
4-Hydroxy-4-methyl-2-pentanone	-	2830	-	-	5650	-	1900	-	1010	-	-	-
4-Methyl octane	-	550	-	1290	-	-	-		-	-	-	-
3-Methyl octane	-	1570	3570	3510	4230	2290	3700	3210	4150	3150	3210	2480
1-Methylethyl benzene	-	690	420	17800	16400	11880	16100	12810	15300	14000	14700	12100

\- = Not found.
ND = Not detected.
NF = None found.

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TABLE CC-2 (Page 3 of 3)

SUMMARY OF SOIL DATA ON HAND AUGERED SOIL SAMPLES

Combe Fill South Landfill

PARAMETER	FIELD A (LOC 4) WHITE	FIELD A A HORIZON COMPOSITE	FIELD A B HORIZON COMPOSITE	FIELD A (LOC 5) B HORIZON	FIELD B (LOC 5) B HORIZON	FIELD B (LOC 6) A HORIZON	FIELD B (LOC 3) A HORIZON	FIELD B A HORIZON COMPOSITE	FIELD B B HORIZON COMPOSITE	FIELD C A HORIZON COMPOSITE	FIELD C B HORIZON COMPOSITE	FIELD A (LOC 6) A HORIZON
DATE SAMPLED	8/21/85	8/22/85	8/22/85	8/21/85	8/22/85	8/22/85	8/22/85	8/22/85	8/22/85	8/23/85	8/23/85	8/21/85
NON-PRIORITY METALS, ppm												
Aluminum	23800	49100	30800	43600	37000	28300	27200	27800	29900	20600	19400	24400
Barium	77	450	81	77	138	139	124	135	90	63	56	94
Calcium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	5.2	22	20	29	18	12	11	11	13	5.2	4.2	12
Iron	24000	46100	36600	59800	36300	30200	24300	27000	36100	18100	20000	27400
Magnesium	72200	6640	3720	3860	3620	2420	2260	2300	2950	1630	1560	2520
Manganese	351[a]	442	280	514	501	852	672	813	361	142	105	883
Potassium	10000	4300	2090	2040	1590	952	857	926	1020	731	612	798
Sodium	1880[a]	358	287	199	451	166	127	124	150	122	116	177
Tin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	48[a]	85	46	108	66	48	45	47	60	19	16	44
CONVENTIONALS												
pH (units)	8.18	5.90	6.70	6.05	6.30	5.47	5.70	5.80	6.12	5.88	6.35	6.00
Solids (%)	36	87	84	87	90	90	89	89	88	93	93	82

[a]Value is estimated because of interferences.
ND = Not detected.

TABLE CC-3 (Page 1 of 2)

SUMMARY OF SOIL DATA ON TEST PITS

Combe Fill South Landfill

PARAMETER	TP-1 COMPOSITE 0-9 FT	TP-1 DISCRETE 9-11 FT	TP-2 COMPOSITE 0-12 FT	TP-3 COMPOSITE 0-12 FT
DATE SAMPLED	8/27/85	8/27/85	8/27/85	8/27/85
VOLATILES, ppb				
Acetone[a]	ND	90[b]	52[b]	120[b]
2-Butanone[a]	ND	270	ND	ND
Methylene chloride	37[b]	100[b]	20[b]	23[b]
4-Methyl-2-pentanone[a]	ND	28	ND	ND
Tetrachloroethylene	5[b]	6[b]	6[b]	5[b]
ACIDS/PHENOLICS, ppb	ND	ND	ND	ND
BASE/NEUTRALS, ppb				
Bis (2-ethylhexyl) phthalate	120[c]	370[c]	1300	ND
PESTICIDES/PCBs, ppb				
Aldrin	ND	ND	132	ND
Dieldrin	ND	ND	76	ND
METALS, ppm				
Arsenic	71	52	42	38
Beryllium	1.5	1.5	1.5	1.0
Cadmium	2.9	ND	13	1.3
Chromium	22	19	24	16
Copper	34	26	37	20
Lead	ND	ND	30	10
Nickel	7.7	7.2	12	7.5
Zinc	47[d]	38[d]	148[d]	50[d]
MISCELLANEOUS, ppb				
Cyanides	ND	ND	ND	ND
Phenols	ND	ND	ND	ND

[a]Non-priority organic quantified.
[b]Found in method blank.
[c]Estimated value. Value is below method detection limit.
[d]Value is estimated because of interferences.

ND = Not detected.

TABLE CC-3 (Page 2 of 2)

SUMMARY OF SOIL DATA ON TEST PITS

Combe Fill South Landfill

PARAMETER	TP-1 COMPOSITE 0-9 FT	TP-1 DISCRETE 9-11 FT	TP-2 COMPOSITE 0-12 FT	TP-3 COMPOSITE 0-12 FT
DATA SAMPLED	8/27/85	8/27/85	8/27/85	8/27/85
TENTATIVELY IDENTIFIED VOLATILES, ppb				
Unknown(s)	11	9	11	27,12
Ethoxy benzene	-	-	-	30
Trimethyl silanol	13	-	16	28
Hexane	6	12	-	-
3-Methyl-2-butanone	-	6	-	-
TENTATIVELY IDENTIFIED ACIDS/BASE/NEUTRALS, ppb				
Unknown(s)	434,6080, 428,260	360,6500	5460,2040, 3100,3100, 3400,3120, 5300,2680, 2370,940, 560,1120,940, 1730,2400	1580,1750, 14900
4-Methyl-3-penten-2-one	2389	-	1290	-
3-Methyl octane	706	970	830	-
1-Methylethyl benzene	8360	9350	7100	5300
3-Hexane-2-one	-	3700	-	-
4-Hydroxy-4-methyl-2-pentanone	-	-	-	4900
Sulfur	-	640	-	-
NON-PRIORITY METALS, ppm				
Aluminum	53600	39900	29400	20400
Barium	123	170	104	64
Calcium	ND	ND	ND	ND
Cobalt	16	30	21	12
Iron	47600	37900	40400	29800
Magnesium	2100[a]	1360[a]	2710[a]	2300[a]
Manganese	298[a]	939[a]	380[a]	293[a]
Potassium	2090	1740	1960	1410
Sodium	197	108	219	186
Tin	ND	ND	ND	ND
Vanadium	69	52	64	43
CONVENTIONALS				
pH (Units)	4.85	5.20	6.36	7.05
Solids (%)	85	83	82	86

[a]Value is estimated because of interferences.
- = Not found.

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TABLE CC-4 (Page 1 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9
DATE SAMPLED	8/28/85	8/28/85	9/4/85	8/28/85	8/28/85	8/29/85	9/4/85	9/4/85	9/4/85
VOLATILES, ppb									
Benzene	ND	ND	ND	ND	16.9	39.1	66.4	31.5	18.6
Chlorobenzene	ND	ND	ND	ND	ND	BM @ 6	9.88	10.8	ND
Chloroethane	ND	ND	ND	ND	ND	ND	22.5	74.3	BM @ 10
Chloroform	ND	209	ND	82.6	ND	ND	ND	ND	ND
Dichlorodifluoromethane[a]	ND	23.7	ND	ND	14.0	13.8	ND	13.5	84.8
1,1-Dichloroethane	ND	6.41	ND	ND	10.6	BM @ 4.7	ND	14.8	30.2
1,2-Dichloroethane	ND	7.98	ND	ND	40.5	37.2	ND	11.2	4.54
1,1-Dichloroethylene	ND	6.41	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	BM @ 6	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	34.2	11.7	ND
Methylene chloride	5.92	183	19.8	ND	16.7	10.4	23.8	22.6	16.4
Tetrachloroethylene	ND	14.3	ND	ND	6.89	BM @ 4.1	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	1140	ND	ND
Trans-1,2-dichloroethylene	ND	ND	ND	5.40	25.8	47.5	ND	ND	ND
Trichloroethylene	ND	8.34	ND	ND	2.72	26.0	ND	ND	ND
Trichlorofluoromethane[a]	ND	BM @ 10	ND	10.9	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	BM @ 10	ND	ND	ND
ACID/PHENOLICS, ppb									
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	3.12	ND
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	BM @ 3.7	ND
Phenol	ND	2.35	ND	ND	2.75	ND	ND	ND	ND
BASE/NEUTRALS, ppb									
Bis (2-chloroethyl) ether	ND	ND	ND	ND	ND	ND	ND	BM @ 5.9	ND
Bis (2-ethylhexyl) phthalate	BM @ 11	ND	ND	BM @ 10	ND	BM @ 11	ND	BM @ 10	BM @ 10
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	5.58	1.92
1,4-Dichlorobenzene	ND	BM @ 4.6	ND	ND	BM @ 4.5	ND	ND	14.2	ND
Di-ethyl phthalate	ND	ND	ND	ND	BM @ 10	ND	ND	BM @ 10	ND
Di-n-butyl phthalate	BM @ 11	ND	ND	BM @ 10	BM @ 10	ND	ND	BM @ 10	BM @ 10
Di-n-octyl phthalate	BM @ 11	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ND	21.9	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	3.24	ND
N-nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	BM @ 2	ND

[a]Non-priority organic quantified.
ND = Not detected.
BM = Below method detection limit.

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TABLE CC-4 (Page 2 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9
DATE SAMPLED	8/28/85	8/28/85	9/4/85	8/28/85	8/28/85	8/29/85	9/4/85	9/4/85	9/4/85
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND
METALS, ppm									
Arsenic	ND	ND	ND	ND	BM @ 0.01	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	BM @ 0.002	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	ND	ND	ND	ND	ND	ND	BM @ 0.01
Copper	0.04	0.007	0.03	BM @ 0.006	BM @ 0.006	BM @ 0.006	0.02	BM @ 0.009	BM @ 0.009
Lead	0.009	BM @ 0.005	0.01	BM @ 0.005	0.008	0.008	0.007	BM @ 0.005	0.014
Mercury	BM @ 0.0002	0.0002	ND	BM @ 0.0002	BM @ 0.0002	BM @ 0.0002	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	0.02	ND	ND
Selenium	ND	BM @ 0.005	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	BM @ 0.01	BM @ 0.01	ND
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	0.02	0.03	BM @ 0.04	ND	0.09	0.02	0.38	BM @ 0.04	0.07
MISCELLANEOUS, ppb									
Cyanides	ND	29.5	ND	ND	ND	ND	ND	ND	ND
Phenols	ND	ND	ND	ND	ND	ND	428	ND	ND
TENTATIVELY IDENTIFIED VOLATILES, ppb	NF	NF	NF	NF					
Unknown(s)					174	-	32.4, 25	-	-
Dichlorofluoromethane					-	33.6	-	34.6	46.8
Methoxy ethane					-	11.8	-	-	-
Carbon disulfide					-	38.8	-	-	-
1,1'-Oxybis ethane					-	65.5	312	561.0	108.0
2,4-Dimethyl-2-pentanol					-	-	-	28.8	-
Trimethyl-silanol					-	-	33	30.4	-
2,2'-oxybis-propane					-	-	-	29.2	-
1,3-Dichlorobenzene					-	-	52.6	35.8	-
Dichlorobenzene					-	-	-	-	-
2-Butanol					-	-	51.6	-	-
2-Hexanone					-	-	-	-	-
1,4-Dioxane					-	-	-	-	-
2-Propanone					-	-	84	-	-
Tetrahydrofuran					-	-	193	-	-
2-Butanone					-	-	418	-	-
4-Methyl-2-pentanone					-	-	219	-	-
1,3,3-Trimethyl-2-oxabicyclo [2.2.2]-octane					-	-	36.6	-	-

\- = Not found.
NF = None found.
ND = Not detected.
BM = Below method detection limit.

302569

TABLE CC-4 (Page 3 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9
DATE SAMPLED	8/28/85	8/28/85	9/4/85	8/28/85	8/28/85	8/29/85	9/4/85	9/4/85	9/4/85
TENTATIVELY IDENTIFIED ACIDS, ppb									
Unknown(s)	5.3	4.8, 7.4	4.6	4.7, 4.5	4.6, 15.9, 7.8, 7.0, 5.7	9.46, 16, 7.37, 6.25, 16.8, 61.5, 5.45	13.11, 26.95, 8.74, 8.56, 48.81	60, 41, 245, 42	168, 49, 231
Alcohol	6.1	6.6	-	6.0	-	-	-	-	-
2,4,6-(1H,3H,5H)-pyrimidinetrione, 5-ethyl-5-phenyl	-	17.8	-	-	-	18.3	-	-	-
3-Methoxy-1,1'-biphenyl	-	-	-	-	-	45.4	-	-	-
2-Methyl-benzenesulfonamide	-	-	-	-	-	4.47	-	-	-
Di-methylpropanoic acid	-	-	-	-	-	-	-	35	-
1,1-Dimethyl ethyl benzoic acid	-	-	-	-	-	-	-	33	74
1,1-Dioxide-1,2-benzisothrazol-one	-	-	-	-	-	-	-	108	-
Propanoic acid	-	-	-	-	-	-	-	-	23
Methylpropylester propanoic acid	-	-	-	-	-	-	-	-	64
Trichloromethane (chloroform)	-	-	-	-	-	-	-	-	-
Benzene	-	-	-	-	-	-	7.87	-	-
Cis-2-bromocyclohexanol	-	-	-	-	-	-	-	-	-
Fluorobiphenyl	-	-	-	-	-	-	-	-	-
2-Methylhexanoic acid	-	-	-	-	-	-	-	-	-
Benzenepropanoic acid	-	-	-	-	-	-	-	-	-
Dimethylethylmethyl-benzenamide	-	-	-	-	-	-	-	-	-
Ethylmethyl benzene-sulfonamide	-	-	-	-	-	-	-	-	-
Tetrahydromethoxy-pyridorndol-one	-	-	-	-	-	-	-	-	-
Trihydroxyxanthenone	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-
2,3-Dimethyl naphthalene	-	-	-	-	-	-	-	-	-
Acetic acid	-	-	-	-	-	-	8.66	-	-
Methylbenzene (toluene)	-	-	-	-	-	-	6.59	-	-
Methyl carboxylic acid	-	-	-	-	-	-	10.89	-	-
Unknown carboxylic acid	-	-	-	-	-	-	21.07	-	-

- = Not found.

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TABLE CC-4 (Page 4 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9
DATE SAMPLED	8/28/85	8/28/85	9/4/85	8/28/85	8/28/85	8/29/85	9/4/85	9/4/85	9/4/85
TENTATIVELY IDENTIFIED BASE/NEUTRALS, ppb						NF			
Unknown(s)	7, 5, 6, 4, 54	-	8	7.93	5.35		30.55, 15.62, 33.85, 19.35, 20.14, 19.68, 574.31	10,11 6, 8, 25, 26, 19, 29, 7, 13, 12	34.5, 4, 8, 23, 16, 8, 74
Methylbenzene (toluene)	64	57.2	-	58.97	57.24		-	-	-
Tetrachloroethene (tetrachloro-ethylene)	-	5.7	-	-	2.50		-	-	-
3,3,5-Trimethyl cyclohexanone	-	12.5	-	-	-		-	-	-
Dichloromethane (methylene chloride)	-	-	75	-	-		-	-	-
Dioctylesterhexanidioic acid	-	-	-	24.33	38.70		-	-	-
Dodecanoic acid	-	-	-	-	2.14		-	-	-
Tetraethylesterdiphosphoric acid	-	-	-	-	-		-	14	-
4-Ethoxybenzenamine	-	-	-	-	-		-	25	-
4-Chloro-2-methyl-benzenamine	-	-	-	-	-		-	9	-
N-(1,1-dimethylethyl)-3-methyl benzamide	-	-	-	-	-		-	21	29
Chlorobenzene	-	-	-	-	-		-	-	-
Dimethybenzene (xylene)	-	-	-	-	-		-	-	-
Trimethylester phosphoric acid	-	-	-	-	-		-	-	-
Trimethylbicycloheptanone	-	-	-	-	-		-	-	-
2,4,6-Cyclohepta-trien-1-one	-	-	-	-	-		-	-	-
2-Hexen-1-ol	-	-	-	-	-		63.21	-	-
2-Heptanone	-	-	-	-	-		16.50	-	-
1,3,3-Trimethyl bicyclo-[2.2.1] heptan-2-one	-	-	-	-	-		19.54	-	-
1,7,7-Trimethyl bicyclo-[2.2.1] heptan-2-one	-	-	-	-	-		93.46	-	-
5-Methyl-2-(1-methylethyl)-, (1.alpha., 2.beta., 5.alpha.)-cyclohexanol)	-	-	-	-	-		19.34	-	-
4-Methyl-1-(methylethyl)-3-cyclohexen-1-ol	-	-	-	-	-		18.61	-	-
Hexahydro-2H-azepin-2-one	-	-	-	-	-		14.33	-	-
1-[2-(1-Methoxy-1-methylethoxy)-1-methylethyl]-2-propanol	-	-	-	-	-		19.95	-	-

NF = None found.
- = Not found.

302571

TABLE CC-4 (Page 5 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9
DATE SAMPLED	8/28/85	8/28/85	9/4/85	8/28/85	8/28/85	8/29/85	9/4/85	9/4/85	9/4/85
CONVENTIONALS, ppm									
pH (units)	7.1	6.0	6.6	6.8	6.7	6.2	6.6	6.7	6.6
Temperature (°C)	14.1	14.1	16.7	14.4	15.0	25	20.4	19.9	19.2
Specific conductance (μmhos/cm) - field	95	270	125	100	380	650	3850	2020	1600
Nitrate as N		<0.1	<0.1			<0.1	<0.1	<0.1	<0.1
TOC		3.2, 3.0	1.7, 1.5			5.5, 5.3	440, 440	41, 40	24, 24
Specific conductance (μmhos/cm) - lab		300, 320	147, 142			497, 490	4000, 4000	2033, 2033	1688, 1688
BOD		<2	2			6	510	28	18
COD		15	7			14	1500	120	72
TSS		8	31			22	130	79	23
TDS		210	110			470	3900	1530	1400
Hardness		120	62			200	2100	680	790
Alkalinity		120	54			88	980	540	360
Ammonia as N		<0.05	<0.05			<0.05	0.29	0.29	<0.05
TKN		1.6	0.86			1.1	6.1	4.6	2.2
Total coliform (C/100 ml)		4	27			CFG	34	IND	10
Fecal coliform (C/100 ml)		0	0			0	0	0	0
RADIOACTIVITY, pCi/l									
Gross α		<0.8	2.3 ± 1.4			0.9 ± 1.8			
Gross β		2.5 ± 1.6	2.6 ± 1.6			3.5 ± 1.8			

Blank = Not run.
CFG = Confluent growth.
IND = Confluent growth without total coliforms.

302572

TABLE CC-4 (Page 6 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill (Page 6 of 10)

PARAMETER	S-1	S-2	S-3	S-4	S-5	S-6	DW-2	DW-4
DATE SAMPLED	9/4/85	9/5/85	8/29/85	9/4/85	8/28/85	8/28/85	9/5/85	9/5/85
VOLATILES, ppb								
Benzene	64.7	BM @ 4.4	80.2	BM @ 4.4	ND	BM @ 4.4	ND	252
Chlorobenzene	ND	30.3	21.1	18.2	ND	ND	ND	BM @ 6
Chloroethane	ND	ND	BM @ 10	62.0	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	57.5	ND	ND	155
Dichlorodifluoromethane[a]	BM @ 100	ND	89.7	ND	25.8	ND	ND	BM @ 10
1,1-Dichloroethane	65.2	ND	51.4	BM @ 4.7	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	6.10	ND	ND	ND	14.2
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	BM @ 6	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	BM @ 7.2	ND	ND	ND	ND	ND
Methylene chloride	59.8	5.84	29.8	12.0	11.6	11.6	10.7	22.0
Tetrachloroethylene	ND	ND	BM @ 4.1	ND	ND	ND	ND	5.58
Toluene	1370	ND	68.2	ND	ND	ND	ND	ND
Trans-1,2-dichloroethylene	ND	ND	8.02	ND	ND	ND	ND	17.5
Trichloroethylene	ND	ND	4.04	ND	ND	ND	ND	56.8
Trichlorofluoromethane[a]	ND	ND	ND	ND	BM @ 10	ND	ND	BM @ 10
Vinyl chloride	ND	ND	BM @ 10	ND	ND	ND	ND	BM @ 10
ACID/PHENOLICS, ppb								
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ND	ND	ND	BM @ 1.5	ND	ND	ND	ND
BASE/NEUTRALS, ppb								
Bis (2-chloroethyl) ether	ND	ND	ND	BM @ 5.8	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	ND	BM @ 11	ND	ND	BM @ 10	ND	ND	ND
1,2-Dichlorobenzene	ND	9.77	ND	7.25	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	39.4	ND	10.1	ND	ND	ND	ND
Di-ethyl phthalate	ND	ND	10.2	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	BM @ 11	ND	BM @ 10	ND	ND	ND	BM @ 10
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	3.16	ND	ND	ND	ND	ND
N-nitrosodiphenyl amine	ND	ND	ND	ND	ND	ND	ND	ND

[a]Non-priority organic quantified.
ND = Not detected.
BM = Below method detection limit.

302573

TABLE CC-4 (Page 7 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	S-1	S-2	S-3	S-4	S-5	S-6	DW-2	DW-4
DATE SAMPLED	9/4/85	9/5/85	8/29/85	9/4/85	8/28/85	8/28/85	9/5/85	9/5/85
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND	ND	ND
METALS, ppm								
Beryllium	ND	ND	BM @ 0.002	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	BM @ 0.003	ND	ND	ND	ND
Chromium	ND	BM @ 0.01	0.02	0.03	BM @ 0.02	ND	ND	ND
Copper	0.01	0.01	0.03	0.02	0.01	0.04	BM @ 0.009	BM @ 0.009
Lead	BM @ 0.01	0.014	0.022	0.009	0.028	0.017	0.011	ND
Mercury	ND	ND	BM @ 0.0002	ND	BM @ 0.0002	BM @ 0.0002	ND	ND
Nickel	ND	BM @ 0.01	0.02	0.03	ND	BM @ 0.009	ND	ND
Selenium	ND	ND	ND	ND	BM @ 0.005	ND	ND	ND
Silver	BM @ 0.01	ND	BM @ 0.009	BM @ 0.01	ND	ND	ND	ND
Thallium	BM @ 0.005	ND	BM @ 0.005	ND	ND	ND	BM @ 0.005	BM @ 0.005
Zinc	0.05	0.10	0.24	0.04	ND	0.04	ND	BM @ 0.04
MISCELLANEOUS, ppb								
Cyanides	ND	ND	ND	ND	ND	ND	ND	ND
Phenols	270	ND	ND	ND	ND	ND	ND	ND
TENTATIVELY IDENTIFIED VOLATILES, ppb					NF		NF	NF
Unknown(s)	254	-	69.3, 105, 11.9	-		-		
Dichlorofluoroethane	-	-	128	-		-		
Methoxyethane	-	-	-	-		-		
Carbon disulfide	-	-	20.1	-		21.2		
1,1'-Oxybisethane	-	-	138	617		-		
2,4-Dimethyl-2-pentanol	-	-	-	-		-		
Trimethyl-silanol	-	-	-	29.7		-		
2,2'-Oxybispropane	-	-	-	32.6		-		
1,3-Dichlorobenzene	-	-	-	-		-		
Dichlorobenzene	-	108	-	-		-		
2-Butanol	1270	-	10.2	-		-		
2-Hexanone	-	-	103	-		-		
1,4-Dioxane	-	-	-	29.8		-		
4-Methyl-2-pentanone	367	-	-	-		-		
2-Propanone	266	-	-	-		-		

NF = None found.
- = Not found.
ND = Not detected.
BM = Below method detection limit.

302574

TABLE CC-4 (Page 8 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	S-1	S-2	S-3	S-4	S-5	S-6	DW-2	DW-4
DATE SAMPLED	9/4/85	9/5/85	8/29/85	9/4/85	8/28/85	8/28/85	9/5/85	9/5/85
TENTATIVELY IDENTIFIED ACIDS, ppb								
Unknown(s)	188, 245, 351	37.56, 19.13, 215.9, 9.99, 280.3, 12.95	283.7, 90.95, 65.56, 67.81, 183.95, 497.48, 534.76	173, 73, 36, 140	8.36, 39	4.64, 36.5	9, 21	12.2, 16
Alcohol	-	-	-	-	-	-	-	-
2,4,6-(1H,3H,5H)-primidinetrione,5-ethyl-5-phenyl	-	-	-	-	-	-	-	-
3-Methoxy-1,1'-biphenyl	-	-	-	-	-	4.59	-	-
2-Methyl-benzenesulfonamide	-	-	-	-	-	-	-	-
Di-methylpropanoic acid	-	-	-	-	-	-		-
1,1-Dimethylethylbenzoic acid	-	-	-	-	-	-	-	-
1,1-dioxide-1,2-benzisothralzol-one	-	-	-	128	-	-		
Propanoic acid	95	-	-	-	-	-	-	-
Methylpropylester propanoic acid	-	-	-	-	-	-	-	-
Trichloromethane (chloroform)	-	22.1	-	-	-	-	-	
Benzene	-	184.4	183.75	-	-	-	-	-
Cis-2-bromocyclohexanol	-	8.94	-	-	-	-	-	-
Fluorobiphenyl	-	14.03	-	-	-	-	-	-
2-Methylhexanoic acid	-	-	280.85	-	-	-	-	-
Benzenepropanoic acid	732	-	156.84	-	-	-	-	-
Dimethylethylmethyl-benzenamide	-	-	-	59	-	-	-	-
Ethylmethyl benzene-sulfonamide	-	-	-	225	-	-	-	-
Tetrahydromethoxy-pyridoindol-one	-	-	-	40	-	-	-	-
Trihydroxyxauthenone	-	-	-	87	-	-	-	-
Methyl cyclohexane	-	-	-	-	-	-	10	7.4
2,3-Dimethyl naphthalene	-	-	-	-	-	-	-	4.7
Methyl hexanoic acid	427	-	-	-	-	-	-	-
4-Methyl phenol	116	-	-	-	-	-	-	-
Hexanoic acid	150	-	-	-	-	-	-	-
Benzoic acid	319	-	-	-	-	-	-	-

- = Not found.

302575

TABLE CC-4 (Page 9 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	S-1	S-2	S-3	S-4	S-5	S-6	DW-2	DW-4
DATE SAMPLED	9/4/85	9/5/85	8/29/85	9/4/85	8/28/85	8/28/85	9/5/85	9/5/85
TENTATIVELY IDENTIFIED BASE/NEUTRALS, ppb					NF	NF		
Unknown(s)	21.13, 20.45 15.86	5, 8, 14, 21	20.4, 8.97, 6.99, 9.7, 12.8, 16, 15.4, 8.03, 18.3, 28.9, 10.7	7, 16, 6,,5.5 6, 7, 5, 8, 12, 13			4.3, 8	5.96
Methylbenzene (toluene)	-	-	-	-			-	-
Tetrachloroethene (tetrachlor-ethylene)	-	-	-	-			-	-
3,3,5-Trimethyl cyclohexane	-	-	-	-			-	-
Dichloromethane (methylene chloride)	-	89	-	653			-	-
Dioctylesterhexanidioic acid	-	-	-	-			-	-
Dodecanoic acid	-	-	-	-			-	-
Tetraethylesterdiphosphoric acid	-	-	-	17			-	-
4-Ethoxybenzenamine	-	-	-	-			-	-
4-Chloro-2-methyl-benzenamine	-	-	-	-			-	-
N-(1,1-dimethylethyl)-3-methyl benzamide	-	-	-	20			-	-
Chlorobenzene	-	6	10.9	5			-	-
Dimethybenzene (xylene)	-	-	7.9	-			-	-
Trimethylester phosphoric acid	-	-	15.5	-			-	-
Trimethylbicycloheptanone	-	-	12.9	-			-	-
2,4,6-cycloheptatrien-1-one	-	-	-	6			-	-
2-Hexanone	36.43	-	-	-			-	-
1,2-Dimethyl benzene	19.98	-	-	-			-	-
Cyclohexanol	182.55	-	-	-			-	-
Cyclohexanone	38.71	-	-	-			-	-
3,3,5-Cyclohexanone	13.52	-	-	-			-	-
1,3,3-Trimethyl bicyclo [2.2.1] heptan-2-one	14.5	-	-	-			-	-
Alpha.,alpha.,4-trimethyl-cyclohexane methanol	118.57	-	-	-			-	-
5-methyl-2-(1-methylethyl)-(1.alpha.,2.beta.,5.alpha.) cyclohexanol	21.62	-	-	-			-	-
Hydrocarbon	15.63	-	-	-			-	-
1,1'-oxybis (2-methoxy) ethane	14.92	-	-	-			-	-
Hexahydro-2H-azepin-2-one	13.81	-	-	-			-	-
1-[2-(2-Methoxy-1-methylethoxy) -1-methylethoxyl]-2-propanol)	16.23	-	-	-			-	-

NF = None found.
- = Not found.

302576

TABLE CC-4 (Page 10 of 10)

SUMMARY OF MONITORING WELL SAMPLES

Combe Fill South Landfill

PARAMETER	S-1	S-2	S-3	S-4	S-5	S-6	DW-2	DW-4
DATE SAMPLED	9/4/85	9/5/85	8/29/85	9/4/85	8/28/85	8/28/85	9/5/85	9/5/85
CONVENTIONALS, ppm								
pH (units)	7.5	7.6	6.3	7.6	6.6	6.7	6.0	6.8
Temperature (°C)	20.2	19.2	19.7	21	14.8	14.0	13.2	14.8
Specific conductance (μmhos/cm) - field	2520	550	1950	2000	55	45	71	140
Nitrate as N			<0.1	<0.1				
TOC			190, 200	31, 32				
Specific conductance (μmhos/cm) - lab			1892, 1895	1992, 1972				
BOD			320	20				
COD			480	110				
TSS			630	62				
TDS			2200	1580				
Hardness			1030	730				
Alkalinity			510	360				
Ammonia as N			<0.05	<0.05				
TKN			3.7	3.2				
Total coliform (C/100 ml)			TNTC	4				
Fecal coliform (C/100 ml)			0	0				
RADIOACTIVITY, pCi/l								
Gross α			13 ± 12	13 ± 7.8				
Gross β			<5.1	4.8 ± 7.7				

Blank = Not run.
TNTC = Too numerous to count.

TABLE CC-5 (Page 1 of 4)

SUMMARY OF PREVIOUS MONITORING WELL SAMPLES

Combe Fill South Landfill

	MONITORING WELL NUMBER														
	DW-1 LANDFILL GARAGE			DW-2 TOP OF DRIVEWAY			DW-3 FILIBERTO SENIOR HOME			DW-4 NEAR POWERLINE ON NORTH BOUNDARY			DW-5 NEAR POWERLINE ON SOUTH BOUNDARY		
COMPOUND OR GROUP	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES
VOLATILES, ppb															
Carbon tetrachloride										338	338	1	135	135	1
1,2-Dichloroethane										12	12	1	ND	ND	1
Tetrachloroethylene										100	100	1	ND	ND	1
Trichloroethylene										46	46	1	ND	ND	1
METALS, ppm															
Arsenic	ND-0.003	0.0006	5	ND-0.004	0.0008	5	ND	ND	4	0.005	0.0001	5	ND-0.013	0.0026	5
Cadmium	ND-0.13	0.031	8	ND	ND	6	ND-0.22	0.03	8	ND	ND	7	ND-0.004	0.001	7
Chromium															
Copper	ND-0.2	0.05	4	ND	ND	3	ND-1.4	0.395	4	ND-0.014	0.0035	4	ND-0.02	0.0095	4
Lead	ND-0.12	0.055	8	ND-0.02	0.004	7	ND-0.06	0.024	7	ND-0.11	0.022	7	ND-0.05	0.012	8
Mercury	ND-0.002	0.00067	3	ND	ND	3	ND	ND	2	ND-0.002	0.001	3	ND-0.006	0.0023	4
Selenium	ND	ND	3	ND	ND	3	ND	ND	3	ND	ND	3	ND	ND	3
Silver	ND	ND	3	ND	ND	3	ND	ND	3	ND	ND	3	ND	ND	3
Zinc	0.07-3.2	0.764	5	ND-1.4	0.35	4	0.02-4.0	1.11	5	ND-1.0	0.248	5	0.03-1.5	0.627	5
MISCELLANEOUS, ppb															
Cyanides	ND-110	37.5	6	ND-120	37.6	5	ND-40	13.4	5	ND-30	10.0	5	ND-20	4	5
Phenols	ND-100	9.3	14	ND-60	5.0	12	ND-60	4.3	14	ND-20	1.67	12	ND-10	2.1	11
CONVENTIONALS, ppm															
pH (Units)	6.5-7.3	7.0	3	7.0-7.3	7.15	2	6.4-7.4	6.9	3	7.8	7.8	1	7.5	7.5	1
DO	5.9-9.8	8.6	7	8.0-9.7	8.66	5	3.8-9.4	7.2	7	3.3-6.7	5.1	6	5.7-8.9	7.2	6
BOD	0-13	4.0	14	0-42	10.1	12	0-17	3.96	14	0-29	6.6	13	0-14	5.2	12
COD	0-32	65.0	14	0-290	73.5	12	0-260	56.0	14	0-200	35.8	13	0-760	84.4	12
TDS	72.5-380	215.8	14	43-439	107.7	12	63-167	97.5	14	31-230	71.0	12	100-470	208.7	11
Hardness	56-236	101.1	14	12-132	39.4	12	17-200	69.2	14	20-152	47.4	13	32-175	208.7	11
Nitrate as N	0.22-0.8	0.305	6	0.15-0.30	0.27	5	0.04-0.9	0.41	6	0.5-1.0	0.36	5	0.1-1.0	0.55	4

Blank = Not run.
ND = Not detected.
BM = Below method detection limit.
Note: In computing averages the values used for BM are 1/2 the detection limit, and a zero value is used for NDs.

TABLE CC-5 (Page 2 of 4)

SUMMARY OF PREVIOUS MONITORING WELL SAMPLES

Combe Fill South Landfill

	MONITORING WELL NUMBER														
	DW-1 LANDFILL GARAGE			DW-2 TOP OF DRIVEWAY			DW-3 FILIBERTO SENIOR HOME			DW-4 NEAR POWERLINE ON NORTH BOUNDARY			DW-5 NEAR POWERLINE ON SOUTH BOUNDARY		
COMPOUND OR GROUP	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES
CONVENTIONALS, ppm															
Turbidity (NTU)	0.3-7.6	2.7	3	0.4-2.4	1.15	3	0.26-0.34	0.3	3	2.4-45	16.6	3	0.38-260	88.1	3
Phosphates	0-0.06	0.025	4	0-0.07	0.043	2	0-0.04	0.018	4	0-0.12	0.08	3	0-0.13	0.08	3
Total coliform (c/100 ml)	0	0	9	0	0	7	0	0	9	0-3	0.378	8	0-12	2.1	7
Fecal coliform (c/100 ml)	0	0	9	0	0	7	0	0	9	0	0	8	0	0	7
Fecal streptococcus (c/100 ml)	0-4	0.44	9	0	0	7	0-32	3.6	9	0	0	8	0-30	4.6	7
Chloride	32-162	72.7	14	3.7-160	30.2	12	3-88	15.2	14	2-82	14.0	13	5.9-108	52.5	12
Fluoride	0-0.47	0.16	3	0-0.05	0.028	3	0-0.03	0.018	3	0.02-0.11	0.053	3	0-0.01	0.003	3
Sulfate	0-10	5	5	1-4.3	2.6	4	3-15	7.3	5	0-5.6	1.65	4	0-19	6.25	4
Ammonia N	0-0.3	0.1	3	0	0	3	0	0	3	0	0	3	0	0	2
Suspended solids										13	13	1	304	304	1
OTHER METALS, ppm															
Chromium^{+6}	ND-0.04	0.012	5	0-0.05	0.02	4	0-0.05	0.012	5	0-0.02	0.0058	6	0-0.093	0.033	5
Barium	ND-0.28	0.17	3	0-0.20	0.13	3	0-0.62	0.347	3	0-0.22	0.14	3	0-0.26	0.167	3
Iron	ND-11.5	1.40	14	0-8.5	0.85	12	0-0.94	0.232	14	0-8.215	2.43	13	0-58	7.28	12
Manganese	ND-0.1	0.042	5	0-0.05	0.013	4	0-0.2	0.068	5	0-0.05	0.013	4	0-0.12	0.045	4
Sodium	8-16	10.9	3	4.5-6	5.1	3	6.5-95	7.67	3	2.5-5.0	3.8	3	5-16	9.8	3
Aluminum										0.274	0.274	1	18.29	18.29	1
OTHER ORGANICS, ppb															
Ether soluble	ND-400	230	3	ND-500	330	3	0-500	300	3	0-250	150	3	0-150	83	3

ND = Not detected.
Blank = Not run.
Note: In computing averages the values used for BM are 1/2 the detection limit, and a zero value is used for NDs.

302579

TABLE CC-5 (Page 3 of 4)

SUMMARY OF PREVIOUS MONITORING WELL SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	MONITORING WELL NUMBER SW-4 RANGE	SW-4 AVERAGE	SW-4 No. OF ANALYSES	SW-2 RANGE	SW-2 AVERAGE	SW-2 No. OF ANALYSES
VOLATILES, ppb						
Chlorobenzene	ND	ND	1	BM	1	1
1,1-Dichloroethane	11	11	1	8	8	1
1,2-Dichloroethane	22	22	1	14	14	1
Ethylbenzene	ND	ND	1	10	10	1
Tetrachloroethylene	6	6	1	ND	ND	1
Toluene	4	4	1	13	13	1
Trans-1,2-dichloroethylene	ND	ND	1	35	35	1
ACID/PHENOLICS, ppb	ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb	ND	ND	1	ND	ND	1
PESTICIDES/PCBs, ppb	ND	ND	1	ND	ND	1
METALS, ppm						
Arsenic	ND	ND	1	0.02	0.02	1
Cadmium	ND	ND	1	0.01	0.01	1
Chromium	ND	ND	1	0.02	0.02	1
Lead	0.02	0.02	1	ND	ND	1
Mercury	ND	ND	1	ND	ND	1
MISCELLANEOUS, ppb						
Cyanides	ND	ND	1	ND	ND	1
Phenols	ND	ND	1	160	160	1

ND = Not detected.
BM = Below method detection limit.
Note: In computing averages the values used for BM are 1/2 the detection limit, and a zero value is used for NDs.

302580

TABLE CC-5 (Page 4 of 4)

SUMMARY OF PREVIOUS MONITORING WELL SAMPLES

Combe Fill South Landfill

	MONITORING WELL NUMBER					
	SW-4			SW-2		
COMPOUND OR GROUP	RANGE	AVERAGE	No. OF ANALYSES	RANGE	AVERAGE	No. OF ANALYSES
CONVENTIONALS, ppm						
BOD	0	0	1	5.7	5.7	1
COD	55	55	1	65	65	1
TDS	96	96	1	472	472	1
Hardness	28	28	1	279	279	1
Total coliform (c/100 ml)	22	22	1	0	0	1
Fecal coliform (c/100 ml)	60	60	1	0	0	1
Fecal streptococcus (c/100 ml)	0	0	1	0	0	1
Chloride	8.7	8.7	1	99	99	1
TKN	0	0	1	1.4	1.4	1
Nitrate	0.77	0.77	1	0	0	1
Nitrite	0	0	1	0.015	0.015	1
OTHER METAL, ppm						
Manganese	0.02	0.02	1	9.4	9.4	1

Note: *In computing averages the values used for BM are 1/2 the detection limit, and a zero value is used for NDs.*

EPA REGION II
SCANNING TRACKING SHEET

DOC ID # 39887

DOC TITLE/SUBJECT:

PRELIMINARY REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) - VOLUME II - APPENDICES (CONFIDENTIAL)
Pages 302582-302607

THIS PORTION OF THE DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND CAN BE LOCATED IN THE

SUPERFUND RECORDS CENTER
290 BROADWAY, 18TH FLOOR
NEW YORK, NY 10007

TABLE CC-16 (Page 1 of 5)

SUMMARY OF LEACHATE SEEP SAMPLES

Combe Fill South Landfill

PARAMETER	L-1	L-2	L-3	L-3	L-6	L-7	L-7	L-8	L-8
DATE SAMPLED	8/13/85	10/17/85	8/13/85	10/17/85	10/17/85	8/13/85	10/17/85	8/13/85	10/17/85
FLOW, L/min.		0.2		0.07	0.03		0.1		0.2
VOLATILES, ppb									
Acrolein	ND	ND	ND	BM @ 100	ND	ND	BM @ 100	ND	ND
Benzene	14.7	ND	36.2	28.1	10.1	48.8	34.2	77.3	60.7
Chlorobenzene	36.4	ND	25.3	30.1	29.4	ND	6.56	7.09	8.11
Chloroethane	ND	ND	12.0	15.3	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	BM @ 2.8	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	11.9	ND	42.7	56.0	60.8	75.3	53.9	49.6	46.0
Methylene chloride	2.8	14.2	ND	12.8	BM @ 2.8	136	12.6	ND	13.2
Toluene	BM @ 6.0	BM @ 6.0	ND	15.1	BM @ 6	1510	245	8.41	8.10
1,1,1-Trichloroethane	BM @ 3.8	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane[a]	ND	ND	ND	BM @ 10	ND	ND	ND	ND	10.7
Vinyl chloride	ND	ND	ND	BM @ 10	ND	ND	ND	ND	ND
ACID/PHENOLICS, ppb									
2,4-Dichlorophenol	ND	BM @ 2.7		ND	ND		ND		ND
2,4-Dimethylphenol	ND	ND		ND	7.09		ND		ND
Phenol	2.92	ND		ND	ND		ND		ND
BASE/NEUTRALS, ppb									
Acenaphthene	BM @ 2	ND		ND	ND		ND		ND
Bis (2-ethylhexyl) phthalate	ND	BM @ 10		12.5	BM @ 11		ND		BM @ 11
Butyl Benzylphthalate	ND	46		BM @ 10	29.4		ND		60.0
1,4-Dichlorobenzene	ND	ND		19.1	11.7		BM @ 4.6		6.73
Diethyl phthalate	BM @ 11	BM @ 10		BM @ 10	ND		ND		ND
Di-n-butyl phthalate	ND	ND		BM @ 10	ND		ND		ND
Naphthalene	17.7	ND		11.2	8.86		ND		21.1
PESTICIDES/PCBs, ppb	ND	ND		ND	ND		ND		ND
METALS, ppm									
Arsenic	ND	ND		ND	ND		ND		BM @ 0.01
Cadmium	ND	ND		ND	ND		0.02		ND
Chromium	ND	ND		BM @ 0.01	BM @ 0.01		0.03		BM @ 0.01
Copper	BM @ 0.01	ND		BM @ 0.01	0.01		0.04		BM @ 0.01

[a]Non-priority organic quantified.
Blank = Not run.
ND = Not detected.
BM = Below method detection limit.

302608

TABLE CC-16 (Page 2 of 5)

SUMMARY OF LEACHATE SEEP SAMPLES

Combe Fill South Landfill

PARAMETER	L-1	L-2	L-3	L-3	L-6	L-7	L-7	L-8	L-8
DATE SAMPLED	8/13/85	10/17/85	8/13/85	10/17/85	10/17/85	8/13/85	10/17/85	8/13/85	10/17/85
METALS, ppm (Continued)									
Lead	0.009	ND		BM @ 0.05	ND		0.3		BM @ 0.05
Mercury	ND	ND		ND	ND		0.0004		0.0004
Nickel	ND	ND		0.03	0.04		0.19		0.04
Selenium	ND	BM @ 0.05		ND	ND		ND		ND
Zinc	0.050	BM @ 0.09		BM @ 0.09	0.1		2.6		0.6
MISCELLANEOUS, ppb									
Cyanides	ND	47.2		31.1	38.3		28.1		ND
Phenols	100	ND		257	247		418		254
TENTATIVELY IDENTIFIED VOLATILES, ppb		NF							
Unknown(s)	23.6, 3847, 48.6		-	69,30	25.4, 11.8, 23.3, 57.6, 15.6, 110	9839.0, 32.0, 53.3	43	52.3	49, 49
1,2-Dimethylbenzene (O-Xylene)	251		309	-	246	-	111	66.5	-
1,3-Dimethylbenzene (M-Xylene)	71.7		112	178	364	-	-	-	-
Carbon dioxide	-		8874	-	-	-	-	3803.8	-
Tetrahydrofurane	-		115	-	-	-	-	51.8	-
1,1'-Oxybisethane	-		46.1	-	-	-	-	165	-
1,3,3-Trimethyl-bicyclo [2.2.1] heptan-2-one	-		86.4	-	-	-	-	-	-
1,3,3-Trimethyl-2-oxabicyclo [2.2.2] octane	-		-	-	-	-	-	35.4	-
Dimethylbenzene (Xylene)	-		-	-	-	-	-	-	245
3-Methoxy-1-propene	-		-	-	20.1	-	-	-	-
Trimethyl-hydrazine	-		-	-	13.1	-	39	-	-
(1S,3S,6R)-(-)-4-Carene	-		-	-	-	-	120	-	-
TENTATIVELY IDENTIFIED ACIDS, ppb									
Unknown(s)	5,33,8,20, 4,7,4,32, 41	26,9,20		79.54, 131.4, 33.91, 29.85, 56.84, 49.33, 30.44, 25.27, 904.17, 84.51, 64.51, 25.56	76, 62, 75, 286, 164, 85, 87, 71, 45, 71, 58, 47		30, 49, 55, 19, 35, 35, 49, 31, 68		155, 298, 61.4 32.1, 95.8, 42.0 25.9, 26.2, 53.2 25.1, 248

Blank = Not run.
\- = Not found.
NF = None found.
BM = Below method detection limit.

302609

TABLE CC-16 (Page 3 of 5)

SUMMARY OF LEACHATE SEEP SAMPLES

Combe Fill South Landfill

PARAMETER	L-1	L-2	L-3	L-3	L-6	L-7	L-7	L-8	L-8
DATE SAMPLED	8/13/85	10/17/85	8/13/85	10/17/85	10/17/85	8/13/85	10/17/85	8/13/85	10/17/85
TENTATIVELY IDENTIFIED ACIDS, ppb (continued)									
Dimethyl benzoic acid	33	-		-	-		-		-
1,4-Dimethyl-naphthalene	24	-		-	-		-		-
Decahydro-2,3-dimethyl-naphthalene	-	-		23.59	-		-		-
2-(2-Butoxy-ethoxyl)-ethanol	-	-		41.55	-		-		-
1,5-Dibromopentane	-	-		-	-		-		49.7
Diethylester phosphoric acid	-	-		52.86	-		-		30.8
Cyclohexane	-	-		-	-		-		47.4
N-(1,1-dimethyl-ethyl) benzamide	-	-		-	-		-		56.9
1,3,3-Trimethyl bicyclo [2,2,1]-heptan-2-one	-	-		-	56		-		-
Alkane(s)	-	-		-	63, 38		13, 12, 15, 22		-
2,2-Dimethylbenzene methanol	-	-		-	-		42		-
1 -[2(2-Methoxy-1-meth-oxy)-1-methylethoxyl-2-propanol	-	-		-	-		30		-
1-Chloro-2-nitrobenzene	-	17		-	-		-		-
4-Hydrophenyl esterthio cyanic acid	-	19		-	-		-		-
Alkene	-	12		-	-		-		-
TENTATIVELY IDENTIFIED BASE/NEUTRALS, ppb									
Unknown(s)	14,22,15	12, 62, 9, 20, 16		39, 460, 94, 41, 40, 100, 68, 180, 45, 2000	38.6, 203, 188, 75.8, 59.7, 69.5, 38.2, 89.5, 33.7, 32.3		154, 120, 55, 82 57, 51, 94, 78, 67, 512		100, 220, 25, 45, 23, 22, 250, 14
2,2,4-Trimethyl-1,3-dioxolane	19	-		-	-		-		-
Methylbenzene (Toluene)	22	-		-	-		-		-
3-Methylene-2-penta-none	90	-		-	-		-		-
Tetrachloroethene (Tetrachloroethylene)	91	-		-	-		-		-
1,3-Dimethylbenzene (M-Xylene)	53	-		-	33.6		-		-

Blank = Not run.
- = Not found.

302610

TABLE CC-16 (Page 4 of 5)

SUMMARY OF LEACHATE SEEP SAMPLES

Combe Fill South Landfill

PARAMETER	L-1	L-2	L-3	L-3	L-6	L-7	L-7	L-8	L-8
DATE SAMPLED	8/13/85	10/17/85	8/13/85	10/17/85	10/17/85	8/13/85	10/17/85	8/13/85	10/17/85
TENTATIVELY IDENTIFIED BASE/NEUTRALS, ppb (continued)									
1,2,4-Trimethyl-benzene	19	-		-	-		-		-
1,3,3-Trimethylbicyclo-[2.2.1] heptane-2-one	18	-		140	54.1		-		-
1,7,7-Trimethylbicyclo-[2.2.1] heptane-2-one	70	-		-	-		-		-
2-(2-Butoxyethoxy) ethanol	538	-		-	-		-		-
1-Methylnaphthalene	35	-		-	-		-		-
2-Methylnaphthalene	29	-		-	-		-		-
1,7-Dimethylnaphthalene	12	-		-	-		-		-
1,2,3-Trimethylbenzene	-	-		84	-		-		27
Tetramethylester disphosphoric acid	-	-		-	-		-		14
1-[2-(2-Methoxy-ethoxy)-1-methyl-ethoxyl-2-propanol	-	-		-	-		-		21
N-(1,1-dimethylethyl)-3-methyl-benzamide	-	-		-	-		-		36
Phlhalazin-1-one	-	-		-	-		-		14
2(3H)-benzothiazolone	-	13		140	88.2		-		35
2,2,4-Trimethyl-1,3-pentanediol	-	-		-	71.2		72		-
2,3-Dihydro-6-methyl-4H-1-benzopyron-4-one	-	-		-	40.1		-		-
Cyclohexene	-	-		62	-		-		-
1,4-Dioxane	-	-		54	-		-		-
1-Methyl-3-(1-methyl-ethyl) benzene	-	-		-	-		61		-
Tetraethylester di-phosphoric acid	-	-		-	-		110		-
X,X,4-Trimethyl cyclo-hexene methonol	-	-		-	-		553		-
1-[2-(2-Methoxy-1-methyl-ethoxy-1-methylethyoxy]-2 propanol	-	-		-	-		63		-
2-(2-methoxypropoxy)-1-propanol	-	-		-	-		141		-
2,6-Bis(1,1-dimethylethyl)-4-methylphenol	-	9		-	-		-		-

Blank = Not run.

- = Not found.

302611

TABLE CC-16 (Page 5 of 5)

SUMMARY OF LEACHATE SEEP SAMPLES

Combe Fill South Landfill

PARAMETER	L-1	L-2	L-3	L-3	L-6	L-7	L-7	L-8	L-8
DATE SAMPLED	8/13/85	10/17/85	8/13/85	10/17/85	10/17/85	8/13/85	10/17/85	8/13/85	10/17/85
CONVENTIONALS, ppm									
pH (Units)	6.3	6.6		7.0	7.1		7.1		6.95
Temp. (°C)	19.4	20.0		18.0	17.0		17.0		19.0
Spec. Cond. (μmhos/cm)- field	2700	800		4420	4800		9000		4900
Salinity (ppt)	1.5	0.2		3.0	3.1		6.1		3.1
TOC		90, 87		310, 280			1600, 1600		470, 460
Spec. cond (μmhos/cm) lab		780, 780		5656, 5787			11000, 11000		5500, 5700
Alkalinity		300		2400			4700		2800
Hardness		180		800			1020		900
BOD		9		70			360		76
COD		48		530			2300		630
Nitrate as N		1.3		<0.1			<0.1		<0.1
Ammonia as N		25		240			670		260
TKN		25		300			880		270
TDS		498		2990			7640		3520
TSS		14		140			1700		450
Total Coliform (C/100 ml)		3500		900			14000		10000
Fecal Coliform (C/100 ml)		0		0			0		0
RADIOACTIVITY, pCi/l									
Gross α		<1.0		30 ± 17					
Gross β		21 ± 2.7		243 ± 24					

Blank = Not run.

302612

TABLE CC-17 (Page 1 of 3)

SUMMARY OF SEDIMENT DATA FOR LEACHATE

Combe Fill South Landfill

PARAMETERS	STATION LS-1	LS-2	LS-3	LS-4	LS-5	LS-6	LS-7	LS-8
DATE SAMPLED	8/13/85	8/13/83	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
VOLATILES, ppb								
Acetone[a]	64	ND	63	34	25	55	ND	43
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	9
Methylene chloride	4[b,c]	7[b,c]	5[b,c]	5[b,c]	4[b,c]	5[b,c]	ND	3[b,c]
Tetrachloroethylene	ND	ND	ND	ND	ND	ND	ND	5[c]
Toluene	ND	ND	ND	ND	ND	ND	ND	9
Total xylenes[a]	ND	ND	ND	ND	ND	ND	ND	24
ACID/PHENOLICS, ppb	ND	ND	ND	ND	ND	ND	ND	ND
BASE/NEUTRALS, ppb								
Bis (2-ethylhexyl) phthalate	220[c]	330[c]	1000	170	250	480	1900	6600
Butylbenzene phthalate	ND	ND	ND	ND	ND	ND	68000	ND
Di-n-butyl phthalate	44[c]	81[c]	83	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	210	ND	ND	ND	ND	ND
Fluoranthene	ND	81[c]	41	ND	ND	ND	ND	ND
2-Methylnaphthalene[a]	180[c]	ND	41	ND	ND	ND	ND	ND
Naphthalene	44[c]	ND	41	84	ND	ND	ND	ND
Phenanthrene	44[c]	ND	83	ND	ND	ND	ND	ND
Pyrene	ND	ND	41	ND	ND	ND	ND	ND
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND	ND	ND
METALS, ppm								
Arsenic	25	21	27	42	48	41	39	35
Beryllium	1.3	1.8	1.6	2.0	1.6	1.7	1.6	1.3
Cadmium	2.8	8.8	3.1	5.8	4.0	13	7.0	5.9
Chromium	21	15	12	22	33	15	46	24
Copper	15	21	17	35	14	15	22	29
Lead	6.3	25	5.7	3.5	3.8	6.1	7.6	69
Nickel	7.4	ND	ND	9.5	6.5	3.6	22	9.4
Zinc	45[d]	213[d]	51[d]	202[d]	154[d]	58[d]	105[d]	366[d]

[a]Non-priority organic quantified.
[b]Found in method blank.
[c]Estimated value. Value is below method detection limit.
[d]Value is estimated because of interferences.
ND = Not detected.

302613

TABLE CC-17 (Page 2 of 3)

SUMMARY OF SEDIMENT DATA FOR LEACHATE

Combe Fill South Landfill

PARAMETERS	STATION LS-1	LS-2	LS-3	LS-4	LS-5	LS-6	LS-7	LS-8
DATE SAMPLED	8/13/85	8/13/83	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
MISCELLANEOUS, ppb								
Cyanides	ND	ND	ND	ND	ND	ND	ND	ND
Phenols	ND	ND	ND	ND	ND	ND	ND	ND
TENTATIVELY IDENTIFIED VOLATILES, ppb		NF		NF	NF		NF	
Unknown(s)	-		380			-		270,10
Trimethyl silanol	10		25			9		-
Tetrahydrofuran	-		17			-		-
TENTATIVELY IDENTIFIED ACIDS/BASE/NEUTRALS, ppb								
Unknown(s)	5816, 459,311,326, 456,640,480, 1440,1600, 1173	6145, 1122, 17206, 1745, 720, 4022	305, 458, 5498, 7102, 535,11607, 382,806, 2843,1034	8330, 730, 3870, 660	1765, 7294, 18118, 710,387, 645,310, 609	518, 8593, 6108, 2899, 15944, 311,414, 828	3178, 1222, 15278, 856, 5749,1291, 939,939, 3385,17600, 16070,12626, 2678,6431, 5754,4591	3864, 1600, 10400, 12712, 3032, 13389
4-Hydroxy-4-methyl-2-pentanone	7270	10837	4123	7670	9294	-	11367	13200
2-Fluorophenol	4362	-	-	-	-	-	-	-
1-Methylethenyl-benzene	306	-	305	-	-	-	-	-
Sulfur, mol. (58)	560	-	-	-	-	-	-	-
3-Methyl octane	-	-	-	-	1882	-	-	-
2-Methyl-1-pentene	-	-	-	-	-	-	1344	-

ND = Not detected.
\- = Not found.
NF = None found.

302614

TABLE CC-17 (Page 3 of 3)

SUMMARY OF SEDIMENT DATA FOR LEACHATE

Combe Fill South Landfill

PARAMETERS	STATION							
	LS-1	LS-2	LS-3	LS-4	LS-5	LS-6	LS-7	LS-8
DATE SAMPLED	8/13/85	8/13/83	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
NON-PRIORITY METALS, ppm								
Aluminum	21200	16800	19400	37500	23000	38600	24200	22600
Barium	127	137	130	91	151	133	62	145
Calcium	195	ND	ND	ND	ND	ND	ND	13600
Cobalt	6.6	9.5	8.7	14	12	9.4	11	11
Iron	36100	126800	38900	45700	80600	38900	35700	51400
Magnesium	1750[a]	2810[a]	2480[a]	2700[a]	2370[a]	2450[a]	2470[a]	3540[a]
Manganese	248	217	272	386	556	369	282	660
Potassium	1640	1950	1840	2660	2400	2600	2820	3350
Sodium	385	450	602	354	617	983	776	1130
Tin	22	45	25	22	23	18	15	17
Vanadium	40[a]	26[a]	37[a]	72[a]	35[a]	47[a]	49[a]	38[a]
CONVENTIONALS								
pH (Units)	8.0	6.8	8.2	7.27	7.26	8.21	8.31	7.78
Solids (%)	75	75	75	79	65	74	79	59

[a]Value is estimated because of interferences.
ND = Not detected.

302615

TABLE CC-18 (Page 1 of 2)

SUMMARY OF PREVIOUS LEACHATE SEEP SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	LEACHATE SEEP FLOWING INTO W. BR. TROUT BK. (I)[a] RANGE	AVERAGE	# OF ANALYSES	LEACHATE COLLECTION SUMP NR. POWERLINE (X) RANGE	AVERAGE	# OF ANALYSES	LEACHATE POND WEST OF FILL AREA (Y) RANGE	AVERAGE	# OF ANALYSES
VOLATILES, ppb									
Benzene	ND	ND	1	33	33	1	46	46	1
Chlorobenzene	ND	ND	1	BM	5	1	52	52	1
Chloroethane	ND	ND	1	ND	ND	1	11	11	1
Chloroform	ND	ND	1	BM	5	1	ND	ND	1
Dichlorodifluoromethane[b]	ND	ND	1	549	549	1	18	18	1
1,1-Dichloroethane	160	160	1	56	56	1	BM	5	1
1,2-Dichloropropane	ND	ND	1	BM	5	1	ND	ND	1
Ethylbenzene	ND	ND	1	ND	ND	1	265	265	1
Methylene chloride	280	280	1	BM	5	1	BM	5	1
Tetrachloroethylene	BM	1	1	23	23	1	BM	5	1
Toluene	9	9	1	75	75	1	313	313	1
Trans-1,2-dichloroethylene	ND	ND	1	26	26	1	BM	5	1
1,1,1-Trichloroethane	ND	ND	1	BM	5	1	BM	5	1
Trichloroethylene				16	16	1	BM	5	1
Trichlorofluoromethane[b]	ND	ND	1	143	143	1	26	26	1
Vinyl chloride				BM	5	1	15	15	1
ACID/PHENOLICS, ppb	ND	ND	1	ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb									
1,2-Dichlorobenzene	ND	ND	1	25	25	1	ND	ND	1
1,4-Dichlorobenzene	ND	ND	1	BM	5	1	14	14	1
Diethyl phthalate	54	54	1	ND	ND	1	ND	ND	1
Di-n-butyl phthalate	ND	ND	1	ND	ND	1	BM	5	1
Naphthalene	BM	5	1	ND	ND	1	ND	ND	1
PESTICIDES/PCBs, ppb									
α-Endosulfan	BM	0.5	1	ND	ND	1	ND	ND	1
METALS, ppm									
Antimony				ND	ND	1	BM	0.03	1
Arsenic	BM	0.005	1	BM	0.0025	1	0.009	0.009	1
Beryllium				0.011	0.011	1	0.026	0.026	1
Cadmium	BM	0.005	1	0.008	0.008	1	BM	0.0025	1
Chromium	BM	0.005	1	0.017	0.017	1	0.13	0.13	1
Copper				0.065	0.065	1	0.14	0.14	1
Lead	0.02	0.02	1	0.24	0.24	1	0.33	0.33	1
Mercury	BM	0.001	1	0.0007	0.0007	1	0.0004	0.0004	1
Nickel				0.031	0.031	1	0.044	0.044	1
Selenium				ND	ND	1	0.008	0.008	1
Thallium				BM	0.0025	1	0.012	0.012	1
Zinc				1.4	1.4	1	2.3	2.3	1

[a]Letter refers to location of station on Figure 5-2.
[b]Non-priority organic quantified.
ND - Not detected.
BM - Below method detection limit.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

TABLE CC-18 (Page 2 of 2)

SUMMARY OF PREVIOUS LEACHATE SEEP SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	LEACHATE SEEP FLOWING INTO W. BR. TROUT BK. (I)[a]			LEACHATE COLLECTION SUMP NR. POWERLINE (X)			LEACHATE POND WEST OF FILL AREA (Y)		
	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
MISCELLANEOUS, ppb									
Cyanides	ND	ND	1	ND	ND	1	ND	ND	1
Phenols	ND	ND	1	ND	ND	1	130	130	1
CONVENTIONALS, ppm									
BOD	0	0	1						
COD	17	17	1						
TDS	107	107	1						
Hardness	45	45	1						
TOC	12	12	1						
Total Coliform (c/100ml)	14	14	1						
Fecal Coliform (c/100ml)	46	46	1						
Fecal Streptococcus (c/100ml)	0	0	1						
Chloride	13.6	13.6	1						
TKN	4.2	4.2	1						
Nitrate as N	ND	ND	1						
OTHER METALS, ppm									
Manganese	0.27	0.27	1						
OTHER ORGANICS, ppb									
1,4-Dichlorobutane	ND	ND	1						
Heptane	ND	ND	1						
Nonane	ND	ND	1						
m, p-Xylene	ND	ND	1						
o-Xylene	ND	ND	1						
	ND	ND	1						
RADIOACTIVITY, pCi/l									
Gross α	1.18	1.18	1						
Gross β	2.56	2.56	1						

[a]Letter refers to location of station on Figure 5-2.
ND - Not detected.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

TABLE CC-19 (Page 1 of 3)

SUMMARY OF SURFACE WATER SAMPLES

Combe Fill South Landfill

PARAMETER	W-1 WEST BRANCH TROUT BROOK AT PARKER ROAD	W-2 EAST BRANCH TROUT BROOK AT PARKER ROAD	W-3 UNNAMED TRIBUTARY AT WASHINGTON TURNPIKE	W-4 TANNERS BROOK NEAR VALLEY BROOK ROAD	W-5 TANNERS BROOK AT WASHINGTON TURNPIKE	W-6 TROUT BROOK AT STATE PARK ROAD	W-7 BLACK RIVER AT ROUTE 206	W-8 BLACK RIVER 120 YDS BELOW CONFLUENCE WITH TROUT BK
DATE SAMPLED	8/13/85	10/17/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
FLOW, cfs	0.25			0.31	0.91	2.10	7.72	11.97
VOLATILES, ppb								
Methylene chloride	BM @ 2.8	ND	BM @ 2.8	ND	BM @ 2.8	3.39	3.06	BM @ 2.8
Tetrachloroethylene	ND	ND	ND	ND	ND	ND	BM @ 4.1	ND
Toluene	BM @ 6.0	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane[a]	ND	ND	ND	ND	ND	BM @ 10.0	ND	ND
ACID/PHENOLICS, ppb								
Phenol	ND	ND	ND	3.64	ND	9.05	2.20	ND
BASE/NEUTRALS, ppb								
Bis(2-ethylhexyl) phthalate	ND	BM @ 10	ND	ND	ND	ND	ND	ND
Diethyl phthalate	BM @ 10	ND	ND	BM @ 10	ND	ND	ND	ND
Di-n-butyl phthalate	ND	BM @ 10	ND	BM @ 10	ND	BM @ 10	ND	BM @ 10
Isophorone	BM @ 2.2	ND	ND	ND	ND	ND	ND	ND
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND	ND	ND
METALS, ppm								
Beryllium	ND	ND	ND	0.002	ND	ND	ND	ND
Copper	ND	ND	ND	ND	BM @ 0.01	ND	ND	ND
Lead	ND	ND	ND	BM @ 0.005	BM @ 0.005	ND	BM @ 0.005	BM @ 0.005
Selenium	ND	ND	BM @ 0.005	ND	ND	ND	ND	ND
Thallium	ND	BM @ 0.05	ND	ND	ND	ND	ND	ND
Zinc	0.02	ND	BM @ 0.02	0.03	0.04	0.05	BM @ 0.02	BM @ 0.02
MISCELLANEOUS, ppb								
Cyanides	ND	ND	ND	ND	ND	ND	ND	ND
Phenols	ND	108	ND	ND	ND	ND	ND	ND

[a]Non-priority organic quantified.
Blank = Not run.
ND = Not detected.
BM = Below method detection limit.

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TABLE CC-19 (Page 2 of 3)

SUMMARY OF SURFACE WATER SAMPLES

Combe Fill South Landfill

PARAMETER	W-1 WEST BRANCH TROUT BROOK AT PARKER ROAD	W-2 EAST BRANCH TROUT BROOK AT PARKER ROAD	W-3 UNNAMED TRIBUTARY AT WASHINGTON TURNPIKE	W-4 TANNERS BROOK NEAR VALLEY BROOK ROAD	W-5 TANNERS BROOK AT WASHINGTON TURNPIKE	W-6 TROUT BROOK AT STATE PARK ROAD	W-7 BLACK RIVER AT ROUTE 206	W-8 BLACK RIVER 120 YDS BELOW CONFLUENCE WITH TROUT BK
DATE SAMPLED	8/13/85	10/17/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
TENTATIVELY IDENTIFIED VOLATILES, ppb	NF				NF	NF	NF	NF
Unknown		133	2084	-				
3,4,4-Trimethyl-2-pentene		-	-	29				
TENTATIVELY IDENTIFIED ACIDS, ppb								
Unknown(s)	29,19,31,25	6.3, 6.6, 38,41,5.3 5.3, 77	3	5,35,16	10,29,4	7,85,51,5,4,9	42,14,5	11
3,3,3-Trichloro-1-propene	-	6.6	-	4	4	-	-	-
Benzenemethanol	-	-	-	18	-	58	15	-
1-Chloro-2-propanol	-	-	-	-	74	-	-	-
Alkane(s)	-	6.2, 19	-	-	-	-	-	-
Alkene	-	21	-	-	-	-	-	-
Alcohol	-	12	-	-	-	-	-	-
Fluoro-1,1'-biphenyl	-	36	-	-	-	-	-	-
2-Methyl-1(1)-dimethyl-2-methyl-1,3-propanediylester propanoic acid	-	5.3	-	-	-	-	-	-
Bis(2-Methylethy) ester-1,2-benzene-dicadoxylic acid	-	14	-	-	-	-	-	-
TENTATIVELY IDENTIFIED BASE/NEUTRALS, ppb		NF						
Unknown(s)	10,10,4,8,11		11	22,5,10,13,5	28,6,6,6	13	24,6,7,8,5	3.5,6.5
1,4-Dioxane	11		-	-	-	-	-	-
2,2,4-Trimethyl-1,3-dioxolane	21		-	23	22	-	48	-
4-Methyl-2-pentene	5		-	-	-	-	7	-
Methylbenzene (Toluene)	18		-	33	25	-	32	-
4-Methyl-3-penten-2-one	53		-	50	80	-	46	-
Tetrachloroethene (Tetrachloroethylene)	24		-	140	71	-	82	-
3,3,3-Trichloro-1-propene	9		-	12	12	-	11	-

Blank = Not run.
- = Not found.
NF = None found.

302619

TABLE CC-19 (Page 3 of 3)

SUMMARY OF SURFACE WATER SAMPLES

Combe Fill South Landfill

PARAMETER	W-1 WEST BRANCH TROUT BROOK AT PARKER ROAD	W-2 EAST BRANCH TROUT BROOK AT PARKER ROAD	W-3 UNNAMED TRIBUTARY AT WASHINGTON TURNPIKE	W-4 TANNERS BROOK NEAR VALLEY BROOK ROAD	W-5 TANNERS BROOK AT WASHINGTON TURNPIKE	W-6 TROUT BROOK AT STATE PARK ROAD	W-7 BLACK RIVER AT ROUTE 206	W-8 BLACK RIVER 120 YDS BELOW CONFLUENCE WITH TROUT BK
DATE SAMPLED	8/13/85	10/17/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
TENTATIVELY IDENTIFIED BASE/ NEUTRALS, ppb (Continued)		NF						
Trichloroethene (Trichloroethylene)	-		-	7	8	-	20	-
3-Penten-2-one	-		-	9	-	-	-	-
2-Butoxyethanol	-		-	11	-	-	-	-
Benzene	-		-	-	-	31.8	-	-
RADIOACTIVITY, pCi/l								
Gross α		<1.0					<0.8	
Gross β		6.4 ± 1.7					<0.8	
CONVENTIONALS								
pH (Units)	7.2	7.1	7.2	7.5	7.4	7.6	6.9	8.0
Temp. (°C)	19.6	12.2	17.7	22.3	19.0	20.1	18.1	27.5
Spec. Cond. (μmhos/cm)	410	270	94	111	100	203	278	263
Salinity (ppt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Blank = Not run.
- = Not found.
NF = None found.

302620

TABLE CC-20 (Page 1 of 2)

SUMMARY OF SURFACE WATER SEDIMENT SAMPLES

Combe Fill South Landfill

PARAMETER	WS-1 WEST BRANCH TROUT BROOK AT PARKER ROAD	WS-3 UNNAMED TRIBUTARY AT WASHINGTON TURNPIKE	WS-4 TANNERS BROOK AT VALLEY BROOK ROAD	WS-5 TANNERS BROOK AT WASHINGTON TURNPIKE	WS-6 TROUT BROOK AT STATE PARK ROAD	WS-7 BLACK RIVER AT ROUTE 206 CROSSING	WS-8 BLACK RIVER 120 YDS BELOW CONF. WITH TROUT BROOK
DATE SAMPLED	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
VOLATILES, ppb							
Methylene chloride	3[b,c]	ND	2[b,c]	3[b,c]	ND	6[b,c]	ND
Acetone[a]	ND	19[b]	ND	ND	ND	ND	ND
ACID/PHENOLICS, ppb	ND	ND	ND	ND	ND	ND	ND
BASE/NEUTRALS, ppb							
Benzo(A) pyrene	ND	ND	ND	950	ND	ND	ND
Benzo(B) fluoranthene	ND	ND	ND	670	ND	ND	ND
Benzo (G,H,I) perylene	ND	ND	ND	360	ND	ND	ND
Bis (2-ethylhexyl) phthalate	ND	390	ND	79	170	ND	ND
Chrysene	ND	ND	ND	990	ND	ND	ND
Fluoranthene	ND	530	ND	1200	ND	ND	280
Indeno (1,2,3-CD) pyrene	ND	ND	ND	400	ND	ND	ND
Phenanthrene	ND	ND	ND	990	ND	ND	160
Pyrene	ND	430	ND	790	ND	ND	240
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND	ND
METALS, ppm							
Arsenic	5.7	14	6.0	9.7	13	13	26
Beryllium	0.6	0.9	ND	ND	0.9	1.0	0.6
Cadmium	2.0	2.3	2.6	1.8	2.4	13	7.5
Chromium	4.2	164	2.1	4.3	27	90	11
Copper	ND	16	3.5	9.1	18	29	23
Lead	2.2	2.0	22	48	20	13	19
Nickel	ND	80	ND	ND	7.6	44	5.5
Zinc	29[d]	50[d]	20[d]	151[d]	32[d]	139[d]	91[d]
MISCELLANEOUS, ppb							
Cyanides	ND	ND	ND	ND	ND	ND	ND
Phenols	ND	ND	ND	ND	ND	ND	ND

[a]Non-priority pollutant quantified.
[b]Found in method blank.
[c]Estimated value. Value is below method detection limit.
[d]Value is estimated because of interferences.
ND = Not detected.

TABLE CC-20 (Page 2 of 2)

SUMMARY OF SURFACE WATER SEDIMENT SAMPLES

Combe Fill South Landfill

PARAMETER	WS-1 WEST BRANCH TROUT BROOK AT PARKER ROAD	WS-3 UNNAMED TRIBUTARY AT WASHINGTON TURNPIKE	WS-4 TANNERS BROOK AT VALLEY BROOK ROAD	WS-5 TANNERS BROOK AT WASHINGTON TURNPIKE	WS-6 TROUT BROOK AT STATE PARK ROAD	WS-7 BLACK RIVER AT ROUTE 206 CROSSING	WS-8 BLACK RIVER 120 YDS BELOW CONF. WITH TROUT BROOK
DATE SAMPLED	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85	8/13/85
TENTATIVELY IDENTIFIED VOLATILES, ppb		NF	NF	NF		NF	NF
Trimethyl silanol	10				-		
Unknown	-				120		
TENTATIVELY IDENTIFIED ACIDS/BASE/NEUTRALS, ppb							
Unknown(s)	4553, 2226, 15581	10000, 7543, 3703, 21120	7768, 604, 2331, 13293	3617, 4174, 1739, 10713	4675, 4748 1899, 11249	929, 1062, 7433 9158, 3584, 22440, 796	3491, 4655, 1673, 11200
4-Hydroxy-4-methyl-2-pentanone	5666	-	5352	-	-	-	-
Sulfur, mol.(58)	-	640	-	-	-	-	-
NON-PRIORITY METALS, ppm							
Aluminum	4910	8940	3040	1720	8630	11300	6790
Barium	17	38	16	16	51	99	57
Calcium	ND	ND	ND	89	4380	2250	ND
Cobalt	4.3	6.5	ND	ND	9.5	10	8.7
Iron	9500	15700	5580	32300	16700	14600	29000
Magnesium	509[a]	1420[a]	364[a]	3010[a]	5190[a]	1780[a]	2020[a]
Manganese	148	185	84	216	1140	483	909
Potassium	522	888	359	196	1600	846	1030
Sodium	153	210	267	150	280	341	430
Tin	17	18	17	19	20	41	15[b]
Vanadium	17[a]	25[a]	11[a]	ND	39[a]	31[a]	39[a]
CONVENTIONALS							
pH (units)	6.82	6.20	7.18	7.17	7.40	6.61	7.40
Solids (%)	80	77	81	82	79	44	80

[a]Value is estimated because of interferences.
- = Not found.
ND = Not detected.
NF = None found.

302622

TABLE CC-21 (Page 1 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	SURFACE WATER STATION: W. BR. TROUT BK. (A)[a] (NORTH OF TINGUE RESIDENCE)			W. BR. TROUT BK. (D) (INFLOW TO POND)			W. BR. TROUT BK. (E) (ABOVE BRIDGE)			W. BR. TROUT BK. (G,H) (SE CORNER OF LANDFILL)			W. BR. TROUT BK. (Q) (AT TINGUE DRIVEWAY)		
	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
VOLATILES, ppb															
Benzene										ND	ND	2	141	141	1
Carbon tetrachloride										ND-128	64	2	ND	ND	1
Chlorobenzene										ND	ND	2	BM	5	1
Chloroform										ND	ND	2	11	11	1
1,1-Dichloroethane										ND	ND	2	112	112	1
1,2-Dichloroethane										ND	ND	2	12	12	1
1,2-Dichloropropane										ND	ND	2	14	14	1
Ethylbenzene										ND	ND	2	12	12	1
Methylene chloride										ND	ND	2	BM	5	1
Tetrachloroethylene										ND	ND	2	BM	5	1
Toluene										ND	ND	2	1350	1350	1
Trans-1,2-dichloro-ethylene										ND	ND	2	15	15	1
1,1,1-Trichloroethane										ND	ND	2	BM	5	1
Trichloroethylene										ND	ND	2	14	14	1
Trichlorofluoromethane[b]										ND	ND	2	16	16	1
ACID/PHENOLICS, ppb										ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb															
1,2-Dichlorobenzene													74	74	1
1,4-Dichlorobenzene										ND-9	4.5	2	16	16	1
Diethyl phthalate													11	11	1
Di-n-butyl phthalate													BM	5	1
PESTICIDES/PCBs, ppb															
α-endosulfan										1	1	1	ND	ND	1
METALS, ppm															
Antimony													BM	0.03	1
Arsenic	ND	ND	1	BM	0.0005	1	0.012	0.012	1	BM-0.008	0.0065	2	ND	ND	1
Cadmium	ND	ND	1	BM	0.005	1	0.01	0.01	1	ND-BM	0.0025	2	ND	ND	1
Chromium	ND	ND	1	0.01	0.01	1	0.02	0.02	1	0.05	0.05	1	BM	0.0035	1

[a]Letter refers to location of station on Figures in Chapter 5.
[b]Non-priority organic quantified.
ND - Not detected.
BM - Below method detection limit.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

302623

TABLE CC-21 (Page 2 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	SURFACE WATER STATION: W. BR. TROUT BK. (A)[a] (NORTH OF TINGUE RESIDENCE)			W. BR. TROUT BK. (D) (INFLOW TO POND)			W. BR. TROUT BK. (E) (ABOVE BRIDGE)			W. BR. TROUT BK. (G,H) (SE CORNER OF LANDFILL)			W. BR. TROUT BK. (Q) (AT TINGUE DRIVEWAY)		
	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
METALS, ppm (Continued)															
Copper	ND	ND	1							0.007	0.007	1	ND	ND	1
Lead	0.007	0.007	1	BM	0.025	1	BM	0.025	1	ND-0.02	0.005	2	BM	0.005	1
Mercury	ND	ND	1	BM	0.0005	1	BM	0.0005		ND-BM	0.0005	2	ND	ND	1
Selenium				BM	0.0005	1	0.001	0.001	1				BM	0.0025	1
Silver													0.006	0.006	1
Thallium													BM	0.0025	1
Zinc	0.05	0.05	1							0.031	0.031	1	0.069	0.069	1
MISCELLANEOUS, ppb															
Cyanides	ND	ND	1	ND	ND	1	ND	ND	1	ND-5	2.5	2	ND	ND	1
Phenols	40	40	1	20	20	1	10	10	1	ND	ND	1	ND	ND	1
CONVENTIONALS, ppm															
pH (Units)	6.3	6.3	1												
DO	6.7	6.7	1												
BOD	0	0	1							0-5.1	2.5	2			
COD	27	27	1							22-46	34	2			
TDS	83	83	1							581	581				
Hardness										86-384	235	2			
Alkalinity	19	19	1												
TSS	5	5	1							20	20	1			
Turbidity	4	4	1												
TOC										15	15	1			
Phosphates	2.5	2.5	1												
Total Coliform (c/100ml)	170	170	1							8-79	44	2			
Fecal Coliform (c/100ml)	0	0	1							0- 2	1	2			
Fecal Streptococcus (c/100ml)	1600	1600	1							0	0	2			
Chloride	10	10	1							18-106	62	2			
TS	88	88	1							70	70	1			
TKN	2	2	1							1.03	1.03	1			
Sulfate	9	9	1												
Ammonia as N	0	0	1							8.9	8.9	1			
Nitrate as N	0	0	1												
Ash	0	0	1												

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
BM - Below method detection limit.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

302624

TABLE CC-21 (Page 3 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

	SURFACE WATER STATION														
	W. BR. TROUT BK. (A)[a] (NORTH OF TINGUE RESIDENCE)			W. BR. TROUT BK. (D) (INFLOW TO POND)			W. BR. TROUT BK. (E) (ABOVE BRIDGE)			W. BR. TROUT BK. (G,H) (SE CORNER OF LANDFILL)			W. BR. TROUT BK. (Q) (AT TINGUE DRIVEWAY)		
COMPOUND OR GROUP	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
OTHER METALS, ppm															
Aluminum										1.418	1.418	1			
Barium				ND	ND	1	ND	ND	1						
Chromium^{+6}	ND	ND	1							0.005	0.005	1			
Iron	3	3	1							0.952	0.952	1			
Manganese	ND	ND	1							4.98	4.98	1			
Magnesium	4.3	4.3	1												
OTHER ORGANICS, ppb															
Heptane										ND-18	9	2			
Ether soluble	3000	3000	1												
RADIOACTIVITY, pCi/l															
Gross α										3.21		1			
Gross β										2.47±1.8		1			

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

302625

TABLE CC-21 (Page 4 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	SURFACE WATER STATION: W. BR. TROUT BK. (J,M,N)[a] (UPSTREAM OF TINGUE HOUSE) RANGE	AVERAGE	# OF ANALYSES	W. BR. TROUT BK. (P) (TRIBUTARY NEAR POND) RANGE	AVERAGE	# OF ANALYSES	E. BR. TROUT BK. (C) (NORTHWEST OF TOWNSHIP LINE) RANGE	AVERAGE	# OF ANALYSES	E. BR. TROUT BK. (F,L) (HEADWATERS) RANGE	AVERAGE	# OF ANALYSES	E. BR. TROUT BK. (K) (BELOW PROPERTY BOUNDARY) RANGE	AVERAGE	# OF ANALYSES
VOLATILES, ppb															
Benzene	ND-1.1	0.7	3	ND	ND	1				ND-7	3.5	2	11	11	1
Carbon tetrachloride	ND	ND	3	ND	ND	1				ND-184	92	2	ND	ND	1
Chlorobenzene	ND	ND	3	ND	ND	1				ND	ND	2	ND	ND	1
Dichlorobromomethane	ND	ND	3	ND	ND	1				ND-78	39	2	ND	ND	1
1,1-Dichloroethane	ND-12	4	3	ND	ND	1				ND-11	5.5	2	ND	ND	1
Methylene chloride	ND	ND	3	BM	5	1				ND	ND	2	ND	ND	1
Tetrachloroethylene	ND-2	0.67	3	ND	ND	1				ND	ND	2	ND	ND	1
Toluene	ND-14.5	9.3	3	ND	ND	1				ND-2	1	2	ND	ND	1
Trans-1,2-dichloro-ethylene	ND	ND	3	ND	ND	1				ND-21	10.5	2	120	120	1
ACID/PHENOLICS, ppb	ND	ND	1	ND	ND	1				ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb															
Bis (2-ethylhexyl) phthalate	ND	ND	1	ND	ND	1				90	90	1	ND	ND	1
PESTICIDES/PCBs, ppb	ND	ND	1	ND	ND	1				ND	ND	1	ND	ND	1
METALS, ppm															
Arsenic	BM	0.005	1	BM	0.0025	1	ND	ND	2	BM-0.02	0.01	2	0.01	0.01	1
Beryllium				BM	0.0025	1									
Cadmium	BM-0.004	0.0043	3	BM	0.0025	1	ND	ND	2	BM-0.01	0.005	2	0.01	0.01	1
Chromium	0.005-0.1	0.037	3	BM	0.0035	1	ND	ND	2	0.02	0.02	1	BM	0.01	1
Copper				0.031	0.031	1	ND	ND	1	0.016	0.016	1			
Lead	ND-0.13	0.043	3	0.27	0.27	1	0.004	0.004	1	0.006-0.02	0.013	2	0.03	0.03	1
Mercury	BM-0.001	0.0017	3	0.0004	0.0004	1	ND	ND	1	ND-BM	0.0013	2	BM	0.001	1
Nickel				0.013	0.013	1									
Thallium				BM	0.0025	1									
Zinc				0.25	0.25	1	0.05	0.05	1	0.107	0.107	1			

[a] Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
BM - Below method detection limit.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

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TABLE CC-21 (Page 5 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

	SURFACE WATER STATION														
	W. BR. TROUT BK. (J,M,N)[a] (UPSTREAM OF TINGUE HOUSE)			W. BR. TROUT BK. (P) (TRIBUTARY NEAR POND)			E. BR. TROUT BK. (C) (NORTHWEST OF TOWNSHIP LINE)			E. BR. TROUT BK. (F, L) (HEADWATERS)			E. BR. TROUT BK. (K) (BELOW PROPERTY BOUNDARY)		
COMPOUND OR GROUP	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
MISCELLANEOUS, ppb															
Cyanides	ND	ND	1	ND	ND	1	ND-3	1.5	2	6-70	38	2	30	30	1
Phenols	ND	ND	1	ND	ND	1	30	30	1	ND	ND	1	ND	ND	1
CONVENTIONALS, ppm															
pH (units)							6.4	6.4	2						
DO							0.2-0.3	0.25	2						
BOD	0-37.2	22.4	3				3	3	1	8.3-92	50.2	2	1.2	1.2	1
COD	25-76.4	57.9	3				31	31	1	105-305	205	2	50	50	1
TDS	197-221	211.7	3				274	274	1	552	552	1	359	359	1
Hardness	190	190	1							232-356	294	2	163	163	1
TSS							84	84	1	54	54	1			
TOC	8	8	1							46	46	1	26	26	1
Total Coliform (c/100ml)	0-400	167	3				<2000	<2000	2	0-1600	800	2	0	0	1
Fecal Coliform (c/100ml)	0	0	3				<200	<200	2	0-22	11	2	0	0	1
Fecal Streptococcus (c/100ml)	0	0	3				200	200	2	0-49	24.5	2	0	0	1
Turbidity							51-140	95.5	2						
Alkalinity							145-165	155	2						
Phosphates							1	1	1						
Chloride	13.6	13.6	1				37-41	39	1	109-132	120.5	2	91	91	1
TS							358	358	1	946	946	1			
TKN	34	34	1				4	4	2				7	7	1
Sulfate							4	4	2						
Nitrate as N	1.9	1.9	1				0	0	1	37.7	37.7	1	13.3	13.3	1
Ammonia as N							2.5-3	2.75	2						
Ash							54	54	1						

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

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TABLE CC-21 (Page 6 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	SURFACE WATER STATION: W. BR. TROUT BK. (J,M,N)[a] (UPSTREAM OF TINGUE HOUSE)			W. BR. TROUT BK. (P) (TRIBUTARY NEAR POND)			E. BR. TROUT BK. (C) (NORTHWEST OF TOWNSHIP LINE)			E. BR. TROUT BK. (F, L) (HEADWATERS)			E. BR. TROUT BK. (K) (BELOW PROPERTY BOUNDARY)		
	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
OTHER METALS, ppm															
Aluminum										0.091	0.091	1			
Iron	6	6	2				40-70	55	2	33.73	33.73	1			
Manganese	0.44-2	1.48	3				2.92	2.92	1	1.35	1.35	1	1.2	1.2	1
Magnesium							17	17	1						
Chromium^{+6}							ND	ND	2	0.016	0.016	1			
OTHER ORGANICS, ppb															
1,4-dichlorobutane	ND	ND	1							ND-20	10	2	ND	ND	1
Heptane	ND-14.5	9.3	3							ND-21	10.5	2	ND	ND	1
Nonane	ND	ND	1							ND-252	126	2	ND	ND	1
m, p-Xylene	ND	ND	1							ND-19	9.5	2	ND	ND	1
o-Xylene	ND	ND	1							ND-22	11	2	ND	ND	1
Propylbenzene										ND-11	5.5	2	ND	ND	1
Ethyl soluble							8000	8000	1						
RADIOACTIVITY, pCi/l															
Gross α	40.9 ± 11		1							2.94		1	2.28		1
Gross β	33.4 ± 3.7		1							34.9 ± 3.7		1	14 ± 2.6		1

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

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TABLE CC-21 (Page 7 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

	SURFACE WATER STATION														
	E. BR. TROUT BK. (R)[a] (TRIBUTARY ABOVE PARKER ROAD)			TROUT BK. (B) (30 yds BELOW CONF. OF E. & W. BRANCHES)			TROUT BK. (S) (100 Yds UPSTREAM OF LONG HILL RD)			TROUT BK. (T) (50 Yds UPSTREAM OF BRIDGE AT RANGER STATION)			TROUT BK. (U) (100 Yds UPSTREAM OF BLACK RIVER)		
COMPOUND OR GROUP	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
VOLATILES, ppb															
Methylene chloride	ND	ND	1				ND	ND	1	BM	1.4	1	BM	1.4	1
Trans-1,2-dichloro-ethylene	BM	5	1				ND	ND	1	ND	ND	1	ND	ND	1
1,1,1-Trichloroethane	BM	5	1				ND	ND	1	ND	ND	1	ND	ND	1
Trichlorofluoromethane[b]	BM	5	1				ND	ND	1	ND	ND	1	ND	ND	1
ACID/PHENOLICS, ppb	ND	ND	1				ND	ND	1	ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb	ND	ND	1				ND	ND	1	ND	ND	1	ND	ND	1
PESTICIDES/PCBs, ppb	ND	ND	1				ND	ND	1	ND	ND	1	ND	ND	1
METALS, ppm															
Antimony	BM	0.03	1				ND	ND	1	ND	ND	1	ND	ND	1
Arsenic	BM	0.0025	1	ND	ND	1	ND	ND	1	ND	ND	1	BM	0.0025	1
Beryllium	0.006	0.006	1				ND	ND	1	ND	ND	1	ND	ND	1
Cadmium	0.021	0.021	1	ND	ND	1	ND	ND	1	ND	ND	1	ND	ND	1
Chromium	0.023	0.022	1	ND	ND	1	ND	ND	1	ND	ND	1	ND	ND	1
Copper	0.12	0.12	1	ND	ND	1	ND	ND	1	ND	ND	1	ND	ND	1
Lead	0.32	0.32	1	0.005	0.005	1	ND	ND	1	ND	ND	1	ND	ND	1
Mercury	0.0007	0.0007	1	ND	ND	1	ND	ND	1	ND	ND	1	ND	ND	1
Nickel	0.022	0.022	1				ND	ND	1	ND	ND	1	ND	ND	1
Selenium	BM	0.0025	1				ND	ND	1	ND	ND	1	ND	ND	1
Silver	ND	ND	1				ND	ND	1	BM	0.004	1	ND	ND	1
Thallium	BM	0.0025	1				ND	ND	1	ND	ND	1	ND	ND	1
Zinc	0.59	0.59	1	0.025	0.025	1	ND	ND	1	ND	ND	1	ND	ND	1
MISCELLANEOUS, ppb															
Cyanides	ND	ND	1	3	3	1	ND	ND	1	ND	ND	1	ND	ND	1
Phenols	ND	ND	1	ND	ND	1	ND	ND	1	ND	ND	1	ND	ND	1

[a]Letter refers to location of station on Figures in Chapter 5.
[b]Non-priority organic quantified.
ND - Not detected.
BM - Below method detection limit.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

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TABLE CC-21 (Page 8 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

	SURFACE WATER STATION														
	E. BR. TROUT BK. (R)[a] (TRIBUTARY NEAR PARKER ROAD)			TROUT BK. (B) (30 yds BELOW CONF. OF E. & W. BRANCHES)			TROUT BK. (S) (100 Yds UPSTREAM OF LONG HILL RD)			TROUT BK. (T) (50 Yds UPSTREAM OF BRIDGE AT RANGER STATION)			TROUT BK. (U) (100 Yds UPSTREAM OF BLACK RIVER)		
COMPOUND OR GROUP	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
CONVENTIONALS, ppm															
pH (Units)				6.3	6.3	1									
DO				9.8	9.8	1									
BOD				0	0	1									
COD				12	12	1									
TDS				75	75	1									
TSS				19	19	1									
Turbidity				19	19	1									
Alkalinity				35	35	1									
Phosphates				1.2	1.2	1									
Total Coliform (c/100ml)				330	330	1									
Fecal Coliform (c/100ml)				80	80	1									
Fecal Streptococcus (c/100ml)				140	140	1									
Chloride				13	13	1									
TS				88	88	1									
Sulfate				8	8	1									
Nitrate as N				1.5	1.5	1									
Ammonia as N				0	0	1									
Ash				13	13	1									
OTHER METALS, ppm															
Chromium^{+6}				ND	ND	1									
Iron				0.6	0.6	1									
Manganese				ND	ND	1									
Magnesium				3.6	3.6	1									
OTHER ORGANICS, ppb															
Ether soluble				3000	3000	1									

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
Blank - Not run.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

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SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

	SURFACE WATER STATION					
	BLACK RIVER (V)[a] (300 Yds UPSTREAM OF CONF. WITH TROUT BK.)			BLACK RIVER (W) (100 Yds DOWNSTREAM OF CONF. WITH TROUT BK.)		
COMPOUND OR GROUP	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
VOLATILES, ppb						
Benzene	ND	ND	1	ND	ND	1
Chlorobenzene	ND	ND	1	ND	ND	1
Chloroethane	ND	ND	1	ND	ND	1
Chloroform	ND	ND	1	ND	ND	1
Dichlorodifluoro-methane[a]	ND	ND	1	ND	ND	1
1,1-Dichloroethane	ND	ND	1	ND	ND	1
1,2-Dichloropropane	ND	ND	1	ND	ND	1
Ethylbenzene	ND	ND	1	ND	ND	1
Methylene chloride	ND	ND	1	BM	1.4	1
Tetrachloroethylene	ND	ND	1	ND	ND	1
Toluene	ND	ND	1	ND	ND	1
Trans-1,2-dichloro-ethylene	ND	ND	1	ND	ND	1
1,1,1-Trichloroethane	ND	ND	1	ND	ND	1
Trichloroethylene	ND	ND	1	ND	ND	1
Trichlorofluoromethane[b]	ND	ND	1	ND	ND	1
Vinyl chloride	ND	ND	1	ND	ND	1
ACID/PHENOLICS, ppb	ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb						
1,2-Dichlorobenzene	ND	ND	1	ND	ND	1
1,4-Dichlorobenzene	ND	ND	1	ND	ND	1
Diethyl phthalate	ND	ND	1	ND	ND	1
Di-n-butyl phthalate	ND	ND	1	ND	ND	1
Naphthalene	ND	ND	1	ND	ND	1
PESTICIDES/PCBs, ppb						
α-Endosulfan	ND	ND	1	ND	ND	1

[a]Letter refers to location of station on Figures in Chapter 5.
[b]Non-priority organic quantified.
ND - Not detected.
BM - Below method detection limit.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

TABLE CC-21 (Page 10 of 10)

SUMMARY OF PREVIOUS SURFACE WATER SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	SURFACE WATER STATION: BLACK RIVER (V)[a] (300 Yds UPSTREAM OF CONF. WITH TROUT BK.) RANGE	AVERAGE	# OF ANALYSES	BLACK RIVER (W) (100 Yds DOWNSTREAM OF CONF. WITH TROUT BK.) RANGE	AVERAGE	# OF ANALYSES
METALS, ppb						
Antimony	ND	ND	1	ND	ND	1
Arsenic	ND	ND	1	ND	ND	1
Beryllium	ND	ND	1	ND	ND	1
Cadmium	ND	ND	1	ND	ND	1
Chromium	ND	ND	1	ND	ND	1
Copper	ND	ND	1	ND	ND	1
Lead	BM	0.0025	1	ND	ND	1
Mercury	ND	ND	1	BM	0.00015	1
Nickel	ND	ND	1	ND	ND	1
Selenium	ND	ND	1	ND	ND	1
Thallium	ND	ND	1	ND	ND	1
Zinc	ND	ND	1	ND	ND	1
MISCELLANEOUS, ppb						
Cyanides	ND	ND	1	ND	ND	1
Phenols	ND	ND	1	ND	ND	1

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
BM - Below method detection limit.
Note: In computing averages, the values used for BM are 1/2 the detection limit and a zero value is used for NDs.

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TABLE CC-22 (Page 1 of 2)

SUMMARY OF PREVIOUS SURFACE WATER SEDIMENT SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	W. BR. TROUT BK (Q)[a] (AT TINGUE DRIVEWAY) RANGE	AVERAGE	# OF ANALYSES	W. BR. TROUT BK (P) (TRIBUTARY ABOVE POND) RANGE	AVERAGE	# OF ANALYSES	E. BR. TROUT BK. (R) (TRIBUTARY ABOVE PARKER ROAD) RANGE	AVERAGE	# OF ANALYSES
VOLATILES, ppb									
Benzene	BM	25	1	ND	ND	1	BM	25	1
Methylene chloride	66	66	1	BM	25	1	51	51	1
Toluene	341	341	1	BM	25	1	ND	ND	1
1,1,1-Trichloroethane	BM	25	1	BM	25	1	ND	ND	1
ACID/PHENOLICS, ppb	ND	ND	1	ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb									
Acenaphthene	ND	ND	1	BM	5000	1	ND	ND	1
Bis (2-ethylhexyl) phthalate	ND	ND	1	ND	ND	1	17,400	17,400	1
Butylbenzyl phthalate	ND	ND	1	ND	ND	1	BM	1850	1
Di-n-butyl phthalate	ND	ND	1	BM	5000	1	BM	1850	1
Di-n-octyl phthalate	ND	ND	1	ND	ND	1	BM	1850	1
Phenanthrene	ND	ND	1	BM	5000	1	BM	1850	1
Fluoranthene	ND	ND	1	ND	ND	1	ND	ND	1
Pyrene	ND	ND	1	ND	ND	1	ND	ND	1
PESTICIDES/PCBs, ppb									
Delta-BHC	ND	ND	1	BM	5000	1	ND	ND	1
METALS, ppm									
Antimony	BM	3.5	1	BM	3.5	1	7	7	1
Arsenic	BM	10	1	4.6	4.6	1	100	100	1
Beryllium	BM	0.25	1	1.2	1.2	1	BM	0.25	1
Cadmium	ND	ND	1	BM	0.25	1	BM	0.25	1
Chromium	5.4	5.4	1	11	11	1	27	27	1
Copper	2.6	2.6	1	10	10	1	26	26	1
Lead	11	11	1	73	73	1	49	49	1
Mercury	0.5	0.5	1	0.2	0.2	1	0.2	0.2	1
Nickel	3.3	3.3	1	6.6	6.6	1	17	17	1
Selenium	BM	0.25	1	3.8	3.8	1	3	3	1
Thallium	BM	0.25	1	BM	0.25	1	BM	0.25	1
Zinc	24	24	1	57	57	1	110	110	1
MISCELLANEOUS, ppb									
Cyanides	ND	ND	1	ND	ND	1	ND	ND	1
Phenols	ND	ND	1	ND	ND	1	ND	ND	1

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
BM - Below method detection limit.
Note: In computing averages, the values used for BM are 1/2 the detection limit, and a zero value is used for NDs.

TABLE CC-22 (Page 2 of 2)

SUMMARY OF PREVIOUS SURFACE WATER SEDIMENT SAMPLES

Combe Fill South Landfill

COMPOUND OR GROUP	TROUT BK. (S) (100 Yds UPSTREAM OF LONG HILL RD)[a]			TROUT BK. (T) (50 Yds UPSTREAM BRIDGE OF AT RANGER STATION)			BLACK RIVER (V) (300 Yds UPSTREAM OF CONF. WITH TROUT BROOK)		
	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES	RANGE	AVERAGE	# OF ANALYSES
VOLATILES, ppb									
Benzene	ND	ND	1	ND	ND	1			
Methylene chloride	22.6	22.6	1	8	8	1	20.8	20.8	1
Toluene	ND	ND	1	ND	ND	1			
1,1,1-Trichloroethane	ND	ND	1	ND	ND	1			
ACID/PHENOLICS, ppb	ND	ND	1	ND	ND	1	ND	ND	1
BASE/NEUTRALS, ppb									
Acenaphthene	ND	ND	1	ND	ND	1			
Bis (2-ethylhexyl) phthalate	ND	ND	1	ND	ND	1			
Butylbenzyl phthalate	ND	ND	1	ND	ND	1			
Di-n-butyl phthalate	ND	ND	1	ND	ND	1			
Di-n-octyl phthalate	ND	ND	1	ND	ND	1			
Phenanthrene	ND	ND	1	ND	ND	1	BM	270	1
Fluoranthene	BM	22	1	ND	ND	1	355	355	1
Pyrene	BM	19	1	BM	19	1	303	303	1
PESTICIDES/PCBs, ppb							ND	ND	1
Delta-BHC	ND	ND	1	ND	ND	1			
METALS, ppm									
Antimony	10	10	1	BM	4	1	10	10	1
Arsenic	BM	0.5	1	1.4	1.4	1	1.6	1.6	1
Beryllium	0.6	0.6	1	0.3	0.3	1	0.3	0.3	1
Cadmium	BM	0.15	1	BM	0.15	1	BM	0.15	1
Chromium	18	18	1	18	18	1	10	10	1
Copper	30	30	1	14	14	1	30	30	1
Lead	28	28	1	12	12	1	9.6	9.6	1
Mercury	ND	ND	1	ND	ND	1			
Nickel	10	10	1	9	9	1	7	7	1
Selenium	ND	ND	1	0.6	0.6	1	BM	0.3	1
Thallium	ND	ND	1	ND	ND	1	BM	0.25	1
Zinc	60	60	1	52	52	1	55	55	1
MISCELLANEOUS, ppb									
Cyanides	ND	ND	1	ND	ND	1	500	500	1
Phenols	ND	ND	1	ND	ND	1	100	100	1

[a]Letter refers to location of station on Figures in Chapter 5.
ND - Not detected.
BM - Below method detection limit.
Note: In computing averages, the values used for BM are 1/2 the detection limit, and a zero value is used for NDs.
[illegible] - not run.

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TABLE CC-23 (Page 1 of 7)

SUMMARY OF AIR QUALITY DATA

Combe Fill South Landfill

PARAMETER	A-3[a]	A-4[a]	A-4[a] DUPLICATE	A-5[a]	A-5	A-5 DUPLICATE	A-6	A-7	A-8	A-9	A-10	A-11	A-11 DUPLICATE
DATE SAMPLED	7/24/84	7/24/84	7/24/84	7/24/84	9/17/85	9/17/85	9/17/85	9/17/85	9/18/85	9/19/85	9/18/85	9/19/85	9/19/85
VOLATILES[b], $\mu g/m^3$													
Acetone[c]					ND	2	ND	ND	ND		ND		
Benzene	144	ND	ND	ND	ND	ND	ND	2	ND		ND		
2-Butanone[c]					1	ND	ND	0.9	1		1		
Carbon disulfide[c]					ND	1	ND	ND	ND		ND		
Chlorobenzene	ND	BM @ 60	ND	ND	ND	ND	ND	ND	ND		ND		
Chloroform	ND	BM @ 60	ND	ND	ND	ND	ND	ND	ND		ND		
Ethylbenzene	276	ND	ND	ND	19	10	16	14	22		11		
Methylene chloride	BM @ 60	BM @ 60	ND	BM @ 60	ND	1	ND	ND	5		ND		
Tetrachloroethylene	BM @ 60	BM @ 60	ND	ND	4	3	ND	5	7		7		
Toluene	216	BM @ 60	ND	BM @ 60	46	27	12	34	49		22		
Trans-1,2-dichloro-ethylene	BM @ 60	ND	ND	ND	ND	ND	ND	ND	ND		ND		
Trichloroethylene	BM @ 60	BM @ 60	ND	ND	ND	ND	ND	ND	2		2		
Xylenes[c]					86	46	360	65	89		30		
ACID/PHENOLICS[d], $\mu g/m^3$					ND	ND	ND	ND	ND	ND	ND	ND	ND
BASE/NEUTRALS[d], $\mu g/m^3$													
Bis-2-ethylhexyl-phthalate					0.009[e]	0.011[e]	0.004[e]	0.006[e]	0.059	ND	0.056	0.005[e]	0.011[e]
Diethyl phthalate					ND	0.004[e]	0.002[e]	ND	0.013[e]	ND	0.011[e]	0.002[e]	ND
Di-n-butylphthalate					ND	ND	ND	ND	ND	ND	ND	0.002[e]	ND
PESTICIDES/PCBs[d], $\mu g/m^3$					ND	ND	ND	ND	ND	ND	ND	ND	ND

[a]Data converted from ppm to $\mu g/m^3$. (1ppm = 1 $\mu g/g$ x 0.0012 g/cm^3 x 10^6 cm^3/m^3 = $\mu g/m^3$.

[b]Volatiles analyses were done using either charcoal (24 Jul 84) or Tenax (all other dates) tubes.

[c]Non-priority organic quantified.

[d]Samples collected on filters.

[e]Estimated value. Value is below method detection limit.

ND = Not detected.

BM = Below method detection limit.

Blank = Not run.

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TABLE CC-23 (Page 2 of 7)

SUMMARY OF AIR QUALITY DATA

Combe Fill South Landfill

PARAMETER	A-3[a]	A-4[a]	A-4[a] DUPLICATE	A-5[a]	A-5	A-5 DUPLICATE	A-6	A-7	A-8	A-9	A-10	A-11	A-11 DUPLICATE
DATE SAMPLED	7/24/84	7/24/84	7/24/84	7/24/84	9/17/85	9/17/85	9/17/85	9/17/85	9/18/85	9/19/85	9/18/85	9/19/85	9/19/85
METALS[b], $\mu g/m^3$													
Antimony					ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium					0.0049	0.0048	0.0045	0.0041	0.0044	0.0044	0.0058	0.0034	0.0034
Cadmium					0.0052	0.0073	0.0073	0.0073	0.0034	0.015	0.0036	0.013	0.014
Chromium					0.0071	0.012	0.019	0.0079	0.013	0.0077	0.020	0.013	0.012
Copper					0.059	0.043	0.067	0.132	0.147	0.406	0.154	0.036	0.036
Lead					0.191	0.194	0.252	0.077	0.057	0.281	0.448	0.083	0.088
Nickel					ND	ND	0.013	0.014	ND	0.014	0.011	ND	0.014
Zinc					19.5	18.2	16.4	15.9	16.1	15.3	18.4	17.3	17.5
MISCELLANEOUS[b], $\mu g/m^3$													
Cyanides					ND	ND	ND	ND	ND	ND	ND	ND	ND
TENTATIVELY IDENTIFIED VOLATILES[c] ($\mu g/m^3$)			NF										
Unknown(s)	-	-		-	4.4, 3.1, 3.5, 3.0, 7.6, 5.6	339, 23, 8.5, 8.5, 4.8	225, 8.2, 14.7, 41, 74, 16, 34, 28	1.8, 1.8, 1.8, 1.4, 1.8, 1.4, 2.5, 6.9, 9.5, 18, 7.3	1.8, 2.7, 1.8, 1.8, 4.7, 5.3, 7.6, 8.2, 21.6, 11.7		2.0, 2.0, 1.6, 1.1, 2.0, 5.0, 1.5, 3.0, 5.2, 10.5		
2-Propanone	-	-		-	4.8	-	-	1.8	2.7		-		
Tetrachloroethylene	-	-		-	-	-	32.7	-	-		-		
2-Propenylidene-cyclobutene	-	-		-	-	-	229	-	-		-		
Acetic acid ethylether	-	-		-	-	-	-	2.3	-		-		
Methylcyclopentene	-	-		-	-	-	-	1.8	1.8		-		
Dichloromethane (methylene chloride)	-	-		-	-	-	-	-	-		3.2		
Dimethoxymethane	-	-		-	-	-	-	-	1.8		-		
Heptane	-	-		-	-	-	-	-	2.3		-		
Hexane	-	-		-	-	-	-	-	2.9		-		
Trichlorofluoromethane	d	-		-	-	-	-	-	-		-		

[a]Data converted from ppm to $\mu g/m^3$. (1ppm = 1 $\mu g/g \times 0.0012\ g/cm^3 \times 10^6\ cm^3/m^3 = \mu g/m^3$.
[b]Samples collected on filters.
[c]Volatiles analyses were done using either charcoal (24 Jul 84) or Tenax (all other dates) tubes.
[d]Compound identified but not quantified.
Blank = Not run.
ND = Not detected.
\- = Not found.

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TABLE CC-23 (Page 3 of 7)

SUMMARY OF AIR QUALITY DATA

Combe Fill South Landfill

PARAMETER	A-3[a]	A-4[a]	A-4[a] DUPLICATE	A-5[a]	A-5	A-5 DUPLICATE	A-6	A-7	A-8	A-9	A-10	A-11	A-11 DUPLICATE
DATE SAMPLED	7/24/84	7/24/84	7/24/84	7/24/84	9/17/85	9/17/85	9/17/85	9/17/85	9/18/85	9/19/85	9/18/85	9/19/85	9/19/85
TENTATIVELY IDENTIFIED VOLATILES[c], $\mu g/m^3$ (Continued)													
1,1,2-Trichloro-1,2,2-trifluoro-methane (Freon TF)	c	-		c	-	-	-	-	-		-		
1,1-Dichloro-1-nitroethane	c	-		-	-	-	-	-	-		-		
1-Ethyl-N, N-di-methyl-1-(1-methyl-2-propenyl)-boranamine	c	-		-	-	-	-	-	-		-		
2,2,3-Trimethylhexane	c	-		-	-	-	-	-	-		-		
2,3,3,4-Tetramethyl-pentane	c	-		-	-	-	-	-	-		-		
1-(Hexyloxy)-2-methyl-hexane	c	-		-	-	-	-	-	-		-		
3,4,5-Trimethyl-1-hexane	c	-		-	-	-	-	-	-		-		
3,4-Nonadiene	c	-		-	-	-	-	-	-		-		
1-(Hexyloxy)-5-methylhexane	c	c		-	-	-	-	-	-		-		
1,1,3-Trimethylcyclo-pentane	-	c		-	-	-	-	-	-		-		
1,3,5-Cycloheptatriene	-	c		-	-	-	-	-	-		-		
1,3-Dimethyl-cis-cyclohexane	-	c		-	-	-	-	-	-		-		
TENTATIVELY IDENTIFIED[d] ACIDS/BASE/NEUTRALS, $\mu g/m^3$ Unknowns(s)					0.023, 0.153, 0.031, 0.104, 0.010, 0.011, 0.014, 0.016, 0.020	0.041, 0.380, 0.026, 0.295, 0.203, 0.561, 0.018, 0.017, 0.017, 0.023	0.046, 0.055, 0.476, 0.236, 0.649, 0.021, 0.030, 0.023, 0.043, 0.050	0.018, 0.048, 0.039, 0.025, 0.270, 0.010, 0.020, 0.025, 0.036, 0.010	0.017, 0.061, 0.028, 0.030, 0.017, 0.017, 0.023, 0.025, 0.007, 0.008 0.010	0.163, 0.013, 0.061	0.010, 0.111, 0.013, 0.044, 0.036, 0.011, 0.028, 0.033, 0.016, 0.036 0.011	0.033, 0.410, 0.215, 0.725, 0.029, 0.021, 0.023	0.053, 0.011, 0.290, 0.226, 0.087, 0.011, 0.016

[a]Data converted from ppm to $\mu g/m^3$. (1ppm = 1 $\mu g/g$ x 0.0012 g/cm^3 x 10^6 cm^3/m^3 = $\mu g/m^3$.
[b]Volatiles analyses were done using either charcoal (24 Jul 84) or Tenax (all other dates) tubes.
[c]Compound identified but not quantified.
[d]Samples collected on filters.
- = Not found.
Blank = Not run.

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TABLE CC-23 (Page 4 of 7)

SUMMARY OF AIR QUALITY DATA

Combe Fill South Landfill

PARAMETER	A-3[a]	A-4[a]	A-4[a] DUPLICATE	A-5[a]	A-5	A-5 DUPLICATE	A-6	A-7	A-8	A-9	A-10	A-11	A-11 DUPLICATE
DATE SAMPLED	7/24/84	7/24/84	7/24/84	7/24/84	9/17/85	9/17/85	9/17/85	9/17/85	9/18/85	9/19/85	9/18/85	9/19/85	9/19/85
TENTATIVELY IDENTIFIED ACIDS/BASE/NEUTRALS,[b] $\mu g/m^3$ (Continued)													
4-Hydroxy-4-methyl-2-pentanone					0.158	-	0.316	-	0.198	0.145	0.251	0.362	-
(1-Methylethyl) benzene					0.315	-	-	0.034	0.021	0.184	-	-	0.424
1-Chloro-2-propanone					-	0.089	-	-	-	-	-	-	-
2-Methyl-1-pentene					-	-	-	-	-	-	-	-	0.031
NON-PRIORITY METALS[b], $\mu g/m^3$													
Aluminum					13.6	13.1	11.5	10.9	11.1	10.5	13.4	11.6	12.1
Barium					26.4	25.1	22.4	21.6	21.8	20.7	25.3	22.9	23.4
Calcium					9.39	8.69	8.01	7.73	8.2	7.53	9.44	8.68	8.94
Cobalt					0.012	0.0096	0.014	0.0082	0.0063	0.0039	0.015	0.0053	0.0068
Iron					0.742	0.810	1.33	0.813	0.977	0.775	1.86	0.780	0.983
Magnesium					1.03	0.913	0.944	0.890	0.988	1.15	1.23	1.05	1.09
Manganese					0.021	0.017	0.030	0.022	0.037	0.023	0.052	0.027	0.028
Potassium					16.0	15.2	13.3	13.2	13.3	12.2	15.5	13.3	13.4
Sodium					52.7	48.4	42.8	41.8	42.6	38.4	49.1	41.5	42.6
Tin					ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium					ND	ND	ND	ND	0.0054	ND	0.007	0.0058	0.0076

[a]Data converted from ppm to $\mu g/m^3$. (1ppm = 1 $\mu g/g$ x 0.0012 g/cm^3 x 10^6 cm^3/m^3 = $\mu g/m^3$.

[b]Samples collected on filters.

ND = Not detected.

\- = Not found.

Blank = Not run.

302638

SUMMARY OF AIR QUALITY DATA

Combe Fill South Landfill

PARAMETER	A-12	A-12 DUPLICATE	A-13	U/D-5-UW[a]	U/D-2-DW[a]	U/D-3-UW	U/D-1-DW	U/D-4-UW	U/D-2-DW	U/D-1-UW	U/D-3-DW
DATE SAMPLED	9/18/85	9/18/85	9/19/85	7/24/84	7/24/84	9/17/85	9/17/85	9/18/85	9/18/85	9/19/85	9/19/85
VOLATILES[b], $\mu g/m^3$											
Acetone[c]	ND	ND				ND	ND	2	ND		
Benzene	ND	ND		ND	ND	ND	ND	ND	ND		
2-Butanone[c]	1	0.7[d]				1	2	1	ND		
Carbon disulfide[c]	ND	ND				ND	ND	ND	ND		
Chlorobenzene	ND	ND		ND	ND	ND	ND	ND	ND		
Chloroform	ND	ND		ND	ND	ND	ND	ND	ND		
Ethylbenzene	11	7		ND	ND	10	13	9	10		
Methylene chloride	ND	2		BM @ 60	BM @ 60	ND	ND	2	ND		
4-Methyl-2-pentanone[c]	ND	ND				ND	ND	ND	1		
Tetrachloroethylene	5	4		ND	ND	6	18	6	6		
Toluene	21	15		BM @ 60	BM @ 60	29	47	20	22		
Trans-1,2-dichloro-ethylene	ND	ND		ND	ND	ND	ND	ND	ND		
Trichloroethylene	ND	0.9		ND	ND	ND	ND	1	ND		
Xylenes	35	34		ND	ND	52	59	44	48		
ACID/PHENOLICS[e], $\mu g/m^3$	ND	ND				ND	ND	ND	ND		
BASE/NEUTRALS[e], $\mu g/m^3$											
Bis-2-ethylhexyl-phthalate	0.007[d]	0.009[d]	0.006[d]			0.040	0.008[d]	ND	0.004[d]	0.022[d]	0.055
Diethyl phthalate	0.014[d]	0.009[d]	0.002[d]			0.003[d]	ND	0.005[d]	0.011[d]	0.003[d]	0.004[d]
Di-n-butylphthalate	0.007[d]	0.007[d]	0.004[d]			ND	ND	0.003[d]	ND	ND	0.002[d]
PESTICIDES/PCBs[e], $\mu g/m^3$	ND	ND	ND			ND	ND	ND	ND	ND	ND
METALS[e], g/m3											
Antimony	0.069	ND	ND			ND	0.042	ND	0.061	ND	ND
Beryllium	0.0057	0.0059	0.0035			0.0078	0.0064	0.0086	0.005	0.0069	0.0055
Cadmium	0.0072	0.0054	0.0094			0.020	0.0093	0.004	0.0047	0.0066	0.010
Chromium	0.287	0.026	0.012			0.020	0.011	0.011	0.017	0.013	0.025
Copper	0.145	0.139	0.087			0.223	0.164	0.057	0.047	0.162	0.139

[a]Data converted from ppm to $\mu g/m^3$. (1ppm = 1 $\mu g/g$ x 0.0012 g/cm^3 x 10^6 cm^3/m^3 = $\mu g/m^3$.
[b]Volatiles analyses were done using either charcoal (24 Jul 84) or Tenax (all other dates) tubes.
[c]Non-priority organic quantified.
[d]Estimated value. Value is below method detection limit.
[e]Samples collected on filters.
ND = Not detected.
BM = Below method detection limit.
Blank = Not run.

TABLE CC-23 (Page 6 of 7)

SUMMARY OF AIR QUALITY DATA

Combe Fill South Landfill

PARAMETER	A-12	A-12 DUPLICATE	A-13	U/D-5-UW[a]	U/D-2-DW[a]	U/D-3-UW	U/D-1-DW	U/D-4-UW	U/D-2-DW	U/D-1-UW	U/D-3-DW
DATE SAMPLED	9/18/85	9/18/85	9/19/85	7/24/84	7/24/84	9/17/85	9/17/85	9/18/85	9/18/85	9/19/85	9/19/85
METALS[b], $\mu g/m^3$ (continued)											
Lead	0.141	0.086	0.051			0.155	0.259	0.621	0.458	0.091	0.191
Nickel	0.029	0.0093	0.018			0.025	0.026	0.011	0.015	ND	0.066
Zinc	20.5	19.2	13.1			25.3	23.8	25.9	15.6	24.6	18.1
MISCELLANEOUS[b], $\mu g/m^3$											
Cyanides	ND	ND	ND			ND	ND	ND	ND	ND	ND
TENTATIVELY IDENTIFIED VOLATILES[c], $\mu g/m^3$					NF						
Unknown(s)	1.4, 1.8, 1.8, 1.8, 1.6, 1.2, 2.0, 1.3, 3.7, 4.9, 4.9, 16.3, 6.9	1.6, 1.1, 1.1, 1.1, 0.6, 1.1, 2.6, 3.0, 3.7, 9.6, 5.1		-		1.7, 1.5, 2.0, 2.1, 2.1, 3.2, 1.2, 3.5, 2.1, 2.1, 3.5, 7.1, 11.2, 4.4	1.5, 1.5, 3.4, 4.2, 3.8, 9.7, 3.4, 9.7, 7.7, 12.5, 3.4	2.2, 1.1, 1.4, 4.5, 3.1, 4.0, 4.9, 13.0	1.8, 1.8, 2.1, 2.0, 4.0, 10.7		
2-Butene	-	1.1		-		-	3.0	-	-		
Trichloromethane (chloroform)	-	-		-		-	3.7	-	-		
Acetic acid ethylether	-	-		-		-	8.9	-	-		
2-Propanone	-	1.1		-		2.2	-	1.1	1.8		
Dimethoxymethane	1.4	1.3		-		-	-	2.2	-		
Trichloroethylene	-	-		-		-	-	-	2.3		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon TF)	-	-		d		-	-	-	-		
1,1-Dichloro-1-nitroethane	-	-		d		-	-	-	-		
2-Methyl-3-(1-methylethyl)-oxirane	-	-		d		-	-	-	-		
Hexane	-	-		-		-	4.2	-	-		

[a]Data converted from ppm to $\mu g/m^3$. (1ppm = 1 $\mu g/g$ x 0.0012 g/cm^3 x 10^6 cm^3/m^3 = $\mu g/m^3$.

[b]Samples collected on filters.

[c]Volatiles analyses were done using either charcoal (24 Jul 84) or Tenax (all other data) tubes.

[d]Compound identified but not quantified.

ND = Not detected.

\- = Not found.

Blank = Not run.

NF = None found.

302640

TABLE CC-23 (Page 7 of 7)

SUMMARY OF AIR QUALITY DATA

Combe Fill South Landfill

PARAMETER	A-12	A-12 DUPLICATE	A-13	U/D-5-UW[a]	U/D-2-DW[a]	U/D-3-UW	U/D-1-DW	U/D-4-UW	U/D-2-DW	U/D-1-UW	U/D-3-DW
DATE SAMPLED	9/18/85	9/18/85	9/19/85	7/24/84	7/24/84	9/17/85	9/17/85	9/18/85	9/18/85	9/19/85	9/19/85
TENTATIVELY IDENTIFIED[b] ACIDS/BASE/NEUTRALS, $\mu g/m^3$											
Unknowns(s)	0.018,0.022, 0.014,0.152, 0.063,0.04, 0.014,0.031, 0,052,0.011, 0.031,0.026	0.016,0.021, 0.052,0.03, 0.177,0.026, 0.017,0.023, 0,035,0.02, 0.056,0.012, 0.009	0.032, 0.274, 0.267, 0.130, 0.540, 0.020, 0.021			0.060, 0.587, 0.433, 0.280, 0.844, 0.027, 0.021, 0.039, 0.095, 0.089	0.018, 0.362, 0.258, 0.086, 0,458, 0.012, 0.027, 0.027, 0.045, 0.018	0.018, 0.144, 0.142, 0.016	0.019, 0.110, 0.039, 0.025, 0.014, 0.011, 0.014	0.077, 0.450, 0.423, 0.110, 0.271, 0.986, 0.030	0.095, 0.012, 0.012, 0.012, 0.321, 0.181, 0.015, 0.025
4-Hydroxy-4-methyl-2-pentanone	0.305	-	-			-	-	-	0.238	-	0.223
(1-Methylethyl)-benzene	0.044	0.044	-			-	-	0.019	0.029	-	0.476
Phosphoricacid-tributhylester	0.017	-	-			-	-	-	0.009	-	-
1-Chloro-2-propanone	-	-	-			-	0.036	-	-	-	-
3-Methyloctane	-	-	-			-	0.181	-	-	-	-
NON-PRIORITY METALS[b], $\mu g/m^3$											
Aluminum	15.7	13.4	0.883			16.9	16.9	18.6	11.2	16.8	12.4
Barium	28.2	26.5	17.6			34.7	32.7	35.5	21.4	33.4	24.7
Calcium	11.1	9.7	6.88			12.3	11.5	12.5	7.85	11.9	9.03
Cobalt	0.017	0.014	ND			0.017	0.012	0.014	0.0066	0.017	0.012
Iron	3.76	1.17	0.627			1.81	0.872	2.16	1.64	0.762	1.41
Magnesium	1.84	1.11	0.763			1.52	1.26	1.46	0.970	1.22	1.04
Manganese	0.063	0.043	0.019			0.043	0.031	0.045	0.017	0.020	0.034
Potassium	17.5	15.9	10.4			20.9	19.2	20.9	13.2	19.7	14.9
Sodium	54.7	50.1	33.7			67.6	60.1	66.6	42.4	63.0	47.4
Tin	ND	ND	ND			ND	ND	ND	ND	ND	ND
Vanadium	0.011	ND	ND			ND	ND	ND	0.0057	ND	ND

[a]Data converted from ppm to $\mu g/m^3$. (1ppm = 1 $\mu g/g \times 0.0012\ g/cm^3 \times 10^6\ cm^3/m^3 = \mu g/m^3$.

[b]Samples collected on filters.

ND = Not detected.

\- = Not found.

Blank = Not run.

302641

TABLE CC-24 (Page 1 of 3)

SUMMARY OF QUALITY CONTROL DATA FOR AQUEOUS MATRICES

Combe Fill South Landfill

PARAMETER	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK
DATE SAMPLED	8/13/85	8/13/85	8/20/85	8/20/85	8/21/85	8/21/85	8/22/85	8/22/85	8/28/85	8/28/85	8/29/85
VOLATILES, ppb											
Methylene chloride	BM @ 2.8	BM @ 2.8	ND	ND	5.80	ND	4.40	14.2	6.93	ND	BM @ 2.8
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane[a]	ND	BM @ 10	ND	ND	ND	BM @ 10	ND	ND	ND	ND	ND
ACID/PHENOLICS, ppb											
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BASE/NEUTRALS, ppb											
Bis (2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	ND	BM @ 10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	BM @ 10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[a]Non-priority organic quantified.

ND = Not detected.

BM = Below method detection limit.

302642

TABLE CC-24 (Page 2 of 3)

SUMMARY OF QUALITY CONTROL FOR AQUEOUS MATRICES

Combe Fill South Landfill

PARAMETER	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	POTABLE WATER[a]
DATE SAMPLED	8/29/85	9/4/85	9/4/85	9/5/85	9/5/85	9/25/85	9/25/85	10/17/85	10/17/85	8/28/85
VOLATILES, ppb										
Methylene chloride	11.4	3.20	3.80	BM @ 2.8	BM @ 2.8	20.5	9.79	3.50	3.82	24.8
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	BM @ 3.8	BM @ 3.8	ND	ND	ND
Trichlorofluoromethane[b]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACID/PHENOLICS, ppb										
Pentachlorophenol	ND	ND	10.5	ND	10.2	ND	ND	ND	ND	ND
Phenol	ND	ND	ND	ND	21.5	ND	ND	ND	7.49	ND
BASE/NEUTRALS, ppb										
Bis (2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	BM @ 10	BM @ 10	BM @ 10	BM @ 10	BM @ 10
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	17.2	ND
Di-ethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.8
PESTICIDES/PCBs, ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METALS, ppm										
Copper										BM @ 0.006
Lead										BM @ 0.005
Mercury										BM @ 0.0002
Selenium										BM @ 0.005
Zinc										0.02

[a] Water from polyethylene container with metal spigot, used for steam cleaning of equipment.

[b] Non-priority organic quantified.

ND = Not detected.

BM = Below method detection limit.

Blank = Not run.

302643

TABLE CC-24 (Page 3 of 3)

SUMMARY OF QUALITY CONTROL DATA FOR AQUEOUS MATRICES

COMBE FILL SOUTH LANDFILL

PARAMETER	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	POTABLE WATER[a]
DATE SAMPLED	8/29/85	9/4/85	9/4/85	9/5/85	9/5/85	9/25/85	9/25/85	10/17/85	10/17/85	8/28/85
MISCELLANEOUS, ppb										
Cyanides										ND
Phenols										ND
TENTATIVELY IDENTIFIED VOLATILES, ppb										NF
TENTATIVELY IDENTIFIED ACIDS, ppb										
Unknown(s)										6.1,8.5
Alcohol										6.2
2-Bromo-1,3-cyclopentandione										16.2
TENTATIVELY IDENTIFIED BASE/NEUTRALS, ppb										
Unknown(s)										5.7,9,6.8,22, 9.6,4.6,8.3, 7.1,6,6.1,6.9, 7.4,7.3
Methylbenzene (toluene)										41.5
Dioctylesterhexanedioic acid										78.3

[a]Water from polyethylene container with metal spigot, used for steam cleaning of equipment.

ND = Not detected.

Blank = Not run.

NF = None found.

302644

TABLE CC-25 (Page 1 of 3)

SUMMARY OF QUALITY CONTROL DATA FOR SEDIMENTS/SOILS

Combe Fill South Landfill

PARAMETERS	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK
DATE SAMPLED	11/15/84	11/15/84	11/21/84	11/21/84	11/27/84	11/27/84
VOLATILES, ppb						
Benzene	ND	BM @ 10	ND	ND	ND	ND
Chloroform	BM @ 10	BM @ 10	BM @ 10	22	BM @ 10	BM @ 10
Ethyl benzene	ND	ND	BM @ 10	ND	ND	ND
Methylene Chloride	95	87	36	29	ND	ND
Tetrachloroethylene	BM @ 10	ND	BM @ 10	ND		BM @ 10
Toluene	BM @ 10	ND	BM @ 10	BM @ 10	BM @ 10	BM @ 10
1,1,1-Trichloroethane	ND	ND	BM @ 10	ND	ND	ND
Trichloroethylene	ND	ND	ND	ND	ND	BM @ 10
TENTATIVELY IDENTIFIED VOLATILES, ppb			NF		NF	NF
Unknown(s)	21	-		-		
Methoxy cyclo-butane	-	280		-		
2-Chloro-1,1-difluoro-ethylene	-	97		-		
Arsenous Acrid, tris (trimethylsilyl) erter				22		

ND = Not detected.
BM = Below method detection limit.
NF = None found.
\- = Not found

302645

TABLE CC-25 (Page 2 of 3)

SUMMARY OF QUALITY CONTROL DATA FOR SEDIMENTS/SOILS

Combe Fill South Landfill

PARAMETERS	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK[a]	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK
DATE SAMPLED	8/13/85	8/13/85	8/20/85	8/20/85	8/21/85	8/21/85	8/22/85	8/22/85	8/23/85	8/23/85	8/27/85	8/27/85
VOLATILES, ppb												
Acetone[b]	ND	260[c]	ND	ND	12	43		25	ND	ND	ND	6000[c]
Methylene chloride	ND	50[c]	3[c]	9[c]	3[c,d]	11[c,d]		17[c]	ND	14[c]	94[c]	24000[c]
2-Methyl-2-pentanone[b]	21	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND
Tetrachloroethylene	ND	ND	3[d]	15	ND	ND		ND	4[d]	4[d]	5[c]	ND
ACIDS/PHENOLICS, ppb	ND	ND										
BASE/NEUTRALS, ppb												
Bis(2-ethylhexyl) phthalate	64	ND										
PESTICIDES/PCBs, ppb	ND	ND										
METALS, ppm												
Arsenic	4.8	ND										
Cadmium	19	19										
Chromium	20	10										
Copper	5.8	ND										
Nickel	9.5	ND										
Zinc	25[e]	35[e]										
MISCELLANEOUS, ppb												
Cyanides	ND	ND										
Phenols	ND	ND										
TENTATIVELY IDENTIFIED VOLATILES, ppb												
Unknown(s)	-	8	9	8	8,25	7,25		10,25	16	10	15	2900,2080
Trimethyl silanol	10	9	-	-	-	13		-	-	-	-	3750
Trichlorofluoromethane	-	-	-	-	-	-		-	-	-	-	3750

[a]No trip blank taken this day.
[b]Non-priority organic quantified.
[c]Found in method blank.
[d]Estimated value. Value is below method detection limit.
[e]Value is estimated because of interferences.
Blank = Not run.
- = Not found.
ND = Not detected.

TABLE CC-25 (Page 3 of 3)

SUMMARY OF QUALITY CONTROL DATA FOR SEDIMENTS/SOILS

Combe Fill South Landfill

PARAMETERS	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK[a]	FIELD BLANK	TRIP BLANK	FIELD BLANK	TRIP BLANK	FIELD BLANK
DATE SAMPLED	8/13/85	8/13/85	8/20/85	8/20/85	8/21/85	8/21/85	8/22/85	8/22/85	8/23/85	8/23/85	8/27/85	8/27/85
TENTATIVELY IDENTIFIED ACIDS/BASE/NEUTRALS, ppb												
Unknown(s)	1158,3352, 3718,1707, 9387	686,2851, 1795,8131										
4-Hydroxy-4-methyl-2-pentanone	-	3274										
NON-PRIORITY METALS, ppm												
Aluminum	347	390										
Barium	10	10										
Calcium	227	545										
Cobalt	ND	ND										
Iron	275	213										
Magnesium	161[b]	220[b]										
Potassium	693	718										
Sodium	26500	2260										
Tin	41	59										
Vanadium	17[b]	16[b]										
CONVENTIONALS												
pH (Units)	7.43	8.15	7.26	7.56	6.95	7.05		6.97	7.08	7.12	7.04	7.24

[a]No trip blank taken this day.
[b]Value is estimated because of interferences.
Blank = Not run.
- = Not found.

302647

TABLE CC-26 (Page 1 of 2)

SUMMARY OF QUALITY CONTROL DATA FOR AIR QUALITY SAMPLES

Combe Fill South Landfill

PARAMETER	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	FILTER[a] BLANK
DATE SAMPLED	7/24/84	9/17/85	9/18/85	9/19/85	
VOLATILES[b], μg/tube					
Ethylbenzene	ND	0.110	ND		
Methylene chloride	BM @ 0.05	ND	ND		
Tetrachloroethylene	ND	ND	0.050		
Toluene	BM @ 0.05	0.350	0.170		
Total xylenes[c]		0.500	ND		
ACID/PHENOLICS[d], μg/filter		ND	ND	ND	ND
BASE/NEUTRALS[d], μg/filter					
Bis(2-ethylhexyl) phthalate		11[e]	18[e]	55	98
Diethyl phthalate		95	35	19	ND
Di-n-butyl phthalate		16[e]	10[e]	ND	ND
Di-n-octyl phthalate		ND	ND	ND	10[e]
PESTICIDES/PCBs[d], μg/filter		ND	ND	ND	ND
METALS[d], μg/filter					
Beryllium		4.8	5.6	3.8	3.2
Cadmium		7.4	5.3	11	5.6
Chromium		12	13	9.6	28
Copper		7.3	10	23	ND
Lead		12	15	17	9.2
Nickel		9.4	6.7	21	ND
Zinc		19900	19000	13700	14600
MISCELLANEOUS[d], μg/filter					
Cyanides		ND	ND	ND	ND

[a]Filter blank data reported because of likely contamination of filters with metals.
[b]Tenax or charcoal tube analyzed. For 7/24/85 units are μg of constituent.
[c]Non-priority organic quantified.
[d]Analysis of filter.
[e]Estimated value. Value is below method detection limit.
ND = Not detected.
BM = Below method detection limit.

TABLE CC-26 (Page 2 of 2)

SUMMARY OF QUALITY CONTROL DATA FOR AIR QUALITY SAMPLES

Combe Fill South Landfill

PARAMETER	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	FILTER BLANK[a]
DATE SAMPLED	7/24/84	9/17/85	9/18/85	9/19/85	
TENTATIVELY IDENTIFIED VOLATILES[b], μg/tube					
Unknown(s)		38.5, 0.0786, 0.3357, 0.0644, 0.0682, 0.1288, 0.0806, 0.0847	13.25, 0.1369, 0.4107, 0.1548, 0.1857, 0.1726, 0.2738, 0.0964, 0.1667, 0.2321, 0.125, 0.0567, 0.0667, 0.1429, 0.2429		
2-Butene		1.0	-		
Dimethyloxydimethyl-silane		0.1629	-		
TENTATIVELY IDENTIFIED ACIDS/BASE/NEUTRALS[c], μg/filter					
Unknown(s)		15, 139, 60 55, 23, 82, 493	35, 293, 293, 602, 16	15, 43, 206, 19, 16, 9, 7, 16	84, 333, 28
4-Hydroxy-4-methyl-2-pentanone		336	-	-	-
2-Butoxy methanol		40	-	-	-
3-Methyl octane		-	145	-	-
(1-Methylethyl) benzene		-	20	47	19
4-Methyl-(2)-2-pentene		-	-	-	69
NON-PRIORITY METAL[c], μg/filter					
Aluminum		14500	13000	9200	10300
Barium		27800	26200	18500	19500
Calcium		9350	9020	6620	7020
Cobalt		9.2	14	ND	ND
Iron		306	298	537	607
Magnesium		970	840	753	2500
Manganese		12	11	21	11
Potassium		16900	15700	11400	11900
Sodium		53500	50700	36400	37300
Tin		ND	ND	ND	ND
Vanadium		ND	ND	ND	ND

[a]Filter blank data reported because of likely contamination of filters with metals.
[b]Tenax or charcoal tube analyzed. For 7/24/85 units are μg of constituent.
[c]Analysis of filter.
- = Not found.

302649

APPENDIX DD

PUBLIC HEALTH ASSESSMENT WORKSHEETS

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p.1 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)			
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/	
Chloroform	31	0-0.209	0.209		0-0.011	0		0-5.995	0		—	—	—	L
Trichloro-fluoromethane	159	0-0.187	0		0-0.143	0		—	—		—	—	—	
1,1,1-Trichloro-ethane	152	0-0.0244	0		—	—		—	—		—	—	—	
Methylene Chloride	8.8	0-0.415	0.17607		0-.378	0.00033		0-.3864	0.1138		0-0.0043	0		L
2-4 Dimethyl-phenol	—	0-0.00312	0		0-0.071	0	—	—	—					

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

Groundwater includes deep, shallow and residential wells. Surface water includes leachate seeps. Ranges include previous and RI data

Groundwater: Representative is well D-2; range includes all RI and previous monitoring and potable well data

Surface water: Representative is RI station W-6 minus RI station W-7 (background). Range is all RI and previous data from surface waters and leachate minus RI background station W-7.

Soil: Representative = RI Field A average minus RI Field C average (background); Range is all RI and previous data for test pits, hand augered soil samples, soil boring & rock corings, leachate and surface water sediment/soil samples minus RI Field C average.

302651

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p 2 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Ground Water Repres a/	Ground Water Ref b/	Surface Water (mg/l) Range	Surface Water Repres a/	Surface Water Ref b/	Soil (mg/kg) Range c/	Soil Repres c/	Soil Ref b/	Air (mg/m3) Range	Air Repres	Air Ref b/	
1,1-Dichloro-ethane	30	0-0.0652	0.00641		0-0.160	0		—	—	—	—	—	—	L
Trichloro-ethane	56	—	—	—	—	—	—	—	—	—	—	—	—	L
Benzene	83	0-0.352	0		0-0.141	0		—	—	—	0-0.144	0		
Chloroethane	—	0-0.0743	0		0-0.0153	0		—	—	—	—	—	—	
Dichlorodifluoro-methane	58	0-0.0237	0.0237		0-0.549	0		—	—	—	—	—	—	L

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS (Cont.)

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

Air: Representative = RI downwind average minus RI upwind average (background)
Range = RI site data minus RI upwind data (background).

302652

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 3 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Repres a/	Ref b/	Surface Water (mg/l) Range	Repres a/	Ref b/	Soil (mg/kg) Range c/	Repres c/	Ref b/	Air (mg/m3) Range	Repres	Ref b/	
Toluene	300	0-1.37	0		0-1.51	0		0-2.995	0		0-0.200	0.0067		
Trans 1,2-Dichloroethene	59	0-0.0475	0		0-0.120	0		—	—	—	—	—	—	
1,2 Dichloroethane	14	0-0.0405	0.00798		0-0.012	0		—	—	—	—	—	—	L
Carbon Tetrachloride	110	0-0.338	0		0-0.184	0		—	—	—	—	—	—	
Chlorobenzene	330	0-0.0303	0		0-0.052	0		—	—	—	—	—	—	

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302653

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 4 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)			
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/	
1,2-Dichloropropane	51	—	—	—	0-0.014	0		—	—	—	—	—	—	L
Ethylbenzene	1100	0-0.010	0		0-0.265	0		0-0.069	0		0-0.270	0.001		
Tetrachloroethylene	364	0-0.100	0.0143		0-0.023	0		0-1.395	0		0-0.003	0.004		
Trichloroethylene	126	0.0568	0.00834		0-0.016	0		—	—	—	0-0.0017	0		
Bromodichloromethane	—	—	—	—	0-0.028	0		—	—	—	—	—	—	

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).

2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.

3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).

4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302654

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 5 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Ground Water (mg/l) Repres a/	Ground Water (mg/l) Ref b/	Surface Water (mg/l) Range	Surface Water (mg/l) Repres a/	Surface Water (mg/l) Ref b/	Soil (mg/kg) Range c/	Soil (mg/kg) Repres c/	Soil (mg/kg) Ref b/	Air (mg/m3) Range	Air (mg/m3) Repres	Air (mg/m3) Ref b/	
Pentachloro-phenol	53000	0-0.154	0		—	—	—	0-0.150	0.030		—	—	—	H
Phenol	14.2	0-0.018	0.00235		0-0.00685	0.00685		—	—	—	—	—	—	L
Dinbutyl-phthalate	170000	0	0		0	0		0-6.0	0.032		0-0.000006	0		H
Bis(2-ethylhexyl) phthalate	—	0	0		0-0.090	0		0-17.115	0.771		0	0		
Diethyl-phthalate	14.2	0-0.0102	0		0-0.054	0		—			0-0.00001	0.0000013		

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302655

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p 6 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Ground Water (mg/l) Repres a/	Ground Water (mg/l) Ref b/	Surface Water (mg/l) Range	Surface Water (mg/l) Repres a/	Surface Water (mg/l) Ref b/	Soil (mg/kg) Range c/	Soil (mg/kg) Repres c/	Soil (mg/kg) Ref b/	Air (mg/m3) Range	Air (mg/m3) Repres	Air (mg/m3) Ref b/	
1,4 Dichloro-benzene	1700	0-0.0394	0		0-0.0191	0		—	—	—	—	—	—	
Isophorone	—	0-0.0219	0.0219		0	0	—	—	—	—	—	—	—	
1,2 Dichloro-benzene	1700	0-0.00977	0		0-0.074	0		—	—	—	—	—	—	
Benzo (a) pyrene	5500000	—	—	—	—	—	—	0-0.950	0.062		—	—	—	H
Dioctyl phthalate	—	—	—	—	—	—	—	0-0.210	0.030		—	—	—	

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 7 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Repres a/	Ref b/	Surface Water (mg/l) Range	Repres a/	Ref b/	Soil (mg/kg) Range c/	Repres c/	Ref b/	Air (mg/m3) Range	Repres	Ref b/	
Butylbenzyl phthalate	—	—	—	—	0-0.060	0	—	0-68.0	0		—	—	—	
Benzo(b) fluoranthene	550000	—	—	—	—	—	—	0-0.670	0		—	—	—	H
Benzo(ghi) perylene	1600000	—	—	—	—	—	—	0-0.360	0		—	—	—	H
Fluoranthene	38000	—	—	—	—	—	—	0-1.2	0		—	—	—	H
Indeno(123cd) pyrene	1600000	—	—	—	—	—	—	0-0.40	0		—	—	—	H

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).

2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.

3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).

4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302657

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 8 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)		
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/
Phenanthrene	14000	—	—	—	—	—	—	0-0.990	0		—	—	—
Pyrene	38000	—	—	—	—	—	—	0-0.796			—	—	—
Acenaphthene	4600	—	—	—	—	—	—	—			—	—	—
α Endosulfan	—	—	—	—	0-0.001	0		—	—	—	—	—	—
4,4'-DDE	440000	—	—	—	—	—	—	0-0.011	0.0022		—	—	— H

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302658

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p.4 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Ground Water Repres a/	Ground Water Ref b/	Surface Water (mg/l) Range	Surface Water Repres a/	Surface Water Ref b/	Soil (mg/kg) Range c/	Soil Repres c/	Soil Ref b/	Air (mg/m3) Range	Air Repres	Air Ref b/	
4,4' DDT	243000	—	—	—	—	—	—	0-0.017	0.0034		—	—	—	H
Aldrin	96000	—	—	—	—	—	—	0-0.132	0		—	—	—	H
Dieldrin	1700	—	—	—	—	—	—	0.076	0		—	—	—	
Delta-BHC	6600	—	—	—	—	—	—	—	—		—	—	—	
Antimony	—	0-0.03	0	—	0	0		0-10	0		0-0.000069	0.00034		

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 10 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

		Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)		
Chemical (CAS No.)	Koc Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/
Arsenic	—	0-0.02	0		0-0.01	0		0-89.15	10.2		—	—	—
Berylium	—	0-0.0005	0		0-0.026	0		0-1.0	0.92		0	0	
Cadmium	—	0-0.22	0		0-0.021	0		0-10.95	1.21		0-0.000004	0	
Chromium	—	0-0.03	0		0-0.13	0		0-16.45	31.65		0-0.000256	0	
Copper	—	0-1.4	0.007		0-0.14	0		0-109	32.8		0-0.000259	0	

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 11 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)		
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/
LEAD	—	0-2.25	0		0-0.33	0		0-56.55	10.35		0-0.000159	0.000014	-
MERCURY	—	0-0.006	0.0002		0-0.001	0		0-0.35	0		—	—	—
NICKEL	—	0-0.03	0		0-0.19	0		0-70.5	16.0		0-0.000017	0.000024	--
SELENIUM	—	0-0.02	0		0-0.008	0		0-3.8	0		—	—	—
SILVER	—	0-0.004	0		0-0.006	0		0-41	0		—	—	—

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302661

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p.12 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)		
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/
Thallium	—	0	0		0-0.012	0		0-5.1	2.64		—	—	—
Zinc	—	0-4.0	0.03		0-2.6	0.05		0-291.5	16.7		0	0	—
Phenols	—	0–0.428	0		0-0.418	0		0-1.2	0		—	—	—
Cyanides	—	0-0.120	0.0295		0-0.070	0		—	—	—	—	—	—
Gross α-(pCi/l)	—	0-1.3±7.8	0		0-40.9±11	0		—	—	—	—	—	—

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302662

COMBL FILL SOUTH LANDFILL
WORKSHEET 3-1 p. 13 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES
IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)		
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/
Gross β	–	0–13±2.0	2.5±1.6	–	1.18–243±17	0		–	–	–	–	–	–
1,1-Dichloroethylene		0–0.00641	0										
Chrysene	300,000	–	–	–	–	–	–	0–0.990	0	–	–	–	–
Heptane	–	–	–	–	0–0.000021	0	–	–	–	–	–	–	–
Propylbenzene	–	–	–	–	0–0.000011	0	–	–	–	–	–	–	–

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).

2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.

3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).

4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p 14 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)		
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/
3-flouro-2-propynenitrile	—	—	—		—	—	—	0–2.6	0		—	—	—
1,3-Dichlorocyclo butane	—	—	—		—	—	—	0-5.1	0		—	—	—
1-flouro4methoxy benzene	—	—	—		—	—	—	0-3.0	0		—	—	—
2 Chloro-1,1-difluoroethylene	—	—	—		—	—	—	—	—		—	—	—
2-methyl naphthalene	—	—	—		—	—	—	0-0.180	—	—	—	—	—

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
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c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p.15 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical	Koc	Ground Water (mg/l)			Surface Water (mg/l)			Soil (mg/kg)			Air (mg/m3)		
(CAS No.)	Value	Range	Repres a/	Ref b/	Range	Repres a/	Ref b/	Range c/	Repres c/	Ref b/	Range	Repres	Ref b/
dichlorofluoromethane	—	0-0.128	0		—	—	—	—	—	—	—	—	—
2-bromo-1,3-cyclopentanedione	—	—	—		—	—	—	—	—	—	—	—	—
2-fluorophenol	—	—	—	—	—	—	—	0-4.362	0		—	—	—
1,4-dichlorobutane	—	—	—	—	0-0.010	0		—	—	—	—	—	—
1,1,2-trichloro-1,2,2-trifluoroethane	—	—	—		—	—	—	0-68.0	0		—	—	—

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Ground Water Repres a/	Ground Water Ref b/	Surface Water (mg/l) Range	Surface Water Repres a/	Surface Water Ref b/	Soil (mg/kg) Range c/	Soil Repres c/	Soil Ref b/	Air (mg/m3) Range	Air Repres	Air Ref b/
4-Methyl-2-pentanone	—	—	—	—	—	—	—	0-0.028	0		—	—	—
3,3,3-trichloro-1-propene	—	0-0.0135	0		0-0.012	0		—	—	—	—	—	—
1-chloro-2-propanol	—	—	—	—	0-0.074	0		—	—	—	0-0.000039	0.000012	
tetrahydro-2(iodomethyl)-6-methoxy-2H-pyran-4-ol				—	—	—	—	0-8.4	0	—	—	—	—
tetrachloroethane	118	0-0.005	0		—	—	—	—	—	—	—	—	—

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.

b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.

c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).

2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.

3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).

4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302666

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-1 p. 17 of 18

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Repres a/	Ref b/	Surface Water (mg/l) Range	Repres a/	Ref b/	Soil (mg/kg) Range c/	Repres c/	Ref b/	Air (mg/m3) Range	Repres	Ref b/
Dichlorobenzine		0–0.108	0		—	—	—	—	—	—	—	—	—
Naphthalene		0–0.00324	0		0-0.0177	0		0–0.084	0				
Cis-2-bromocyclo hexanol	—	0–0.00894	0		—	—	—	—	—	—	—	—	—
fluorobiphenol	—	0–0.01403	0		—	—	—	—	—	—	—	—	—
4-chloro-2-methyl-benzenamine	—	0–0.009	0		—	—	—	—	—	—	—	—	—

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).
2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.
3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).
4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

302667

SCORING FOR INDICATOR CHEMICAL SELECTION: CONCENTRATIONS AND Koc VALUES
IN VARIOUS ENVIRONMENTAL MEDIA

Chemical (CAS No.)	Koc Value	Ground Water (mg/l) Range	Ground Water Repres a/	Ground Water Ref b/	Surface Water (mg/l) Range	Surface Water Repres a/	Surface Water Ref b/	Soil (mg/kg) Range c/	Soil Repres c/	Soil Ref b/	Air (mg/m3) Range	Air Repres	Air Ref b/
1-1'-byphenyl fluro		–	–	–	0-0.000036	0	–	–	–	–	–	–	–
1,5 Dibromopentane		–	–	–	0-0.0000457	0	–	–	–	–	–	–	–
1-chloro-2 nitrobenzene		–	–	–	0-0.000017	0	–	–	–	–	–	–	–
4-fluro-1,1'-byphenyl		0-0.008206	0	–	–	–	–	–	–	–	–	–	–

a/ Mean of reported values used as representative concentration for surface and ground water; zero used for all values reported as below detection limit.
b/ A = Feasibility Study document, B = Remedial Investigation document. Page numbers follow document designation.
c/ Soil concentration range is across surface, subsurface soils, and sediments; mean of the surface soil values used as representative concentration; zero used for all values reported as below detection limit.

INSTRUCTIONS

1. Write down each chemical found at the site with its CAS Number and Koc value (see Appendix C).

2. If more than 20 chemicals are listed, identify those with the ten highest Koc values with an H and those with the ten lowest Koc values with an L.

3. Indicate the range of concentrations for each chemical in each medium and the source of the information (e.g., RI report).

4. Determine a "representative" concentration and enter it; indicate in footnotes the basis of the representative value.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet; also indicate any concerns about the monitoring data:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p1. of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w_T b/	s_T b/	a_T b/
chloroform	PC	B2	5.71×10^{-2}	2.86×10^{-6}	5.71×10^{-1}
	NC	—	—	—	—
trichlorofluoromethane	NC	—	—	—	—
1,1,1-trichloroethane	NC	2	7.33×10^{-4}	3.67×10^{-8}	7.33×10^{-3}
methylene chloride	PC	B2	—	—	—

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

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COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p.2 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	$_{w}T$ b/	$_{s}T$ b/	$_{a}T$ b/
Methylene Chloride	NC	10	9.20×10^{-4}	4.60×10^{-8}	9.20×10^{-3}
1,1-Dichloroethane	NC	7	2.58×10^{-2}	1.29×10^{-6}	2.58×10^{-1}
Trichloroethane	PC	C	8.57×10^{-3}	4.29×10^{-7}	8.57×10^{-2}
	NC	—	—	—	—
Benzene	PC	A	7.43×10^{-3}	3.71×10^{-7}	7.43×10^{-2}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302670

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 3 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
benzene	NC	$5^{w,s}/10^{air}$	1.17×10^{-1}	5.85×10^{-6}	1.18×10^{-2}
chloroethane	—	—	—	—	—
dichlorodifluoromethane	NC	—	—	—	—
toluene	NC	7	5.25×10^{-3}	2.66×10^{-7}	5.20×10^{-2}
trans-1,2-dichloroethylene	NC	5	5.34×10^{-2}	2.65×10^{-6}	5.39×10^{-1}
2,4-dimethyl phenol	—	—	—	—	—

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302671

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 4 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w/T b/	s/T b/	a/T b/
1,2-Dichloroethane	PC	B2	6.57×10^{-3}	3.29×10^{-7}	6.57×10^{-2}
	NC	$10^{w,s}/8^{air}$	1.76×10^{-2}	8.80×10^{-7}	1.10×10^{0}
Carbon Tetrachloride	PC	B2	1.11×10^{0}	5.57×10^{-5}	1.11×10^{1}
	NC	10	3.17×10^{-1}	1.59×10^{-5}	3.17×10^{0}
Chlorobenzene	NC	$4^{w,s}/1^{air}$	1.43×10^{-1}	7.14×10^{-6}	2.79×10^{-1}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302672

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 5 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
1,2-Dichloropropane	NC	10	1.00×10^{-1}	5.00×10^{-6}	1.00×10^{0}
Ethyl Benzene	NC	4	1.10×10^{-2}	5.57×10^{-7}	1.10×10^{-1}
Tetrachloroethylene	PC	B2	5.14×10^{-3}	2.57×10^{-7}	5.14×10^{-2}
	NC	$7^{w,s}/10^{air}$	9.62×10^{-3}	4.81×10^{-7}	2.75×10^{-2}
Trichloroethylene	PC	B2	5.14×10^{-3}	2.57×10^{-7}	5.14×10^{-2}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302673

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 6 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	T_w b/	T_s b/	T_a b/
Trichloroethylene	NC	5 w,s / 4 air	1.05×10^{0}	5.36×10^{-5}	2.96×10^{1}
Bromodichloromethane	—	—	—	—	—
Pentachlorophenol	NC	—	—	—	—
Phenol	NC	—	—	—	—
Dibutyl phthalate	NC	8	3.81×10^{-7}	1.90×10^{-6}	3.31×10^{-1}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302674

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 7 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
Bis (2-ethylhexyl) phthalate	—	—	—	—	—
Diethyl phthalate	NC	4	2.67×10^{-4}	1.34×10^{-8}	2.67×10^{-3}
1,4-Dichlorobenzene	NC	$4^{w,s}/5^{air}$	5.19×10^{-2}	2.60×10^{-6}	3.61×10^{-1}
Isophorone	—	—	—	—	—
1,2-Dichlorobenzene	NC	$4^{w,s}/5^{air}$	5.19×10^{-2}	2.60×10^{-6}	3.61×10^{-1}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302675

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 8 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	T_w b/	T_s b/	T_a b/
Benzo (a) pyrene	PC	B2	1.43×10^{1}	7.14×10^{-4}	1.43×10^{2}
	NC	8 w,s / 6 air	2.67×10^{1}	1.33×10^{-3}	1.91×10^{1}
Diactyl phthalate	—	—	—	—	—
Butylbenzyl phthalate	—	—	—	—	—
Benzo (b) fluoranthene	PC	B2	4.29×10^{0}	2.14×10^{-4}	4.29×10^{1}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302676

COMBE FILL SOUTH LANDFILL
WORKSHEET 3-2 p. 9 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
Benzo(b)fluoranthene	NC	--	--	--	--
Benzo(ghi)perylene	PC	--	--	--	--
	NC	--	--	--	--
Fluoranthene	PC	--	--	--	--
	NC	--	--	--	--

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302677

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p.10 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
Indeno(1,2,3-cd)pyrene	PC	C	—	—	—
	NC	—	—	—	—
Phenanthrene	PC	D	—	—	—
	NC	—	—	—	—
Pyrene	PC	—	—	—	—

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302678

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p.11 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w_T b/	s_T b/	a_T b/
Pyrene	NC	—	—	—	—
Acenapthene	PC + NC	—	—	—	—
Naphthalene	—	—	—	—	—
α-Endosulfan	—	—	—	—	—
Chrysene	PC	—	1.43×10^{-1}	7.14×10^{-6}	1.43×10^{0}
	NC	—	—	—	—
4,4'-DDE *	PC	B2	1.09×10^{-1}		

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302679

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p.12 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	T_w b/	T_s b/	T_a b/
4,4'-DDE	NC	—	—	—	—
4,4'-DDT	PC	B2	1.60×10^{-1}	8.00×10^{-6}	1.60×10^{0}
	NC	—	—	—	—
Aldrin	PC	B2			
	NC	6	3.39×10^{0}	1.69×10^{-4}	3.39×10^{1}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302680

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 13 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	T_w b/	T_s b/	T_a b/
Dieldrin	PC	B2	3.71×10^0	1.86×10^{-4}	3.71×10^1
	NC	—	—	—	—
Delta BHC	PC	D	—	—	—
	NC	—	—	—	—
Antimony	NC	10 w,s/8 air	4.35×10^0	2.17×10^{-4}	2.29×10^2

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302681

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p.14 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w_T b/	s_T b/	a_T b/
Arsenic	PC	A	3.71×10^0	1.86×10^{-4}	3.71×10^1
	NC	9	1.80×10^1	9.00×10^{-4}	1.80×10^2
Berylium	PC	$D^{w,s}/B2^{air}$	NA	NA	4.86×10^6
	NC	$—^{w,s}/8^{air}$	—	—	1.45×10^4
Cadmium	PC	$D^{w,s}/B1^{air}$	NA	NA	1.71×10^1

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302682

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 15 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
Cadmium	NC	$10^{w,s}/8^{air}$	4.45×10^{0}	2.23×10^{-4}	3.59×10^{2}
Chromium (+3)	NC	—	—	—	—
(+6)	PC	$D^{w,s}/A^{air}$	NA	NA	5.43×10^{-1}
(+6)	NC	$-^{w,s}/8^{air}$	—	—	2.50×10^{1}
Copper	NC	5	7.14×10^{-1}	3.57×10^{-5}	7.14×10^{0}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302683

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 16 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	T_w b/	T_s b/	T_a b/
Lead	NC	10	8.93×10^{-1}	4.46×10^{-5}	8.93×10^{0}
Mercury	NC	$7^{w,s}/8^{air}$	1.84×10^{1}	9.21×10^{-4}	1.84×10^{2}
Nickel	PC	$D^{w,s}/A^{air}$	NA	NA	3.14×10^{-1}
	NC	10	4.26×10^{0}	2.13×10^{-4}	1.57×10^{2}
Selenium	NC	10	1.05×10^{2}	5.26×10^{-3}	1.05×10^{3}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302684

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 17 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	T_w b/	T_s b/	T_a b/
Silver	NC	1	2.00×10^{1}	1.00×10^{-3}	2.00×10^{2}
Thallium	NC	—	—	—	—
Zinc	NC	8	1.07×10^{-1}	5.33×10^{-6}	1.07×10^{0}
Phenols	NC	$3^{w,s}/10^{air}$	1.00×10^{-1}	5.02×10^{-6}	2.49×10^{0}
Cyanides	NC	—	—	—	—

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302685

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 18 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
Xylenes	NC	—	—	—	—
Nonane	—	—	—	—	—
Acetone	NC	—	—	—	—
2-Butanone	—	—	—	—	—
4-Methyl-2-pentanone	—	—	—	—	—
2-Methyl naphthalene	—	—	—	—	—

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302686

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2

p. 19 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
3,3,3-Trichloro-1-propene	—	—	—	—	—
1-chloro-2-propanol	—	—	—	—	—
Tetrachloroethane	PC	C	4.86×10^{-2}	2.43×10^{-6}	4.86×10^{-1}
	NC	5	4.55×10^{-1}	2.27×10^{-5}	4.55×10^{0}

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.

b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302687

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 20 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	T_w b/	T_s b/	T_a b/
Dichlorobenzene	NC	$4^{w,s}/5^{air}$	5.19×10^{-2}	2.60×10^{-4}	3.61×10^{-1}
cis-2-Bromocyclohexanol	–	–	–	–	–
Fluorobiphenol	–	–	–	–	–
4-Chloro-2-methyl benzenamine	–	–	–	–	–
Dichlorofluoromethane	–	–	–	–	–

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302688

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p.21 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
2-Bromo-1,3-cyclopentanedione	—	—	—	—	—
2-Fluorophenol	—	—	—	—	—
1,4-Dichlorobutane	—	—	—	—	—
1,1,2-Trichloro-1,2,2-trifluoroethane	—	—	—	—	—
3-Fluoro-2-propynenitrile	—	—	—	—	—

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.

2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.

3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302689

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-2 p. 22 of 22

SCORING FOR INDICATOR CHEMICAL SELECTION:
TOXICITY INFORMATION

Chemical	Toxicologic Class	Rating Value/EPA Category a/	w b/ T	s b/ T	a b/ T
1,3-dichlorocyclobutane	—	—	—	—	—
1-fluoro-4-methoxybenzene	—	—	—	—	—
2-chloro-1,1-difluoroethylene	—	—	—	—	—
heptane	—	—	—	—	—
propyl benzene	—	—	—	—	—

a/ Rating value is for severity of effect for noncarcinogens, range in 1(low) to 10(high); EPA category is a qualitative weight-of-evidence designation for potential carcinogens; explanation of the categories is presented in Exhibit D-2, Appendix D. Information taken from Appendix C.
b/ Data taken from Appendix C.

INSTRUCTIONS

1. Record compounds from Worksheet 3-1, then refer to Appendix C and note whether they are classed as PC or NC or both.
2. Record the rating value or EPA category for each compound in each class (see Appendix C). If there are route-specific differences, record both values.
3. Record the T values from Appendix C.

ASSUMPTIONS

List all the major assumptions made in developing the data for this worksheet:

302690

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-3 p 1 of 4

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR CARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Chloroform	0.012	0.012	6.28×10^{-4}	—	1.71×10^{-5}	—	—	—	0.0120	0.012	4	1 (B2)
Benzene	1.87×10^{-3}	—	1.05×10^{-3}	—	—	—	0.0107	—	0.0126	—	3	(A)
1,2-Dichloroethane	2.66×10^{-4}	5.24×10^{-5}	7.88×10^{-5}	—	—	—	—	—	2.66×10^{-4}	5.24×10^{-5}	8	4 (B2)

INSTRUCTIONS

1. List all of the chemicals to be considered as potential carcinogens.

2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate a CT based on both the maximum and representative concentration for all media in which the chemical was detected.

3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.

4. Rank the compounds based on both their maximum and representative IS values. Also, enter their EPA weight-of-evidence category in parentheses next to their rank.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302691

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-3 p. 2 of 4

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR CARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Carbon Tetrachloride	0.375	—	0.304	—	—	—	—	—	0.375	—	1	(B2)
Tetrachloroethylene	5.14×10^{-4}	7.35×10^{-5}	1.18×10^{-4}	—	3.59×10^{-7}	—	1.542×10^{-4}	2.056×10^{-4}	6.686×10^{-4}	2.791×10^{-4}	6	3 (B2)
Trichloroethylene	2.92×10^{-4}	4.287×10^{-5}	8.724×10^{-5}	—	—	—	8.735×10^{-5}	—	3.794×10^{-4}	4.237×10^{-5}	7	6 (B2)
Benzo(a)pyrene	—	—	—	—	6.783×10^{-4}	4.427×10^{-5}	—	—	6.783×10^{-4}	4.427×10^{-5}	5	5 (B2)
Benzo(b)fluoranthene	—	—	—	—	1.434×10^{-4}	—	—	—	1.434×10^{-4}	—	9	(B2)

INSTRUCTIONS

1. List all of the chemicals to be considered as potential carcinogens.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate a CT based on both the maximum and representative concentration for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values. Also, enter their EPA weight-of-evidence category in parentheses next to their rank.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302692

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-3 p 3 of 4

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR CARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Arsenic	0.0742	—	0.0371	—	0.0166	0.00190	—	—	0.0908	0.00190	2	2 (A)
Cadmium	—	—	—	—	—	—	6.84×10^{-5}	—	6.84×10^{-5}	—	10	(D/B1)
Nickle	—	—	—	—	—	—	5.338×10^{-6}	7.536×10^{-6}	5.338×10^{-6}	7.536×10^{-4}	13	7 (D/A)
Chyrsene	—	—	—	—	7.069×10^{-6}	—	—	—	7.069×10^{-6}	—	12	

INSTRUCTIONS

1. List all of the chemicals to be considered as potential carcinogens.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate a CT based on both the maximum and representative concentration for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values. Also, enter their EPA weight-of-evidence category in parentheses next to their rank.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302693

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-3 p. 4 of 4

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR CARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
4,4'-DDE	—	—	—	—	5.973×10^{-8}	1.195×10^{-8}	—	—	5.973×10^{-8}	1.195×10^{-8}	15	9 (B2)
4,4'-DDT	—	—	—	—	1.36×10^{-7}	2.72×10^{-8}	—	—	1.36×10^{-7}	2.72×10^{-8}	14	8 (B2)
Dieldrin	—	—	—	—	1.414×10^{-5}	—	—	—	1.414×10^{-5}	—	11	(B2)

INSTRUCTIONS

1. List all of the chemicals to be considered as potential carcinogens.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate a CT based on both the maximum and representative concentration for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values. Also, enter their EPA weight-of-evidence category in parentheses next to their rank.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302694

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p.1of8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
1,1,1-Trichloroethane	1.784×10^{-5}	—	—	—	—	—	—	—	1.789×10^{-5}	—		
Methylene chloride	3.818×10^{-4}	1.620×10^{-4}	2.558×10^{-4}	3.036×10^{-7}	1.777×10^{-7}	5.235×10^{-9}	3.956×10^{-5}	—	4.215×10^{-4}	1.620×10^{-4}		13
1,1-Dichloroethane	1.682×10^{-3}	1.654×10^{-4}	4.128×10^{-3}	—	—	—	—	—	4.128×10^{-3}	1.654×10^{-4}		12
Benzene	0.039	—	0.016	—	—	—	16.992	—	17.024	—	1	

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302695

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p. 2 of 8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Toluene	7.124×10^{-3}	—	7.852×10^{-3}	—	7.787×10^{-7}	—	0.0104	3.484×10^{-4}	0.01825	3.484×10^{-4}	15	9
Trans-1,2-dichloroethylene	2.513×10^{-3}	—	6.348×10^{-3}	—	—	—	—	—	6.348×10^{-3}	—		
1,2-Dichloroethane	7.128×10^{-4}	1.404×10^{-4}	2.112×10^{-4}	—	—	—	—	—	7.128×10^{-4}	1.404×10^{-4}		14
Carbon Tetrachloride	0.1071	—	0.0583	—	—	—	—	—	0.1071	—	13	

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302696

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p. 3 of 8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Chlorobenzene	4.333×10^{-3}	—	7.436×10^{-3}	—	—	—	—	—	7.436×10^{-3}	—		
1,2-Dichloropropane	—	—	1.4×10^{-3}	—	—	—	—	—	1.4×10^{-3}	—		
Ethyl benzene	1.1×10^{-4}	—	2.915×10^{-3}	—	4.968×10^{-9}	—	0.0297	1.1×10^{-4}	0.0326	1.1×10^{-4}	14	15
Tetrachloroethylene	9.62×10^{-4}	1.376×10^{-4}	2.213×10^{-4}	—	6.71×10^{-7}	—	8.25×10^{-5}	1.1×10^{-4}	1.045×10^{-3}	2.476×10^{-4}		11

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p.4 of 8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Trichloroethylene	0.0546	8.757×10^{-3}	0.0168	—	—	—	0.0503	—	0.1100	8.757×10^{-3}	1,2	2
Di-n-butyl phthalate	—	—	—	—	1.14×10^{-5}	6.08×10^{-8}	2.286×10^{-6}	—	1.369×10^{-5}	6.08×10^{-8}		
Diethyl phthalate	2.723×10^{-6}	—	1.442×10^{-5}	—	—	—	2.67×10^{-8}	3.471×10^{-7}	1.445×10^{-5}	3.471×10^{-4}		
1,4-Dichlorobenzene	2.045×10^{-3}	—	9.913×10^{-4}	—	—	—	—	—	2.045×10^{-3}	—		

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302698

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p. 5 of 8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
1,2-Dichlorobenzene	5.071×10^{-4}	—	3.841×10^{-3}	—	—	—	—	—	3.341×10^{-3}	—		
Benzo (a) pyrene	—	—	—	—	1.264×10^{-3}	8.246×10^{-5}	—	—	1.264×10^{-3}	8.246×10^{-5}		
Aldrin	—	—	—	—	2.231×10^{-5}	—	—	—	2.231×10^{-5}	—		
Antimony	0.1305	—	—	—	2.17×10^{-3}	—	0.0158	7.786×10^{-3}	0.1485	7.786×10^{-3}	9	3

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302699

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p. 6 of 8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Arsenic	0.360	—	0.180	—	0.0802	9.18×10^{-3}	—	—	0.4402	9.18×10^{-3}	7	1
Cadmium	0.979	—	0.0735	—	2.442×10^{-3}	2.698×10^{-4}	1.436×10^{-3}	—	0.9829	2.698×10^{-4}	5	10
Copper	0.9996	4.998×10^{-3}	0.09996	—	3.891×10^{-3}	1.171×10^{-3}	1.849×10^{-3}	—	1.005	6.169×10^{-3}	4	5
Lead	2.009	—	0.2947	—	2.522×10^{-3}	4.616×10^{-4}	1.42×10^{-3}	1.250×10^{-4}	2.012	5.866×10^{-4}	3	7

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302700

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p. 7 of 8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Mercury	0.1104	3.68×10^{-3}	0.0184	—	3.224×10^{-4}	—	—	—	0.1107	3.68×10^{-3}	11	6
Nickel	0.1278	—	0.8094	—	0.0150	3.408×10^{-3}	2.669×10^{-3}	3.768×10^{-3}	0.8271	7.176×10^{-3}	6	4
Selenium	2.1	—	0.84	—	0.0200	—	—	—	2.12	—	7	
Silver	0.08	—	0.12	—	0.041	—	—	—	0.161	—	10	

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.

2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.

3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.

4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302701

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-4 p. 8 of 8

SCORING FOR INDICATOR CHEMICAL SELECTION:
CALCULATION OF CT AND IS VALUES FOR NONCARCINOGENIC EFFECTS

Chemical	Ground Water CT		Surface Water CT		Soil CT		Air CT		IS Value		Tentative Rank	
	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres	Max	Repres
Zinc	0.428	3.21×10^{-3}	0.2782	5.35×10^{-3}	1.554×10^{-3}	8.901×10^{-5}	—	—	0.4296	5.439×10^{-3}	8	8

INSTRUCTIONS

1. List all of the chemicals to be considered for noncarcinogenic effects.
2. Calculate concentration times toxicity (CT) values using the information from Worksheets 3-1 and 3-2. Calculate CT values based on both maximum and representative concentrations for all media in which the chemical was detected.
3. Sum the CT values across media, keeping the two types of concentration separate. Use only the highest CT value of ground water and surface water if both were contaminated. Record the sums in the IS column.
4. Rank the compounds based on both their maximum and representative IS values.

ASSUMPTIONS

List all major assumptions made in developing the data for this worksheet:

302702

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-5 p.1 of 7

SCORING FOR INDICATOR CHEMICAL SELECTION: EVALUATION OF EXPOSURE FACTORS AND FINAL CHEMICAL SELECTION

Based on Representative Values

Chemical	IS Values PC	IS Values NC	Ranking PC	Ranking NC	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m3/mole)	Koc	Half-Life (Days) GW	Half-Life (Days) SW	Half-Life (Days) Soil	Half-Life (Days) Air	IC
Chloroform	0.012	—	1	—	8.2×10^3	1.51×10^2	2.87×10^{-3}	31	—	0.3–30	—	80	+
Methylene chloride	—	1.62×10^{-4}	—	13	2×10^4	3.62×10^2	2.03×10^{-3}	8.8	—	1.2–5.8	—	53.2	+
Toluene	—	3.484×10^{-4}	—	9	5.35×10^2	2.81×10^1	6.37×10^{-3}	300	—	0.17	—	1.3	+
1,2-Dichloroethane	5.24×10^{-5}	1.404×10^{4}	4	14	8.52×10^3	6.4×10^1	9.78×10^{-4}	14	—	0.17	—	36–127	+

INSTRUCTIONS

1. List the top 10 to 15 PC and NC based on IS scores, giving their IS values and their ranking.
2. Refer to Appendix C and record each chemical's solubility, vapor pressure, Henry's law constant, Koc, and half-lives in air, water, and soil.
3. Select the final indicator chemicals. Use your judgement -- if a compound has a high water solubility and a long half-life yet is ranked lower than a compound with minimal water solubility and a short half-life, you may wish to move it up in the ranking (refer to Section 3.2 for additional guidance on the final selection).
4. Document any changes in ranking made because of exposure factors.
5. In the last column indicate with a + those chemicals which have been selected as indicator chemicals.

ASSUMPTIONS

List all major assumptions made in the development of data for this worksheet:

Greater weight given to compounds found in groundwater for final selection.
Benzene added to final indicator list although not "representative", but occurs in groundwater upgradient of susceptible private wells.
Arsenic was eliminated as an indicator chemical during second iteration of evaluation.

302703

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-5 p.2 of 7

SCORING FOR INDICATOR CHEMICAL SELECTION:
EVALUATION OF EXPOSURE FACTORS AND FINAL CHEMICAL SELECTION
Based on Representative Values

Chemical	IS Values PC	IS Values NC	Ranking PC	Ranking NC	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m3/mole)	Koc	Half-Life (Days) GW	Half-Life (Days) SW	Half-Life (Days) Soil	Half-Life (Days) Air	IC
tetrachloroethylene	2.791×10^{-4}	2.476×10^{-4}	3	11	1.5×10^{2}	1.78×10^{1}	2.54×10^{-2}	364	—	1-30	—	47	+
trichloroethylene	4.287×10^{-5}	8.757×10^{-3}	6	2	1.1×10^{3}	5.79×10^{1}	9.1×10^{-3}	126	—	1-90	—	3.7	+
benzo(a)pyrene	4.427×10^{-5}	8.246×10^{-5}	5	—	1.2×10^{-3}	5.6×10^{-9}	1.55×10^{-6}	55×10^{6}	—	0.4	420-480	1-6	— a
arsenic	0.0019	9.18×10^{-3}	2	1	—	0.0	—	—	—	Persistent	—	5	+

INSTRUCTIONS

1. List the top 10 to 15 PC and NC based on IS scores, giving their IS values and their ranking.
2. Refer to Appendix C and record each chemical's solubility, vapor pressure, Henry's law constant, Koc, and half-lives in air, water, and soil.
3. Select the final indicator chemicals. Use your judgement -- if a compound has a high water solubility and a long half-life yet is ranked lower than a compound with minimal water solubility and a short half-life, you may wish to move it up in the ranking (refer to Section 3.2 for additional guidance on the final selection).
4. Document any changes in ranking made because of exposure factors.
5. In the last column indicate with a + those chemicals which have been selected as indicator chemicals.

ASSUMPTIONS

List all major assumptions made in the development of data for this worksheet:

a Arsenic eliminated from indicator chemical list during second iteration of evaluation.

302704

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-5 p.3 of 7

SCORING FOR INDICATOR CHEMICAL SELECTION:
EVALUATION OF EXPOSURE FACTORS AND FINAL CHEMICAL SELECTION
Based on Representative Values

Chemical	IS Values PC	IS Values NC	Ranking PC	Ranking NC	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m3/mole)	Koc	Half-Life (Days) GW	Half-Life (Days) SW	Half-Life (Days) Soil	Half-Life (Days) Air	IC
4,4'-DDE	1.195×10^{-8}		9		4×10^{-3}	6.5×10^{-6}	6.8×10^{-5}	4400000	—	—	—	—	
4,4'-DDT	2.77×10^{-8}		8		5×10^{-3}	5.5×10^{-6}	5.13×10^{-4}	243000		56-110	1000-5500	—	
nickel	7.536×10^{-6}	7.176×10^{-3}	7	4	—	0.0	—	—	—	—	—	—	+
1,1-dichloroethane		1.654×10^{-4}		11	5.5×10^{3}	1.82×10^{2}	4.31×10^{-3}	30	—	1-5	—	45	+

INSTRUCTIONS

1. List the top 10 to 15 PC and NC based on IS scores, giving their IS values and their ranking.
2. Refer to Appendix C and record each chemical's solubility, vapor pressure, Henry's law constant, Koc, and half-lives in air, water, and soil.
3. Select the final indicator chemicals. Use your judgement -- if a compound has a high water solubility and a long half-life yet is ranked lower than a compound with minimal water solubility and a short half-life, you may wish to move it up in the ranking (refer to Section 3.2 for additional guidance on the final selection).
4. Document any changes in ranking made because of exposure factors.
5. In the last column indicate with a + those chemicals which have been selected as indicator chemicals.

ASSUMPTIONS

List all major assumptions made in the development of data for this worksheet:

302705

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-5 p. 4 of 7

SCORING FOR INDICATOR CHEMICAL SELECTION:
EVALUATION OF EXPOSURE FACTORS AND FINAL CHEMICAL SELECTION

Based on Representative Values

Chemical	IS Values PC	IS Values NC	Ranking PC	Ranking NC	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m3/mole)	Koc	Half-Life (Days) GW	Half-Life (Days) SW	Half-Life (Days) Soil	Half-Life (Days) Air	IC
ethylbenzene		1.1×10^{-4}		15	1.52×10^{2}	7.0	6.43×10^{-3}	1100	—	1.5-7.5	—	1.46	
antimony		7.86×10^{-3}		3	—	1.0	—	—	—	Pers	—	4.8	+
Cadmium		2.018×10^{-4}		10	—	0.0	—	—	—	Pers	—	4.8	

INSTRUCTIONS

1. List the top 10 to 15 PC and NC based on IS scores, giving their IS values and their ranking.
2. Refer to Appendix C and record each chemical's solubility, vapor pressure, Henry's law constant, Koc, and half-lives in air, water, and soil.
3. Select the final indicator chemicals. Use your judgement -- if a compound has a high water solubility and a long half-life yet is ranked lower than a compound with minimal water solubility and a short half-life, you may wish to move it up in the ranking (refer to Section 3.2 for additional guidance on the final selection).
4. Document any changes in ranking made because of exposure factors.
5. In the last column indicate with a + those chemicals which have been selected as indicator chemicals.

ASSUMPTIONS

List all major assumptions made in the development of data for this worksheet:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-5 p. 5 o 7

SCORING FOR INDICATOR CHEMICAL SELECTION:
EVALUATION OF EXPOSURE FACTORS AND FINAL CHEMICAL SELECTION
Based on Representative Values

Chemical	IS Values PC	IS Values NC	Ranking PC	Ranking NC	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m3/mole)	Koc	Half-Life (Days) GW	Half-Life (Days) SW	Half-Life (Days) Soil	Half-Life (Days) Air	IC
copper		6.169×10^{-3}		5	—	0.0	—	—	—	—	—	—	+
lead		5.866×10^{-4}		7	—	0.0	—	—	—	pers	—	4.8	+
mercury		3.68×10^{-3}		6	—	2.0×10^{-3}	—	—	—	pers	—	4.8	+
zinc		5.439×10^{-3}		8	—	0.0	—	—	—	pers		4.8–20	+

INSTRUCTIONS

1. List the top 10 to 15 PC and NC based on IS scores, giving their IS values and their ranking.
2. Refer to Appendix C and record each chemical's solubility, vapor pressure, Henry's law constant, Koc, and half-lives in air, water, and soil.
3. Select the final indicator chemicals. Use your judgement -- if a compound has a high water solubility and a long half-life yet is ranked lower than a compound with minimal water solubility and a short half-life, you may wish to move it up in the ranking (refer to Section 3.2 for additional guidance on the final selection).
4. Document any changes in ranking made because of exposure factors.
5. In the last column indicate with a + those chemicals which have been selected as indicator chemicals.

ASSUMPTIONS

List all major assumptions made in the development of data for this worksheet:

302707

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-5 p. 6 of 7

SCORING FOR INDICATOR CHEMICAL SELECTION:
EVALUATION OF EXPOSURE FACTORS AND FINAL CHEMICAL SELECTION
Based on Representative Values

Chemical	IS Values PC	IS Values NC	Ranking PC	Ranking NC	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m3/mole)	Koc	Half-Life (Days) GW	Half-Life (Days) SW	Half-Life (Days) Soil	Half-Life (Days) Air	IC
benzene	0.0126	17.021	3	1	1.75×10^{3}	9.52×10^{1}	5.59×10^{-3}	83	—	1-6	—	6	+
carbon tetrachloride	0.375	0.1071	1	13	7.57×10^{2}	9×10^{1}	2.4×10^{-2}	110	—	0.3-300	—	8-30	+
benzo(b)fluoranthene	1.434×10^{-4}		9		1.4×10^{-2}	5×10^{-7}	1.19×10^{-5}	550000	—	1-2	—	5.5	
dieldrin	1.414×10^{-5}		11		1.95×10^{-1}	1.78×10^{-7}	4.58×10^{-7}	1700	—	—	—	—	

INSTRUCTIONS

1. List the top 10 to 15 PC and NC based on IS scores, giving their IS values and their ranking.
2. Refer to Appendix C and record each chemical's solubility, vapor pressure, Henry's law constant, Koc, and half-lives in air, water, and soil.
3. Select the final indicator chemicals. Use your judgement -- if a compound has a high water solubility and a long half-life yet is ranked lower than a compound with minimal water solubility and a short half-life, you may wish to move it up in the ranking (refer to Section 3.2 for additional guidance on the final selection).
4. Document any changes in ranking made because of exposure factors.
5. In the last column indicate with a + those chemicals which have been selected as indicator chemicals.

ASSUMPTIONS

List all major assumptions made in the development of data for this worksheet:

COMBE FILL SOUTH LANDFILL

WORKSHEET 3-5 p. 7 of 7

SCORING FOR INDICATOR CHEMICAL SELECTION:
EVALUATION OF EXPOSURE FACTORS AND FINAL CHEMICAL SELECTION
Based on Representative Values

Chemical	IS Values PC	IS Values NC	Ranking PC	Ranking NC	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m3/mole)	Koc	Half-Life (Days) GW	SW	Soil	Air	IC
chysene	7.069×10^{-6}		12		1.8×10^{-3}	6.3×10^{-9}	1.05×10^{-6}	200000	—	4.4	—	5.5	
selenium		2.12		2	—	0.0	—	—	—	—	—	—	+
silver		0.161		10	—	0.0	—	—	—	—	—	—	

INSTRUCTIONS

1. List the top 10 to 15 PC and NC based on IS scores, giving their IS values and their ranking.
2. Refer to Appendix C and record each chemical's solubility, vapor pressure, Henry's law constant, Koc, and half-lives in air, water, and soil.
3. Select the final indicator chemicals. Use your judgement -- if a compound has a high water solubility and a long half-life yet is ranked lower than a compound with minimal water solubility and a short half-life, you may wish to move it up in the ranking (refer to Section 3.2 for additional guidance on the final selection).
4. Document any changes in ranking made because of exposure factors.
5. In the last column indicate with a + those chemicals which have been selected as indicator chemicals.

ASSUMPTIONS

List all major assumptions made in the development of data for this worksheet:

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4 p. 1 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate
Chloroform	Air	ALL	.00007 mg/m3	.025 mg/m3
	SW	TBK.	0 mg/l	0 mg/l
		UNNAMED TRIB.	0	0
		W.BR.T.BK	.00138	.011
	GW	W. SCHOOLHOUSE LN.	.0291 mg/l	.182 mg/l
		EARLY CHILDHOOD CE.	0	.040
		OTHERS	.00066	.0057

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302710

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4 p.2 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate		
benzene	Air	ALL	.00072 mg/m3	.048 mg/m3		
	SW	T Bk	0 mg/l	0 mg/l		
		Unnamed Trib	0	0		
		W. Br T. Bk	.0204	.141		
	GW	W. Schoolhouse Ln.	0 mg/l	.126 mg/l		
		Early Childhood Center	0	0		
		Others	0	.011		

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302711

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4 p.3 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate
tetrachloroethylene	Air	ALL	.00035 mg/m3	.015 mg/m3
	SW	TBK	0 mg/l	0 mg/l
		UNNAMED	0	0
		W.BR. TBK	.00078	.005
	GW	W. SCHOOLHOUSE LN	.00167 mg/l	.00994 mg/l
		EARLY CHILDHOOD CENTER	0	.005
		OTHERS	0	.0067

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302712

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4 p. 4 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate
1,2-dichloroethane	AIR	ALL	0 mg/m3	0 mg/m3
	SW	T BK	0 mg/l	0 mg/l
		UNNAMED TRIB	0	0
		W. BR. T. BK	.0015	.012
	GW	W. SCHOOLHOUSE LN	.0037 mg/l	.00938 mg/l
		EARLY CHILDHOOD CENTER	0	0
		OTHERS	0	.0185

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302713

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4 p. 5 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate		
trichloroethylene	AIR	ALL	.00024 mg/m³	.015 mg/m³		
	SW	TBK	0 mg/l	0 mg/l		
		UNNAMED TRIB	0	0		
		W. BR. T. BK	.00175	.014		
	GW	W. SCHOOLHOUSE LN.	.00093 mg/l	.0299 mg/l		
		EARLY CHILDHOOD CENTER	0	0		
		OTHERS	.00413	.010		

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302714

WORKSHEET 4-4 p. 6 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate		
arsenic[b]	AIR	ALL	0 mg/m3	0 mg/m3		
	SW	T Bk	.0005 mg/l	.0023 mg/l		
		Unnamed Trib	0	0		
		W. Br T. Bk	.0037	.005		
	GW	W. Schoolhouse Ln	0 mg/l	.005 mg/l[a]		
		Cary/[illegible] Center	0	.007		
		OTHERS	.0014	.005		

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a No arsenic found in D-2 + DW-4 whose average concentrations are used in this column for GW so assumed same as "others"

b Arsenic eliminated as indicator chemical during second iteration of evaluation.

302715

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate		
nickel	AIR	ALL	0 mg/m3	.000008 mg/m3		
	SW	TBK	0 mg/l	0 mg/l		
		UNNAMED TRIB	0	0		
		W. BR. T. BK	.0005	.013		
	GW	W. SCHOOLHOUSE LN	.005 mg/l	.01 mg/l		
		EARLY CHILDHOOD CENTER	0	.005		
		OTHERS	.0017	.01		

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4 p.8 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate		
toluene	Air	ALL	.00212 mg/m³	.057 mg/m³		
	SW	T BK	0 mg/l	0 mg/l		
		UNNAMED TRIB	0	0		
		W. BR. T BK	.0726	1.35		
	GW	W. SCHOOLHOUSE LN	0 mg/l	.0042 mg/l		
		EARLY CHILDHOOD CENTER	0	0		
		OTHERS	0	.0042		

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrat ons are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302717

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate
1,1-dichloroethane	AIR	ALL	0 mg/m3	0 mg/m3
	SW	TBK	0 mg/l	0 mg/l
		UNNAMED TRIB	0	0
		W. BR. T. PK	.0155	.112
	GW	W. SCHOOLHOUSE LN	0 mg/l	.0032 mg/l
		EARLY CHILDHOOD CENTER	0	0
		OTHERS	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302718

COMBE FILL SOUTH LANDFILL

WORKSHEET 4-4 p. 10 of 10

CONTAMINANT CONCENTRATIONS AT EXPOSURE POINTS

Chemical	Release Medium	Exposure Point	Best Estimate	Upper Bound Estimate		
methylene chloride	AIR	ALL	.0064 mg/m^3	.0064 mg/m^3		
	SW	T. BK	.00078 mg/l	.0014 mg/l		
		UNNAMED TRIB	0	0		
		W. BR T. BK	.00125	.005		
	GW	W. SCHOOLHOUSE LN	0 mg/l	.210 mg/l		
		EARLY CHILDHOOD CENTER	0	.01		
		OTHER	.00051	.210		

INSTRUCTIONS

1. List all indicator chemicals.
2. List all release media for each chemical: air, ground water, surface water, soil.
3. List all exposure points for each release medium. Indicate significant exposure point with an asterisk.

Note that air concentrations are in mg/m3 units, water concentrations are in mg/l, and fish concentrations are in mg/kg.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302719

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Western Schoolhouse Lane   p. 1 of 3

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) c	Chronic Daily Intake (mg/kg/day)
chloroform	0.29	0.005	1.45×10^{-3}	—	0.00007	2.03×10^{-5}
benzene	0.29	0.048	0.0139	—	0.00072	2.09×10^{-4}
tetrachloroethylene	0.29	0.015	4.35×10^{-3}	—	0.00035	1.02×10^{-4}
1,2-dichloroethane	0.29	0	0	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Adult average daily intake
b "Upper bound" estimate
c "Best" estimate

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Western Schoolhouse Lane p. 2 of 3

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) c	Chronic Daily Intake (mg/kg/day)
trichloroethylene	0.29	0.015	4.35×10^{-3}	—	0.00024	6.96×10^{-5}
arsenic d	0.29	0	0	—	0	0
nickel	0.29	0.000008	2.32×10^{-6}	—	0	0
toluene	0.29	0.087	0.0257	—	0.00212	6.15×10^{-4}

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

d Arsenic eliminated as indicator chemical during second iteration evaluation.

302721

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Western Schoolhouse Lane

Chemical	a Human Intake Factor (m3/kg/day)	b Short-Term Concentration (mg/m3)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	c Long-term Concentration (mg/m3)	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	0.29	0	0	–	0	0
methylene chloride	0.29	0.0004	1.16×10^{-4}	–	0.0004	1.16×10^{-4}
				–		
				–		

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302722

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Early Childhood Center p. 1 of 3

Chemical	Human Intake Factor (m3/kg/day) [a]	Short-Term Concentration (mg/m3) [b]	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) [c]	Chronic Daily Intake (mg/kg/day)
chloroform	0.5	.005	2.5×10^{-3}	—	.00007	3.5×10^{-5}
benzene	0.5	.048	.024	—	.00072	3.6×10^{-4}
tetrachloroethylene	0.5	.015	7.5×10^{-3}	—	.00035	1.75×10^{-4}
1,2-dichloroethane	0.5	0	0	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Average inhalation for child.

b "Upper bound" estimate

c "Best" estimate

302723

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Early Childhood Center p. 2 of 3

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) c	Chronic Daily Intake (mg/kg/day)
trichloroethylene	0.5	.015	7.5 x 10⁻³	—	.00024	1.2 x 10⁻⁴
arsenic d	0.5	0	0	—	0	0
nickel	0.5	0.000008	4 x 10⁻⁶	—	0	0
toluene	0.5	0.087	.0435	—	0.00212	1.06 x 10⁻³

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

d Arsenic eliminated as indicator chemical during second iteration of evaluation.

302724

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Early Childhood Center   p. 3 of 3

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) c	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	0.5	0	0	–	0	0
methylene chloride	0.5	.0004	2×10^{-4}	–	0.0004	2×10^{-4}

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302725

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Residents to NE, E + S within 0.5 mile   p. 1 of 3

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) c	Chronic Daily Intake (mg/kg/day)
chloroform	0.29	0.005	1.45×10^{-3}	—	0.00007	2.03×10^{-5}
benzene	0.29	0.048	0.0139	—	0.00072	2.09×10^{-4}
tetrachloroethylene	0.29	0.015	4.35×10^{-3}	—	0.00035	1.02×10^{-4}
1,2-dichloroethane	0.29	0	0	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Average adult inhalation

b "Upper-bound" estimate

c "Best" estimate

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Residents to NE, E + S within 0.5 mile

Chemical	Human Intake Factor[a] (m3/kg/day)	Short-Term Concentration[b] (mg/m3)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration[c] (mg/m3)	Chronic Daily Intake (mg/kg/day)
trichloroethylene	0.29	0.015	4.35×10^{-3}	—	0.00024	6.96×10^{-5}
arsenic[d]	0.29	0	0	—	0	0
nickel	0.29	0.000008	2.32×10^{-6}	—	0	0
toluene	0.29	0.087	0.0252	—	0.00212	6.15×10^{-4}

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

d Arsenic eliminated as indicator chemical during second iteration evaluation.

302727

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COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1

CALCULATE AIR INTAKES

Exposure Point: Residents to NE, E, + S within 0.5 mile

p 3 of 3

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) e	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	0.29	0	0	—	0	0
methylene chloride	0.29	0.0004	1.16×10^{-4}	—	0.0004	1.16×10^{-4}

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302728

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1 p 1 of 3

CALCULATE AIR INTAKES

Exposure Point: Recreational Users of Hacklebarney State Park

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) c	Chronic Daily Intake (mg/kg/day)
chloroform	0.29	.00007	2.03×10^{-5}	.01		
benzene	0.29	0.00072	2.09×10^{-4}			
tetrachloroethylene	0.29	0.00035	1.02×10^{-4}			
1,2-dichloroethane	0.29	0	0			

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Average adult inhalation
b "Upper-bound" estimate
c "Best" estimate

302729

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1 p. 2 of 3

CALCULATE AIR INTAKES

Exposure Point: Recreational Users of Hacklebarney State Park

Chemical	Human Intake Factor (m3/kg/day) a	Short-Term Concentration (mg/m3) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) c	Chronic Daily Intake (mg/kg/day)
trichloroethylene	0.29	0.00024	6.96 x 10-5	.01		
Arsenic d	0.29	0	0			
nickel	0.29	0	0			
toluene	0.29	0.00712	2.15 x 10-4			

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

d Arsenic eliminated as indicator chemical during second iteration evaluation.

302730

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-1 p. 3 of 3

CALCULATE AIR INTAKES

Exposure Point: Recreational Users of Hacklebarney State Park

Chemical	Human Intake Factor (m3/kg/day) [a]	Short-Term Concentration (mg/m3) [b]	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/m3) [c]	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	0.29	0	0	.01		
methylene chloride	0.29	0.0004	1.16×10^{-4}			

INSTRUCTIONS

1. List all indicator chemicals.

2. List the short-term and long-term concentration of each chemical in air (from Worksheet 4-4) in the appropriate column.

3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302731

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p 1 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Western Schoolhouse Lane.

Chemical	Human Intake Factor (l/kg/day) a	Short-Term Concentration (mg/l) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l) c	Chronic Daily Intake (mg/kg/day)
Chloroform	.029	0.182	5.28×10^{-3}	—	0.0241	6.99×10^{-4}
benzene	.029	0.126	3.65×10^{-3}	—	0	0
tetrachloroethylene	.029	0.00994	2.88×10^{-4}	—	0.00167	4.84×10^{-5}
1,2-dichloroethane	.029	0.0037	1.07×10^{-4}	—	0.00938	2.72×10^{-4}

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Adult average daily ingestion.

b "Upper-bound" concentration

c "Best-estimate" concentration

302732

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p. 2 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Western Schoolhouse Lane

Chemical	Human Intake Factor (l/kg/day) [a]	Short-Term Concentration (mg/l) [b]	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l) [c]	Chronic Daily Intake (mg/kg/day)
trichloroethylene	.029	0.0284	8.24×10^{-4}	—	0.00093	2.70×10^{-5}
arsenic [d]	.029	0.005	1.45×10^{-4}	—	0	0
nickel	.029	0.01	2.9×10^{-4}	—	0.005	1.45×10^{-4}
toluene	.029	0.0042	1.22×10^{-4}	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

   SDI = Short-term Concentration × Human Intake Factor

4. Determine chronic daily intake (CDI) using the following formula:

   CDI = Long-term Concentration × Human Intake Factor

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

[d] Arsenic was eliminated as indicator chemical during second iteration evaluation.

302733

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p. 3 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Western Schoolhouse Lane

Chemical	Human Intake Factor[a] (l/kg/day)	Short-Term Concentration[b] (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration[c] (mg/l)	Chronic Daily Intake (mg/kg/day)
1,2-dichloroethane	.029	0.0032	9.25×10^{-5}	—	0	0
Methylene chloride	.029	0.210	6.09×10^{-3}	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302734

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p. 1 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Early Childhood Center

Chemical	Human Intake Factor (l/kg/day) a	Short-Term Concentration (mg/l) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l) c	Chronic Daily Intake (mg/kg/day)
chloroform	.05	0.040	2×10^{-3}	—	0	0
benzene	.05	0	0	—	0	0
tetrachloroethylene	.05	0.005	2.5×10^{-4}	—	0	0
1,2-dichloroethane	.05	0	0	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Using 1/2 normal child ingestion

b "Upper-bound" estimate concentration

c "Best-estimate" concentration

302735

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p. 2 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Early Childhood Center

Chemical	Human Intake Factor (l/kg/day)	Short-Term Concentration (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
trichloroethylene	.05	0	0	–	0	0
arsenic[d]	.05	0.0017	8.5×10^{-5}	–	0	0
nickel	.05	0.005	2.5×10^{-4}	–	0	0
toluene	.05	0	0	–	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

[d] Arsenic was eliminated as ~~in~~ indicator chemical during second iteration evaluation.

302736

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2

CALCULATE GROUND-WATER INTAKES

Exposure Point: Early Childhood Center

Chemical	Human Intake Factor (l/kg/day)	Short-Term Concentration (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	.05	0	0	—	0	0
methylene chloride	.05	0.014	7.0×10^{-4}	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302737

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p 1 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Residents to NE, E+S within 0.5 mile

Chemical	Human Intake Factor (l/kg/day) [a]	Short-Term Concentration (mg/l) [b]	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l) [c]	Chronic Daily Intake (mg/kg/day)
chloroform	.029	0.0697	2.02×10^{-3}	—	0.00066	1.91×10^{-5}
benzene	.029	0.0011	3.19×10^{-5}	—	0	0
tetrachloroethylene	.029	0.0067	1.94×10^{-4}	—	0	0
1,2-dichloroethane	.029	0.0185	5.37×10^{-4}	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Average adult daily intake

b "Upper-bound" estimate concentration

c "Best-estimate" concentration

302738

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p. 2 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Residents to NE, E & S within 0.5 mile

Chemical	Human Intake Factor (l/kg/day) a	Short-Term Concentration (mg/l) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l) e	Chronic Daily Intake (mg/kg/day)
trichloroethylene	.029	0.010	2.9×10^{-4}	—	0.00413	1.20×10^{-4}
arsenic d	.029	0.005	1.45×10^{-4}	—	0.0014	4.06×10^{-5}
nickel	.029	0.01	2.9×10^{-4}	—	0.0017	4.93×10^{-5}
toluene	.029	0.0042	1.22×10^{-4}	—	0	0

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

d Arsenic was eliminated as ~~indicator~~ indicator chemical during second iteration evaluation.

302739

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-2 p.3 of 3

CALCULATE GROUND-WATER INTAKES

Exposure Point: Residents to N, E & S within 0.5 mile

Chemical	Human Intake Factor (l/kg/day) a	Short-Term Concentration (mg/l) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l) c	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	.029	0	0	—	0	0
methylene chloride	.029	0.21	6.09×10^{-3}	—	0.00051	1.48×10^{-5}

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in ground water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302740

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p. 1 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Residents to NE, E & S within 0.5 mile

Chemical	Human Intake Factor [a] (l/kg/day)	Short-Term Concentration [b] (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
chloroform	0.014	0	0	.01	NA	NA
benzene	0.014	0	0	.01		
tetrachloroethylene	0.014	0	0	.01		
1,2-dichloroethane	0.014	0	0	.01		

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Using 1/2 normal intake for adults

b "Best-estimate" at Trout Brook

NA= Not applicable

302741

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p. 2 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Residents to NE, E & S within 0.5 mile

Chemical	Human Intake Factor (l/kg/day) a	Short-Term Concentration (mg/l) b	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
trichloroethylene	.014	0	0	.01	NA	NA
arsenic	.014	0.0005	7×10^{-6}	.01		
nickel	.014	0	0	.01		
toluene	.014	0	0	.01		

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Arsenic eliminated as indicator chemical during second iteration evaluation

302742

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p. 3 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Residents to NE, E & S within 0.5 mile

Chemical	Human Intake Factor[a] (l/kg/day)	Short-Term Concentration[b] (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	0.014	0	0	.01	NA	NA
methylene chloride	0.014	0.00078	1.092×10^{-5}	.01	↓	↓

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

302743

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p. 1 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Recreational Users at Hacklebarney State Park

Chemical	Human Intake Factor (l/kg/day) [a]	Short-Term Concentration (mg/l) [b]	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
chloroform	.014	0	0	.01	NA	NA
benzene	.014	0	0	.01		
tetrachloroethylene	.014	0	0	.01		
1,2-dichloroethane	.014	0	0	.01		

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Using 1/2 normal daily adult intake

b "Best-estimate" concentrations at Trout Brook

NA = Not Applicable

302744

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p. 2 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Recreational Users of Hacklebarney State Park

Chemical	Human Intake Factor[a] (l/kg/day)	Short-Term Concentration[b] (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
trichloroethylene	.014	0	0	.01	NA	NA
arsenic[d]	.014	0.0005	7.0×10^{-6}	.01		
nickel	.014	0	0	.01		
toluene	.014	0	0	.01		

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

[d] Arsenic was eliminated as indicator chemical during second iteration evaluation.

302745

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p. 3 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Recreational Users of Hickleberry State Park

Chemical	Human Intake Factor (l/kg/day)	Short-Term Concentration (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	.014	0	0	.01	NA	NA
methylene chloride	.014	.00078	1.09×10^{-5}	.01	↓	↓

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

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COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p1of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Western Schoolhouse Lane

Chemical	Human Intake Factor[a] (l/kg/day)	Short-Term Concentration[b] (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
chloroform	.014	0	0	.01	NA	NA
benzene	.014	0	0	.01		
tetrachloroethylene	.014	0	0	.01		
1,2-dichloroethane	.014	0	0	.01		

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$\text{SDI} = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$\text{CDI} = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

a Using 1/2 normal adult ingestion

b "Best-estimate" concentration at unnamed tributary

NA= Not Applicable

302747

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p. 2 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Early Childhood Center

Chemical	Human Intake Factor[a] (l/kg/day)	Short-Term Concentration[b] (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
tetrachloroethylene	.05	0	0	.01	NA	NA
arsenic[d]	.05	0.0005	2.5×10^{-5}	.01		
nickel	.05	0	0	.01		
toluene	.05	0	0	.01		

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

d Arsenic eliminated as indicator chemical during second iteration evaluation.

COMBE FILL SOUTH LANDFILL

WORKSHEET 5-3 p 3 of 3

CALCULATE SURFACE WATER INTAKES

Exposure Point: Early Childhood Center

Chemical	a Human Intake Factor (l/kg/day)	b Short-Term Concentration (mg/l)	Subchronic Daily Intake (mg/kg/day)	Duration (fraction of year)	Long-term Concentration (mg/l)	Chronic Daily Intake (mg/kg/day)
1,1-dichloroethane	.05	0	0	.01	NA	NA
methylene chloride	.05	0.00078	3.9×10^{-5}	.01	↓	↓

INSTRUCTIONS

1. List all indicator chemicals.
2. List the short-term and long-term concentration of each chemical in surface water (from Worksheet 4-4) in the appropriate column.
3. Determine subchronic daily intake (SDI) using the following formula:

$$SDI = \text{Short-term Concentration} \times \text{Human Intake Factor}$$

4. Determine chronic daily intake (CDI) using the following formula:

$$CDI = \text{Long-term Concentration} \times \text{Human Intake Factor}$$

5. Include duration of subchronic exposure represented by the intake estimate, in fraction of year.

ASSUMPTIONS

List all major assumptions in developing the data for this worksheet:

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