ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATION

Ilion Landfill
Site No. 622004
Village of Ilion, Herkimer County

Final – April 1988

RECEIVED
APR 28 1988

Prepared for:

New York State
Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling, Commissioner
Division of Hazardous Waste Remediation
Michael J. O'Toole, Jr., P.E., Acting Director

Prepared by:

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

EA REPORT DEC52E1

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK PHASE II INVESTIGATIONS

ILION LANDFILL
VILLAGE OF ILION, HERKIMER COUNTY
NEW YORK I.D. NO. 622004

RECEIVED
JUN 3 1988
NYS Dept. Environmental Conservation
REGION 6
REGIONAL ENGINEER

Prepared for

Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

Prepared by

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R.D. 2, Goshen Turnpike
Middletown, New York 10940

A Division of EA Engineering, Science, and Technology, Inc.

April 1988

CONTENTS

1. EXECUTIVE SUMMARY

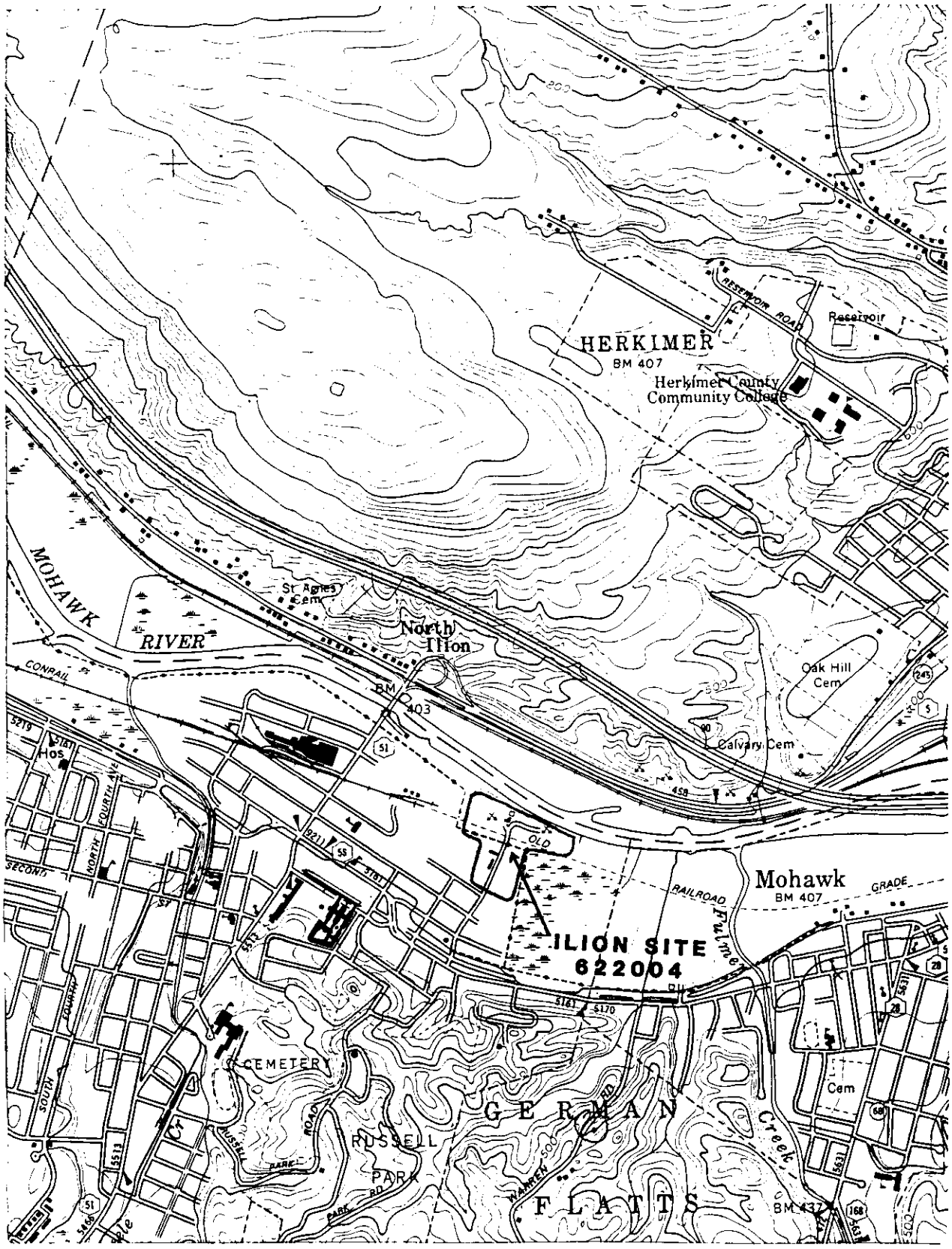
The Ilion landfill (New York State I.D. No. 622004) is an inactive dump located at the end of East Street in the Village of Ilion, Herkimer County, New York (Figure 1-1). The site is approximately 25 acres in size; bordered by the Mohawk River/Barge Canal to the north, wetlands to the east and west, and residential property to the south.

The site was used by the Village of Ilion between 1933-1971 as a dump to dispose of municipal waste, including wastes from Remington Arms and other local industries. An onsite incinerator was used to burn wastes. The plant operator during the dump's operations stated all dangerous materials (oils and lacquer) were burned and no longer remain at the site. Currently, the site is used by the Village of Ilion for its Department of Public Works office and garage. A ballfield and tennis courts were constructed on the site in 1980 (Figure 1-2).

The Phase II investigation consisted of: a record search to obtain information on site history, a site inspection and interviews to observe and document current conditions, and the performance of field activities to evaluate hydrogeological conditions and the potential for ground-water and/or surface-water contamination. The field activities included the performance of geophysical surveys (conductivity and resistivity); installation of test borings/monitoring wells completed in overburden; short-term, low-yield pumping tests; and environmental sampling for analysis of the Hazardous Substance List of inorganic parameters and organic compounds.

COORDINATES
LATITUDE: 43° 01' 08"
LONGITUDE: 75° 01' 41"

ILION LANDFILL



ILION QUAD

7.5 Minute Series

1978 Edition

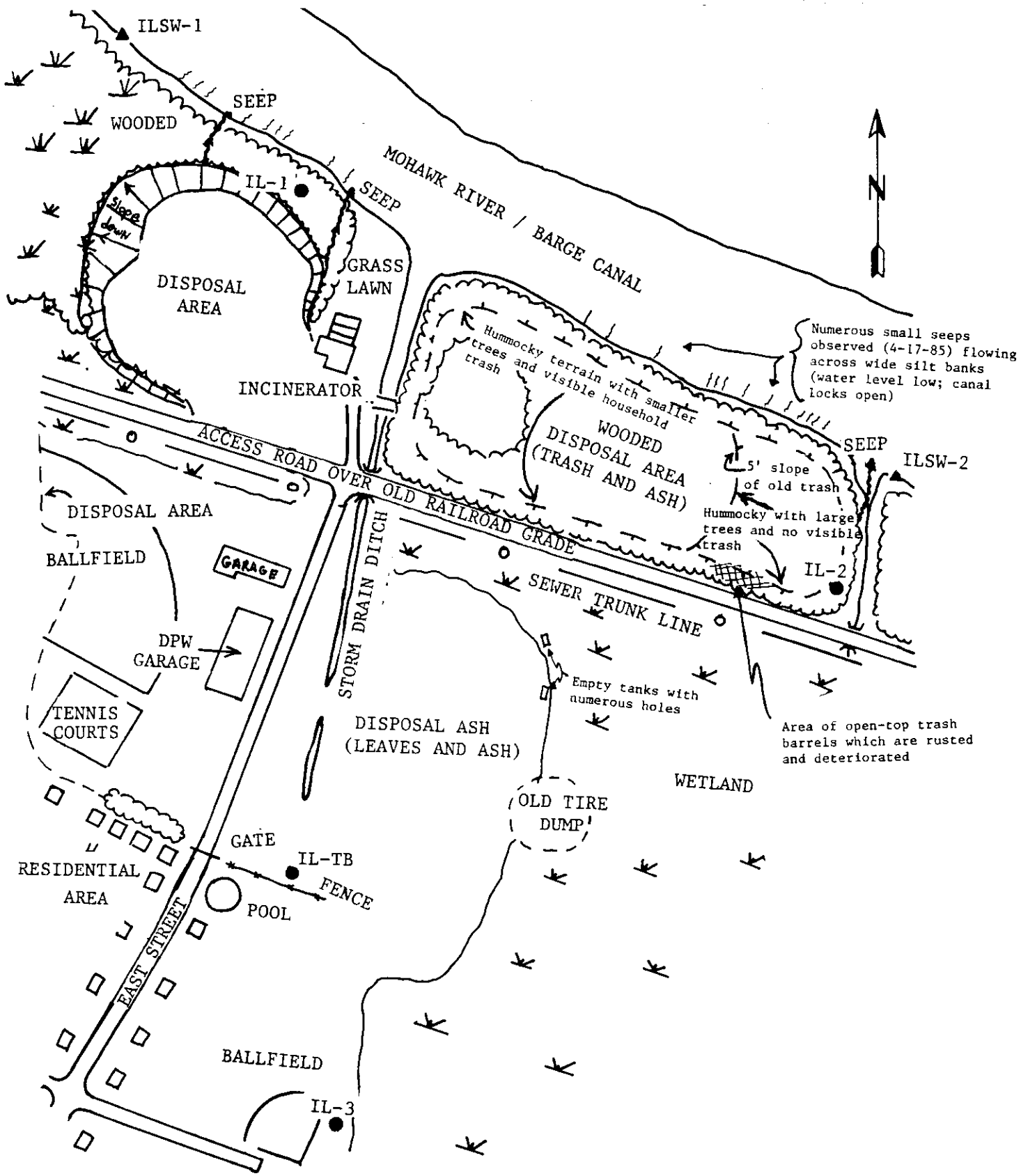
0 2000 Feet

SCALE: 1 in.=2000 ft.

Figure 1-1

SITE SKETCH

ANNOTATED DURING EA'S SITE VISIT ON 17 APRIL 1985



Note: Base map modified (enlarged) from 21 June 1984 aerial photograph.

0 300'

APPROX. SCALE

Figure 1-2

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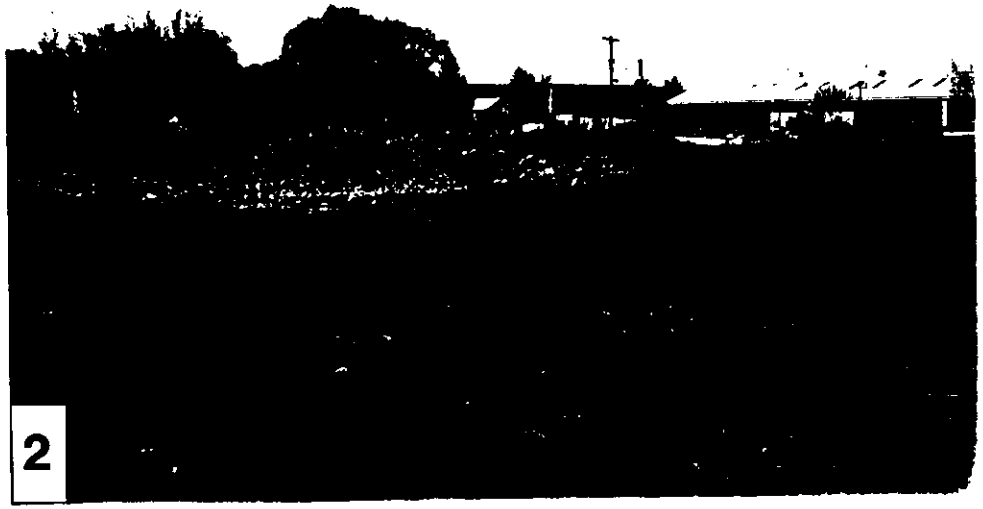

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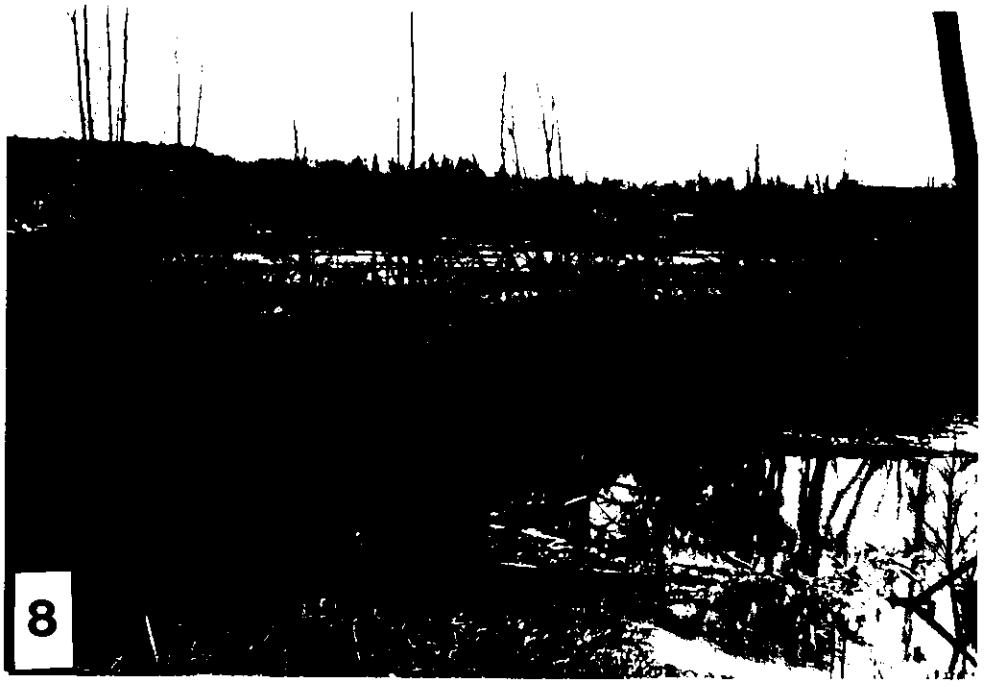

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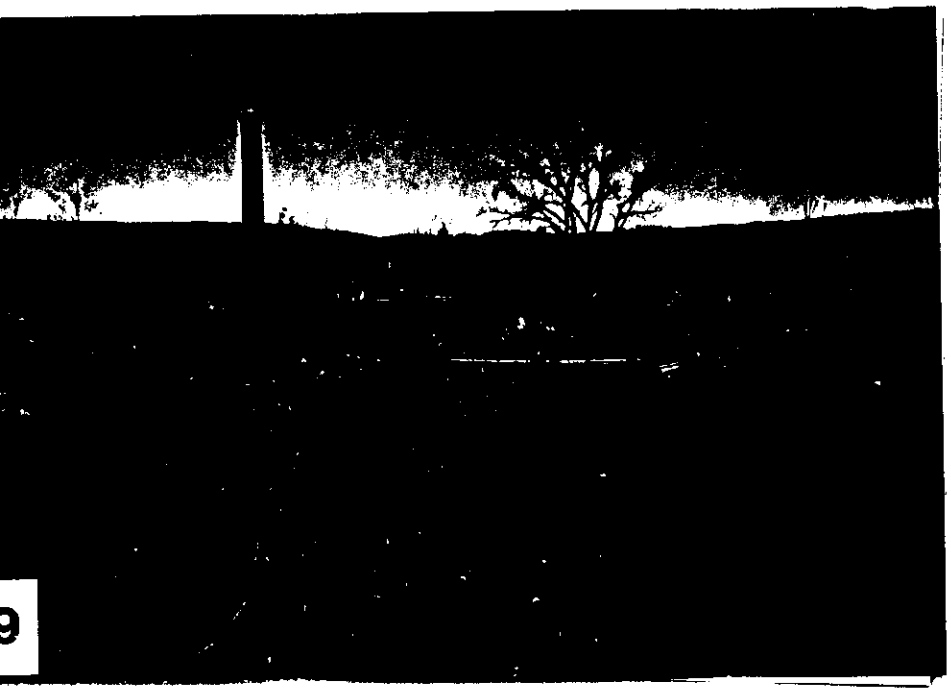
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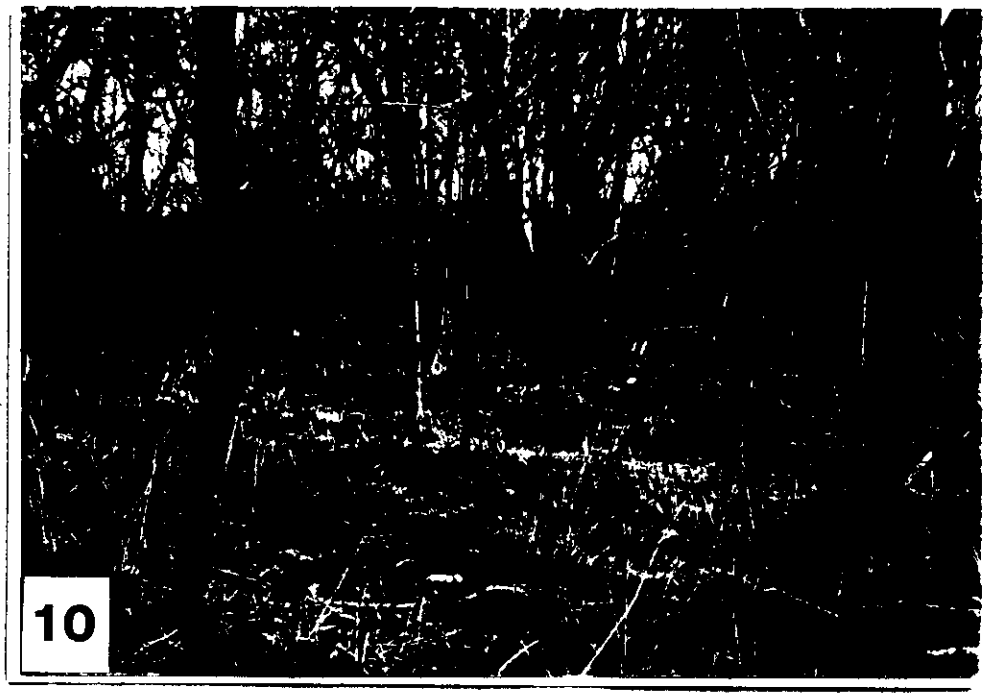
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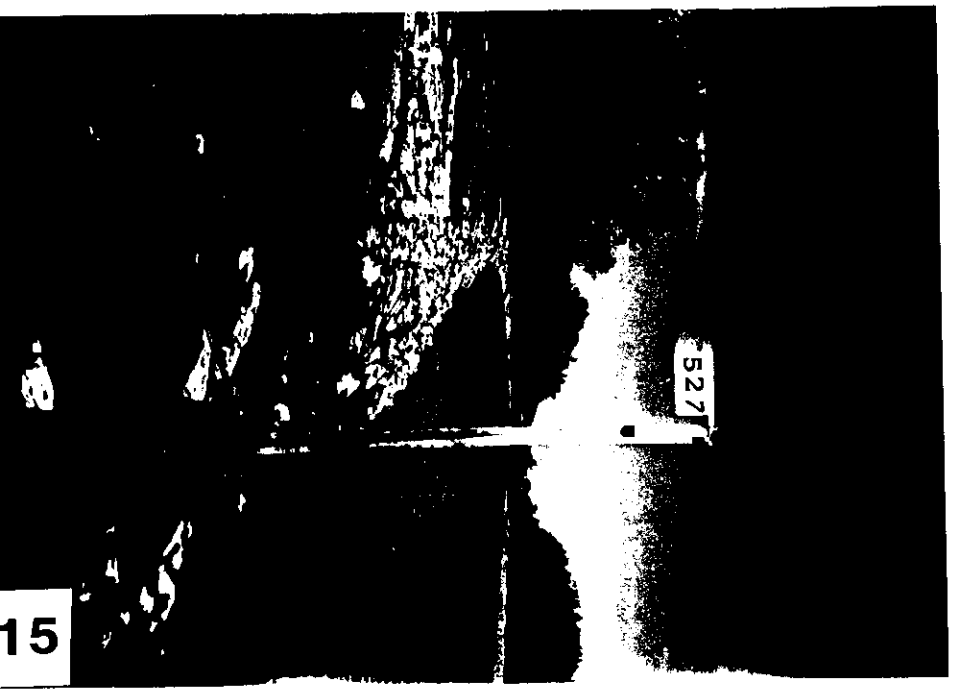

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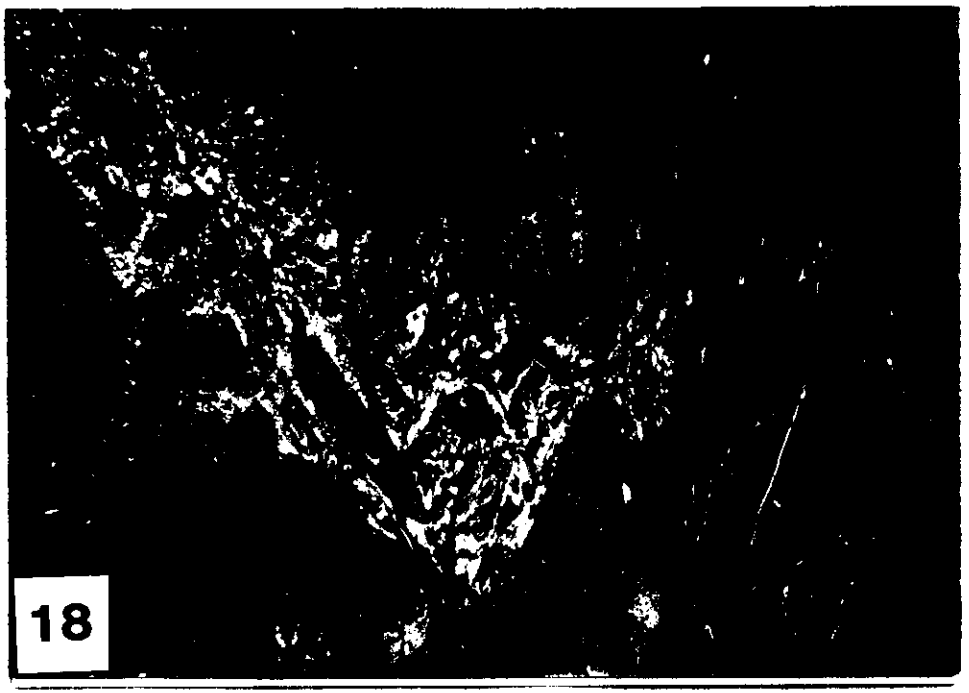
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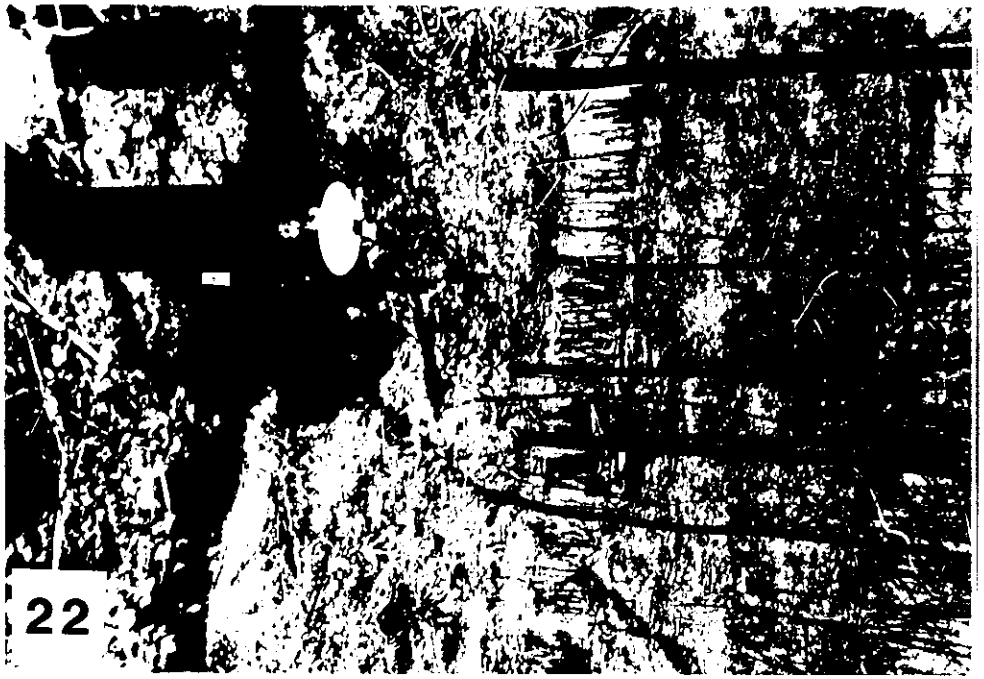

22


23


24

PHOTO LOG - ILION LANDFILL
(17 April 1985, Except as Noted)

Photo No.	Description
1 and 2	Southerly and southwesterly views across the ash and leaf disposal area (southeastern quadrant of the site shown on Figure 1-2). Ilion's Department of Public Works (DPW) office and garage are shown at the right center of Photo No. 2. Bulk gravel storage piles are also shown in these two photos.
3	Easterly view across another portion of the site shown in Photo Nos. 1 and 2. The tree line at the edge of the field denotes the boundary with the wetland further east. Along this boundary, in the vicinity of the telephone pole, is the western edge of the old tire dump (Figure 1-2).
4	The southern of the two empty tanks shown on Figure 1-2. Both tanks have numerous holes in the side submerged in the wetland. The tank shown is located at the tree line shown on the upper left portion of Photo No. 3.
5	Southerly view along the storm drain ditch from the access road/old railroad grade. Ilion's DPW office/garage is shown in the upper right of this photo.
6	Northerly view (directly opposite of Photo No. 5) along the storm drain ditch. Also shown is a portion of an abandoned natural gas pipe line (canal locks are open and river stage is low).
7 and 8	Southwesterly panorama across the portion of the disposal area located west of the DPW garage. This area has been developed into ballfields and tennis courts. The foreground of the photo is the wetland located between the northwestern disposal area of the site and the access road/old railroad grade.
9	Easterly view across the northwestern disposal area of the site toward the old abandoned Ilion incincerator.
10	Westerly view across the hummocky, overgrown eastern end of the landfill located adjacent to the barge canal/river.
11	Southerly view across an approximately 5-ft slope of exposed trash located just west of (beyond) Photo No. 10.
12	Area of open-top trash barrels which are rusted and deteriorated, located north of the access road/old railroad grade in the eastern portion of the site (Figure 1-2).
13	Northerly view of the creek along the northeastern edge of the site just prior to confluence of the river/barge canal.

PHOTO LOG - ILION LANDFILL (Cont.)

Photo No.	Description
14	Northwesterly view along the Mohawk River/barge canal when canal locks are open and the river stage is low. View is from the northeastern corner of the site. Also shown on this photo are numerous small seeps across the exposed mud flat. The northern edge of the Ilion Landfill is shown along the left edge of this photo.
15	Northwesterly view along the Mohawk River/barge canal from just northeast of the site (20 April 1987). The area detailed in Photo No. 14 is located adjacent to the large tree shown approximately left center of Photo No. 15.
16	Northwesterly view similar to Photo Nos. 14 and 15, except that the canal locks are closed and the river level is high (23 May 1985).
17	Southeasterly view along the Mohawk River/barge canal on 23 May 1985, from the northern edge of the Ilion Landfill (opposite view from Photo No. 16). Note that the pole and 527 marker shown in Photo No. 15 are surrounded by the river/canal in the upper left central portion of Photo No. 17.
18	Southerly view of the main easternmost seep just prior to confluence with the river/canal, and which emanates from the northeast corner of the site (Figure 1-2).
19	Southerly view of the western of two main seeps which emanate from the northwestern disposal area and flow into the river/canal. The slope in the upper portion of this photo is the toe of the fill material.
20	Southerly view similar to Photo No. 19 but taken from slightly further north where the seep crosses the mud flat just prior to confluence with the river/canal.
21	Southerly view of the eastern of the two main seeps which emanate from the northwestern disposal area and flow toward the river/canal (Figure 1-2).
22	Easterly view of monitoring Well IL-2 (21 April 1987).
23	Northwesterly view of the ILSW-1 and ILSED-1 sample location on 21 April 1987 (Figure 1-2).
24	Southeasterly view of the ILSW-2 and ILSED-2 sample location on 21 April 1987 (Figure 1-2).

2. PURPOSE

The goal of the Phase II investigation was to: (1) obtain available records on the site history from state, federal, county, and local agencies; (2) obtain information on site topography, geology, local surface and ground-water use, contamination assessments, and local demographics; (3) interview site owners, operators, and other groups or individuals knowledgeable of site operations; (4) conduct a site inspection to observe current conditions; (5) perform geophysical surveys at and around the site to evaluate the potential presence of ground-water contaminant plumes, and stratigraphic information; (6) install test borings/monitoring wells and perform environmental sampling; and (7) prepare a Phase II report. The Phase II report includes a final Hazard Ranking Score (HRS), an assessment of the available information, and a recommendation for remedial work, if warranted.

3. SCOPE OF WORK

3.1 RECORD SEARCH/DATA COMPILATION

A record search/data compilation and interviews were conducted as part of the Phase II investigation of the Ilion landfill. Appendix 1.3.1-1 contains a list of agencies or individuals contacted.

3.2 FIELD ACTIVITIES

3.2.1 Site Reconnaissance

EA Science and Technology conducted a site reconnaissance on 17 April 1985 to familiarize key project personnel with the site. During the site reconnaissance, visible waste and/or filled areas were located, tentative locations for test borings/observation wells and sampling were selected, accessibility was evaluated, and HNU measurements (upgradient and site-wide) were obtained to help the Safety Officer develop specific health and safety requirements for the field activities. No organic vapors were detected above background by the HNU photoionizer during the site reconnaissance (refer to Figure 1-2 which indicates the features observed during the site reconnaissance). Photographs of the site were taken and significant features were noted on an aerial photograph (Scale: 1" = 300', 21 June 1984) of the site.

3.2.2 Geophysical Surveying

Geophysical surveys of the site were conducted by Delta Geophysical, Inc. under EA's supervision on 23 and 24 May 1985.

The purpose of the geophysical investigation was to non-destructively, accurately, and cost effectively evaluate possible subsurface conditions at the site, including stratigraphy, depth to water, and potential contaminant plumes. The geophysical information (anomalous zones) were then used to aid in final selection of the locations for monitoring wells.

The existing site data (geology, area size, hydrogeology, etc.) were reviewed. Upon completion of the geophysical surveys for each of the sites, interpretation of the geophysical data was made prior to leaving the site. Monitoring wells were then located in accordance with anomalous zones, general hydrogeologic information, and physical accessibility for a drill rig.

The geophysical technique used first at the site was a perimeter terrain conductivity (electromagnetic or EM) survey, using an EM-34 with 10-meter cable and effective depth of penetration of 25 and 45 feet below grade. The data gathered from this type of survey indicated subsurface zones of anomalous conductivity. The second technique used was resistivity. This method measures vertical changes in subsurface resistivities, providing for evaluation of depth to ground water, depth to rock, and general stratigraphy (refer to Appendix 1.3.2-1 for details, e.g., specific geophysical survey locations and resultant interpreted anomalous zones).

3.2.3 Observation Well Installation

For the purpose of establishing ground-water flow direction and to document a release of contaminants to the ground water at the site, monitoring wells were installed in a triangular pattern around the perimeter of the site, both upgradient and downgradient of the landfill. Based on topography and the Mohawk River/barge canal, ground water was anticipated to flow towards the northeast. Test boring IL-TB was installed south of the site upgradient of the disposal areas to characterize ambient ground-water concentrations. During drilling operations, however, a black tar-like substance was found in the sediment. As a result, IL-TB was abandoned and a new location (IL-3) was selected further south of the landfill. Boring IL-TB was abandoned by filling with grout as requested by NYSDEC. The well installation procedure is detailed in Appendix 1.3.2-2.

Monitoring well IL-2 was installed downgradient of the disposal area on the northwest edge of the site. This particular location was part of an anomalous zone (possible subsurface contamination) detected by the geophysical terrain conductivity survey. Monitoring well IL-3 was also installed downgradient of the landfill, on the northeastern edge of the site.

The three test borings/monitoring wells were installed at the site (Figure 3-1) on 2 and 3 July 1985. This was performed under the fulltime supervision of an EA geologist.

Access to the well locations required the use of a truck-mounted CME-45 drill rig. The three threaded-joint PVC monitoring wells (IL-1, IL-2, and IL-3) were completed in unconsolidated sediment using a 4-1/4-in. I.D. hollow-stem auger.

The boring logs and well schematics of the test borings/monitoring wells are shown in Figures 3-2 through 3-4. The grain size analysis was performed on selected representative sediment samples collected during drilling. The resultant data curves are presented in in Figures 3-5 through 3-13.

On 9 July 1985, the monitoring wells were developed using a centrifugal pump. Polyethylene flexible pipe with a flat washer attached approximately 6 inches from the end was used as the suction line. The washers allowed the well to be surged as it was pumped. New polyethlene flexible pipe and washers were used in each well.

Development of Well IL-2 was completed shortly after well installation was completed. Wells IL-1 and IL-3 recharged poorly and required additional development, performed during other field activites (e.g., pump tests and surveying).

Upon completion and development of the monitoring wells, vertical elevation of the upper rim of each PVC well casing was surveyed to aid in evaluation of the ground-water flow direction. A Kern-Swiss Automatic Construction Level GKO-A was used to perform the surveying. Elevations were determined in feet below/above an assumed datum of 100 ft, established on the upper rim of the Well IL-3 PVC well casing. A short-term, low-yield pumping test was performed in each monitoring well using a centrifugal pump. New polyethylene flexible pipe was used as the suction line in each well. Figures 3-14 to 3-19 present the pumping test data curves. The pumping tests and surveying were performed on 10 October 1985. Table 3-1 provides a summary of well data for the site. Development and pumping test procedures are detailed in Appendix 1.3.2-2.

3.2.4 Sampling

Sampling of the Ilion landfill was performed by EA personnel during 12 and 13 November 1985. Purging of the monitoring wells was performed on 12 November 1985 using a centrifugal pump. The program included three ground-water samples (one from each Phase II well), two surface water samples from the Mohawk River/ barge canal (one upstream and one downstream of the site), and two streambed sediment samples collected at the location of each surface water sample. Refer to Figure 3-1 for sample locations. EA planned to sample leachate seeps also; however, when sampling was performed, the seeps were dry and/or beneath the seasonally increased level of the river/barge canal. The sampling procedures are detailed in Appendix 1.3.2-3. EA's Field Data Sheets for purging and sampling are provided as Figures 3-20 to 3-22.

The analytical program for the water and sediment samples included the inorganic parameters and the organic compounds of the Hazardous Substance List, plus identification and quantification of all non-priority pollutant GC/MS major peaks (those whose peak area is 10 percent or greater than the calibrating standards). The program was performed in accordance with NYSDEC-CLP. The full CLP package of analytical results is included as Appendix 3 (bound separately) of this report.

Due to missed holding times, ground water sample locations (IL-1, IL-2, and IL-3), surface water sample locations (ILSW-1 and ILSW-2), and sediment sample locations (ILSED-1 and ILSED-2) were resampled on 21 April 1987. Ground water and surface water samples were analyzed for pesticides and PCBs of the

Hazardous Substance List (HSL). The sediment samples were analyzed for Base/Neutral Organics, Acid Extractable Organics, Pesticides and PCBs of the HSL. Holding times were again missed for analysis of pesticides and PCBs. EA's Field Data Sheets for purging and sampling for the resampling are provided as Figures 3-23 to 3-25.

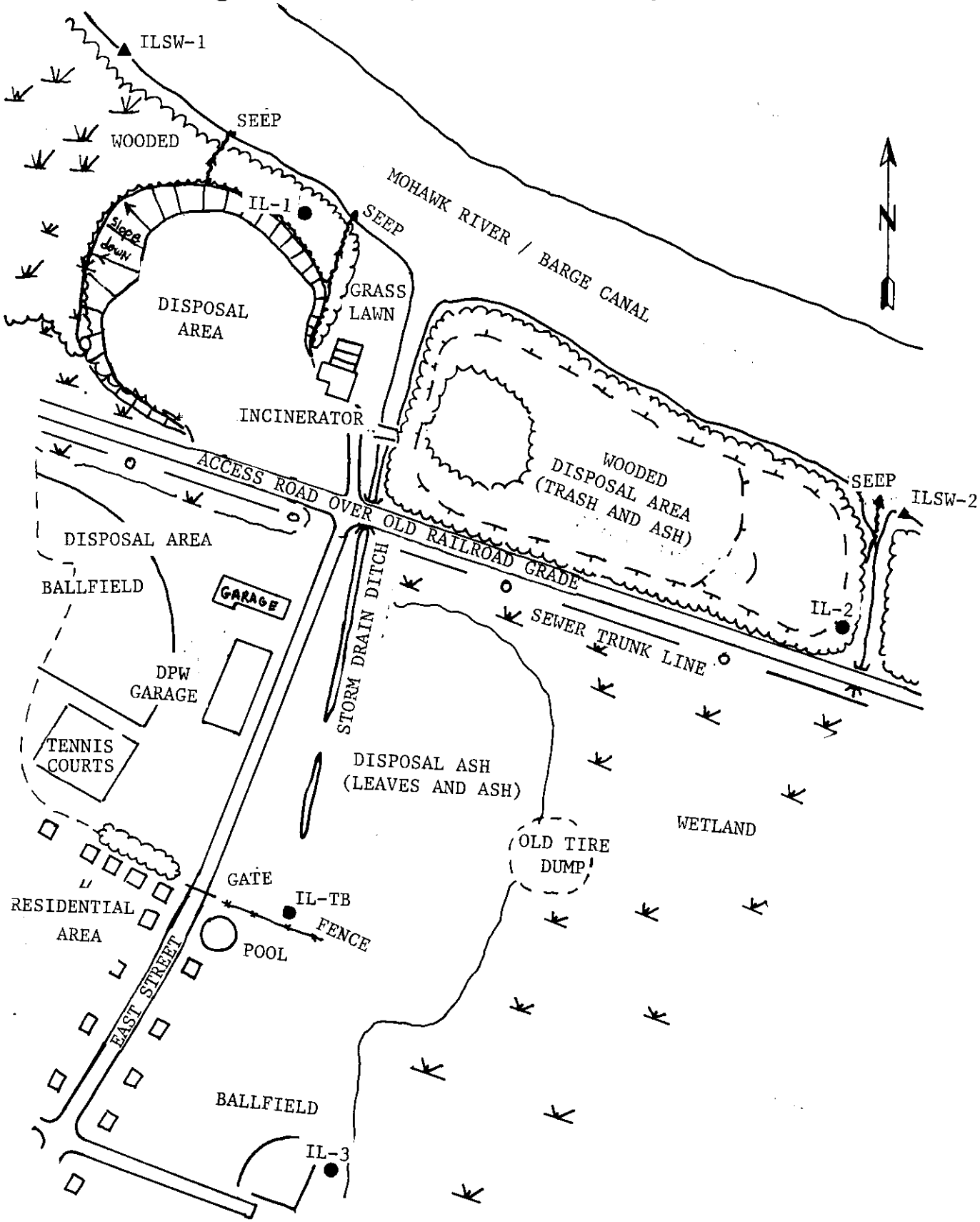
TABLE 3-1 ILION SITE: SUMMARY OF MONITORING WELL DATA

Well No.	Observation Well			Ground Water		
	Stickup (Ft above Ground Surface)	Total Depth (Ft below Ground Surface)	Elevation** of MP*	Date	Depth (Ft below MP)*	Elevation**
IL-1	1.80	14.0	101.24	07/02/85	5.10	96.14
IL-1	1.80	14.0	101.24	10/10/85	4.51	96.73
IL-1	1.80	14.0	101.24	11/12/85	3.74	97.50
IL-1	1.80	14.0	101.24	04/21/87	10.04	91.20
IL-2	1.71	16.0	100.10	07/02/85	4.60	95.50
IL-2	1.71	16.0	100.10	10/10/85	3.73	96.37
IL-2	1.71	16.0	100.10	11/12/85	3.55	96.55
IL-2	1.71	16.0	100.10	04/21/87	6.41	93.69
IL-3	1.55	14.0	100.00	07/03/85	3.11	96.89
IL-3	1.55	14.0	100.00	10/10/85	1.92	98.08
IL-3	1.55	14.0	100.00	11/12/85	1.73	98.27
IL-3	1.55	14.0	100.00	04/21/87	1.69	98.31

* MP = Measuring point (top of PVC casing).
** Feet above or below an assumed datum of 100 ft, established at Well IL-3.

SITE SKETCH

Test boring/Monitoring well and Sampling Locations



Note: Base map modified (enlarged) from 21 June 1984 aerial photograph.

0 300'

APPROX. SCALE

Figure 3-1

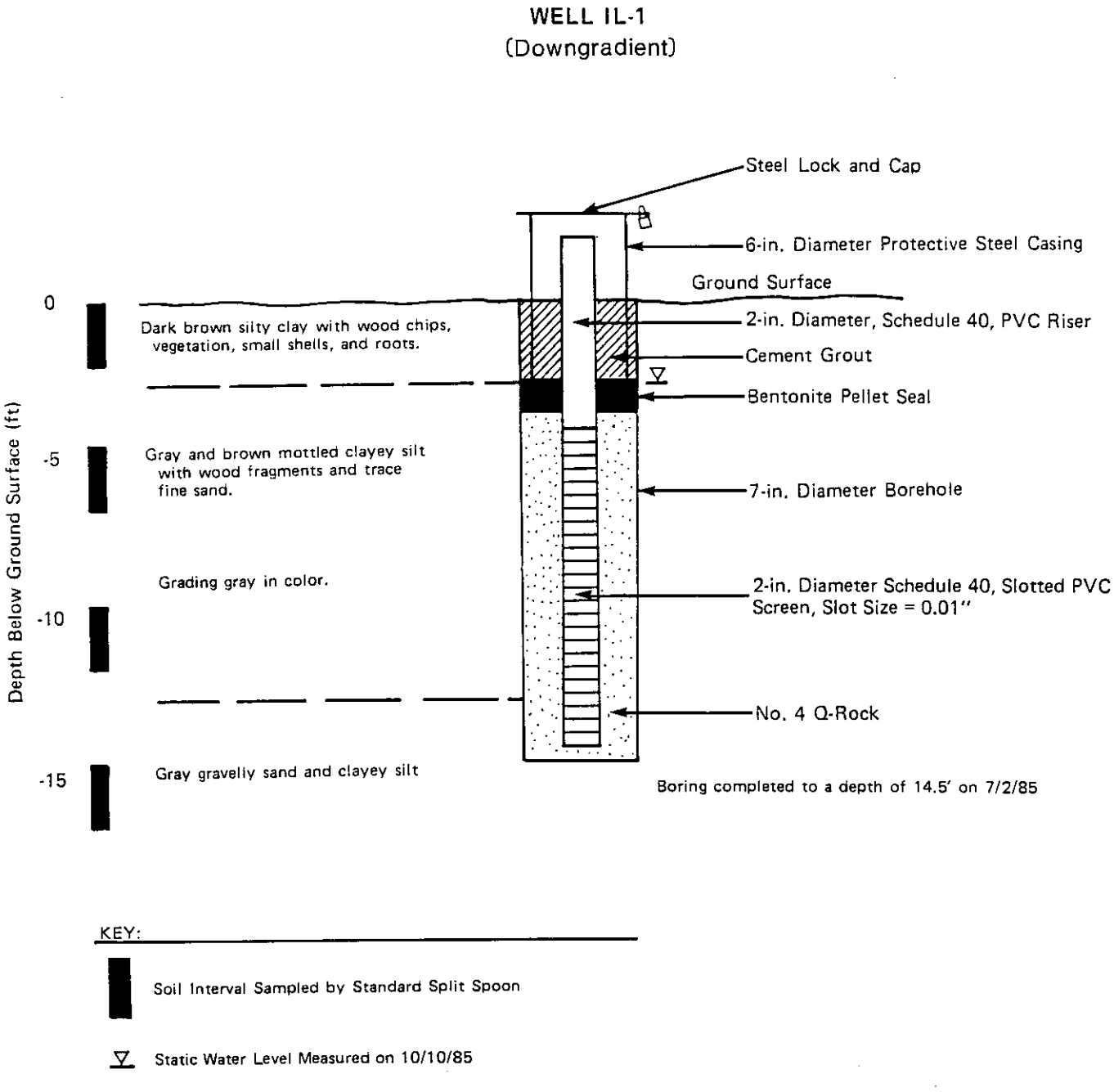


Figure 3-2. Boring log and well schematic, Ilion Landfill Site.

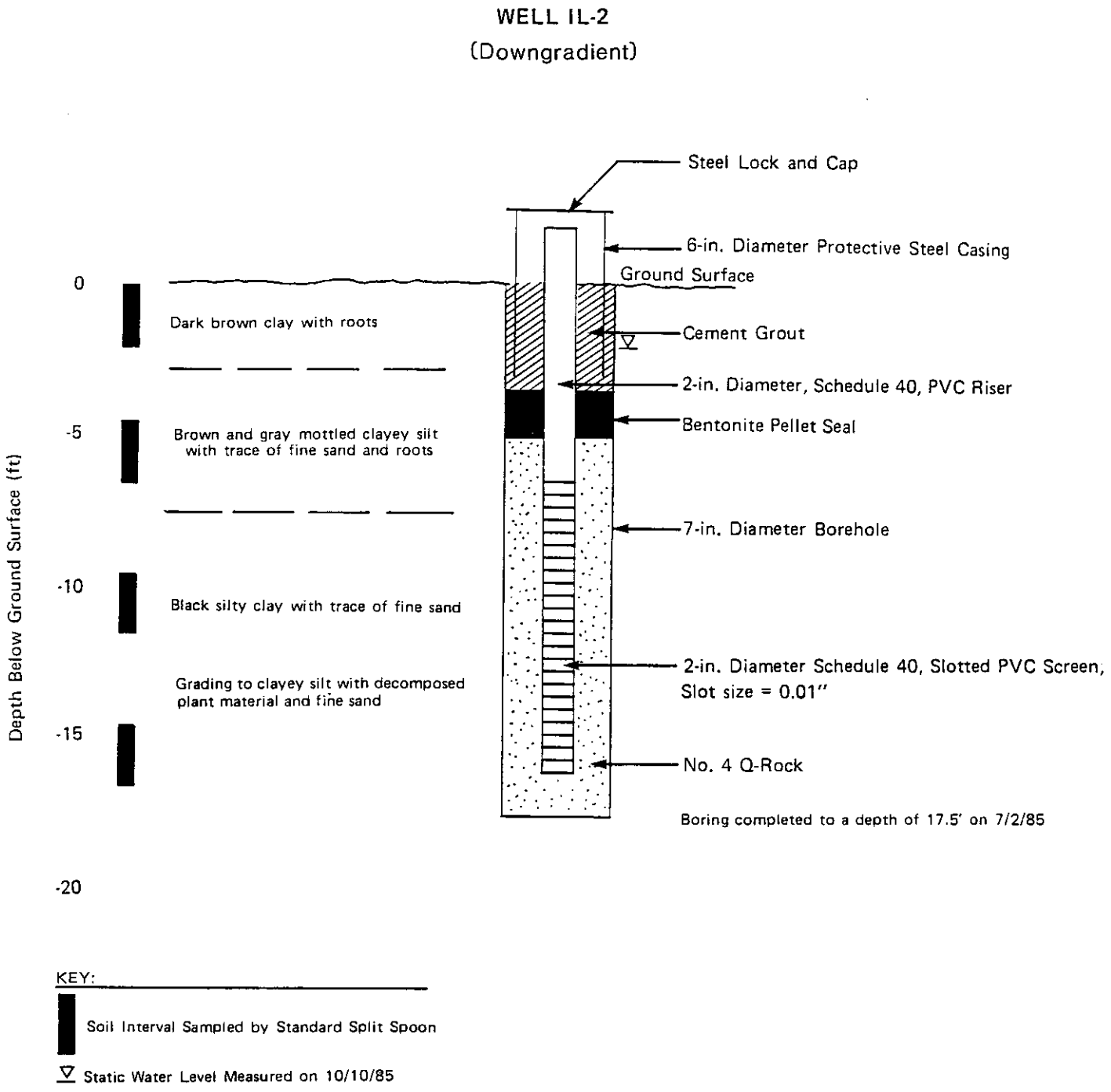


Figure 3-3. Boring log and well schematic, Ilion Landfill Site.

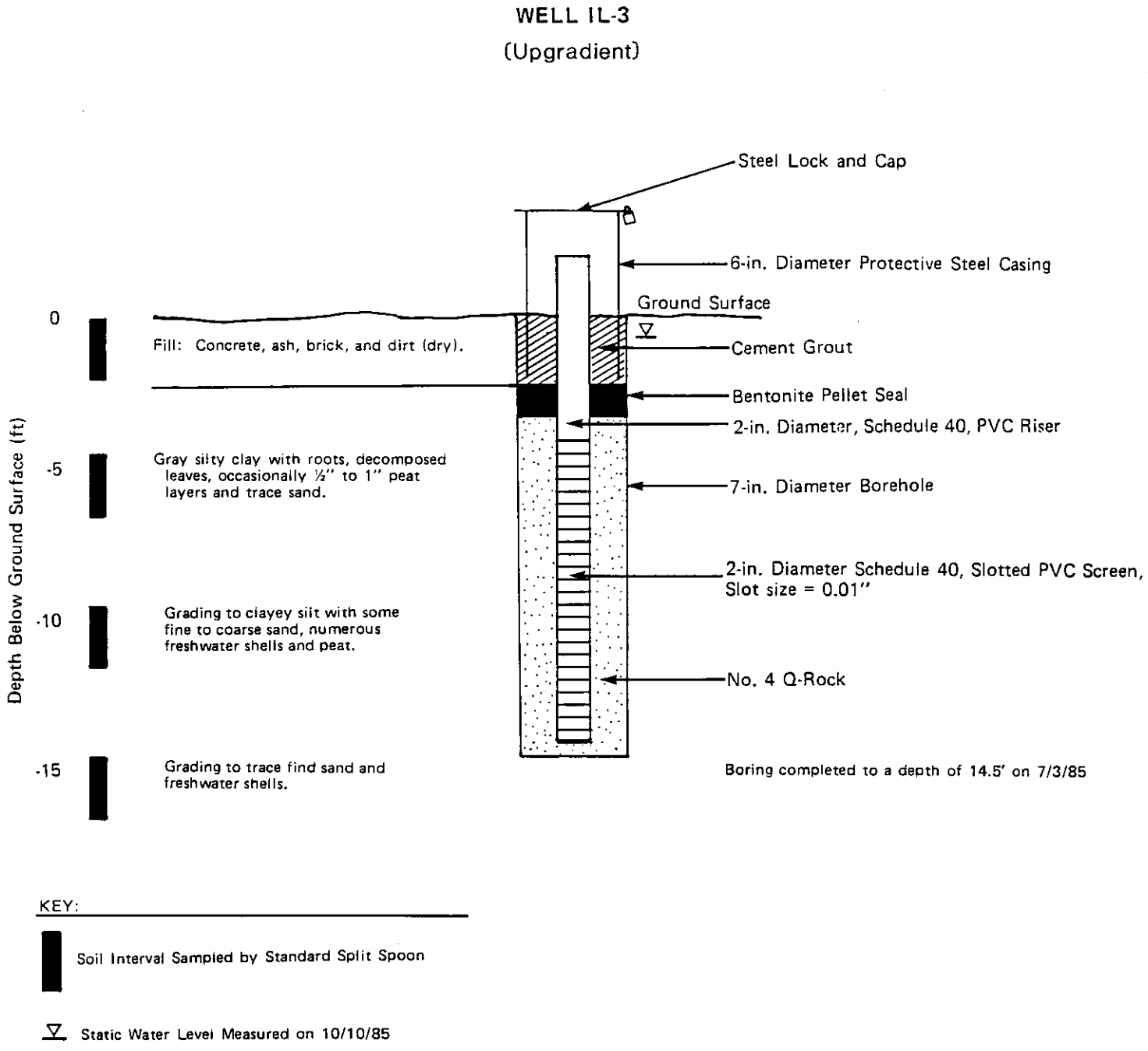


Figure 3-4. Boring log and well schematic, Ilion Landfill Site.

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilion

Boring No. IL-1 Sample No. 2

Depth 4.5-6.5 Elevation

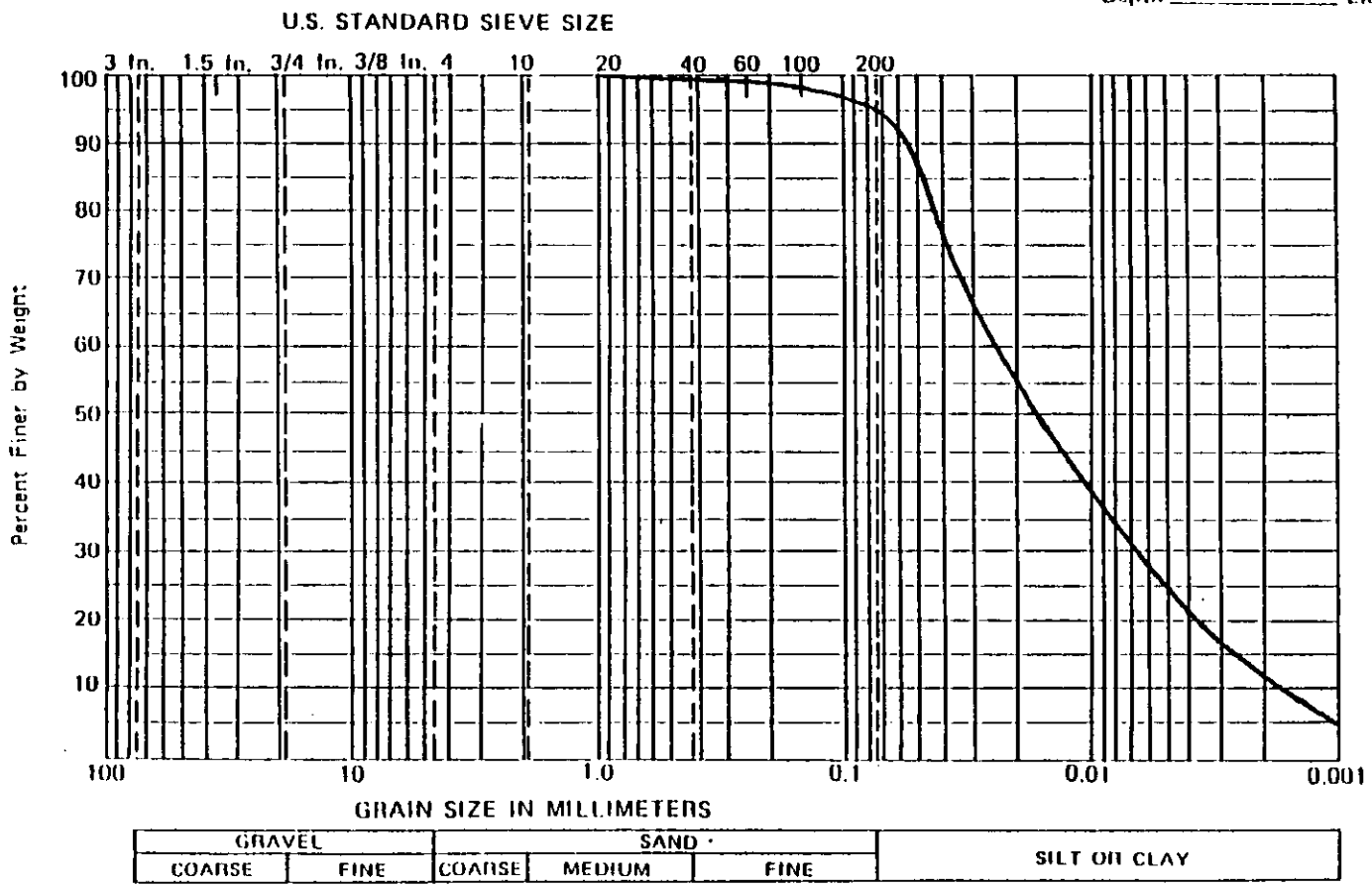


Figure 3-5

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilion

Boring No. IL-1 Sample No. 3

Depth 9.5-11.5 Elevation

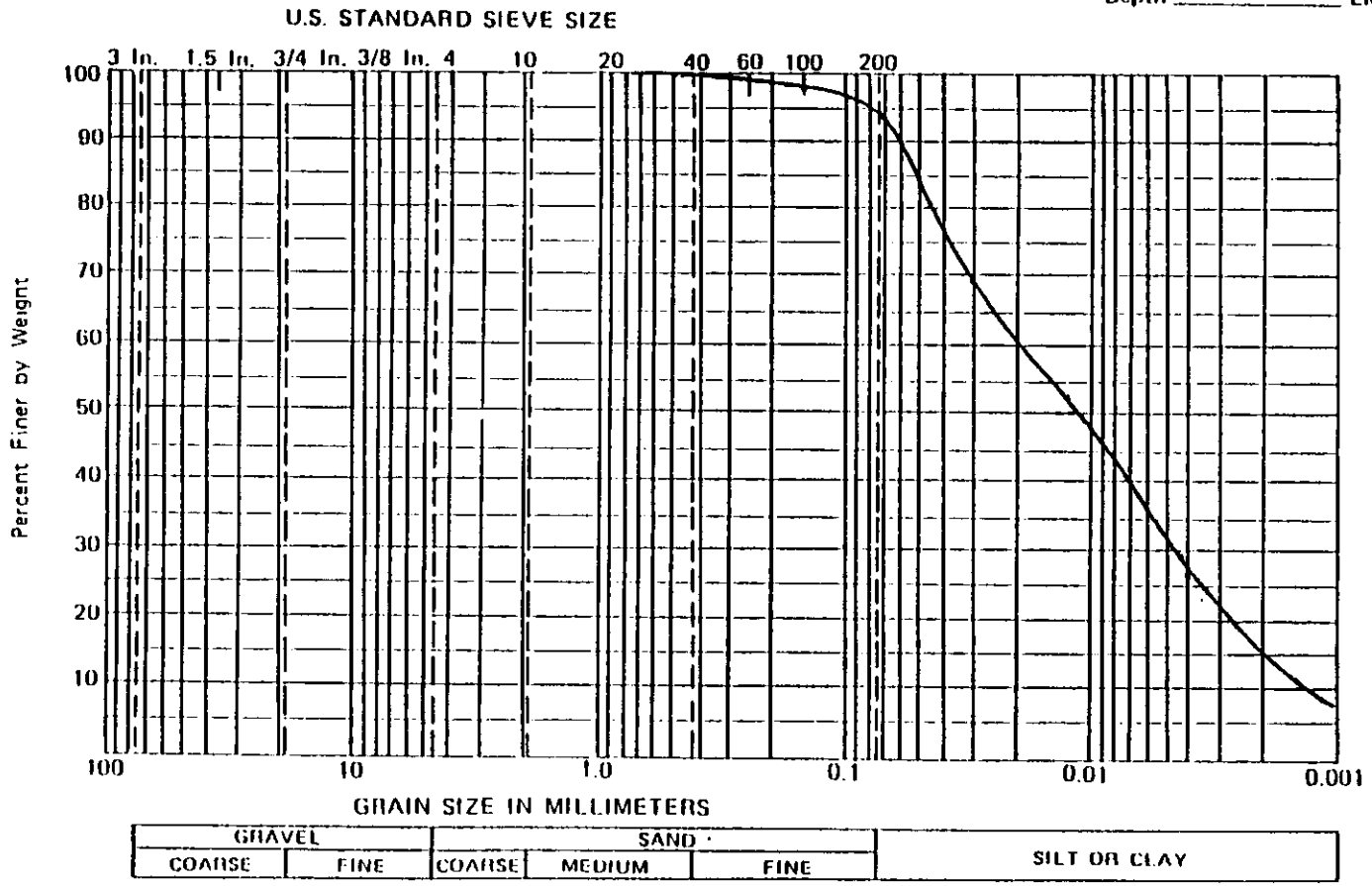


Figure 3-6

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Illon

Boring No. IL-1 Sample No. 4

Depth 14.5-16.5 Elevation

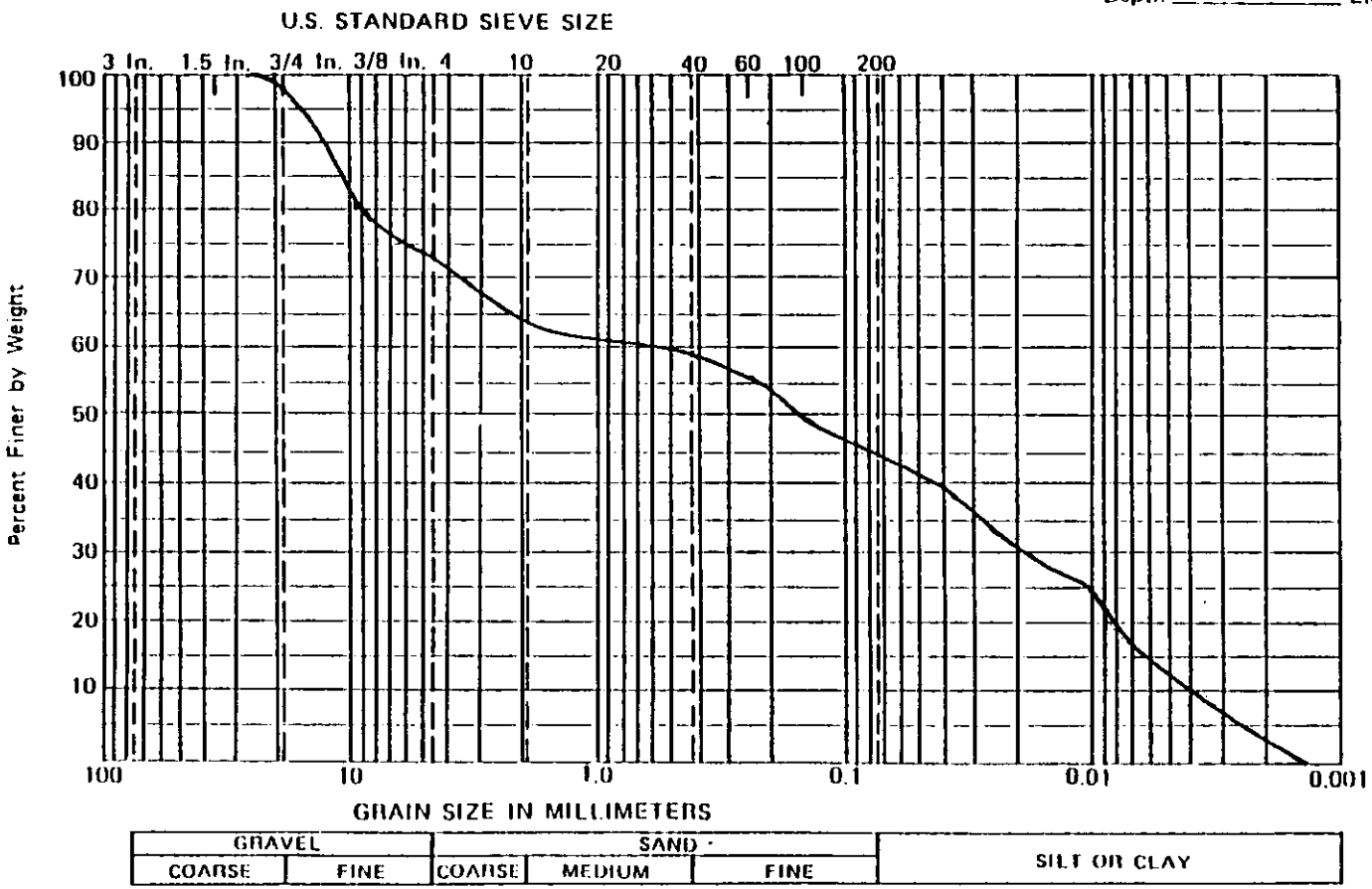


Figure 3-7

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilion

Boring No. IL-2 Sample No. 2

Depth 4.5-6.5 Elevation _____

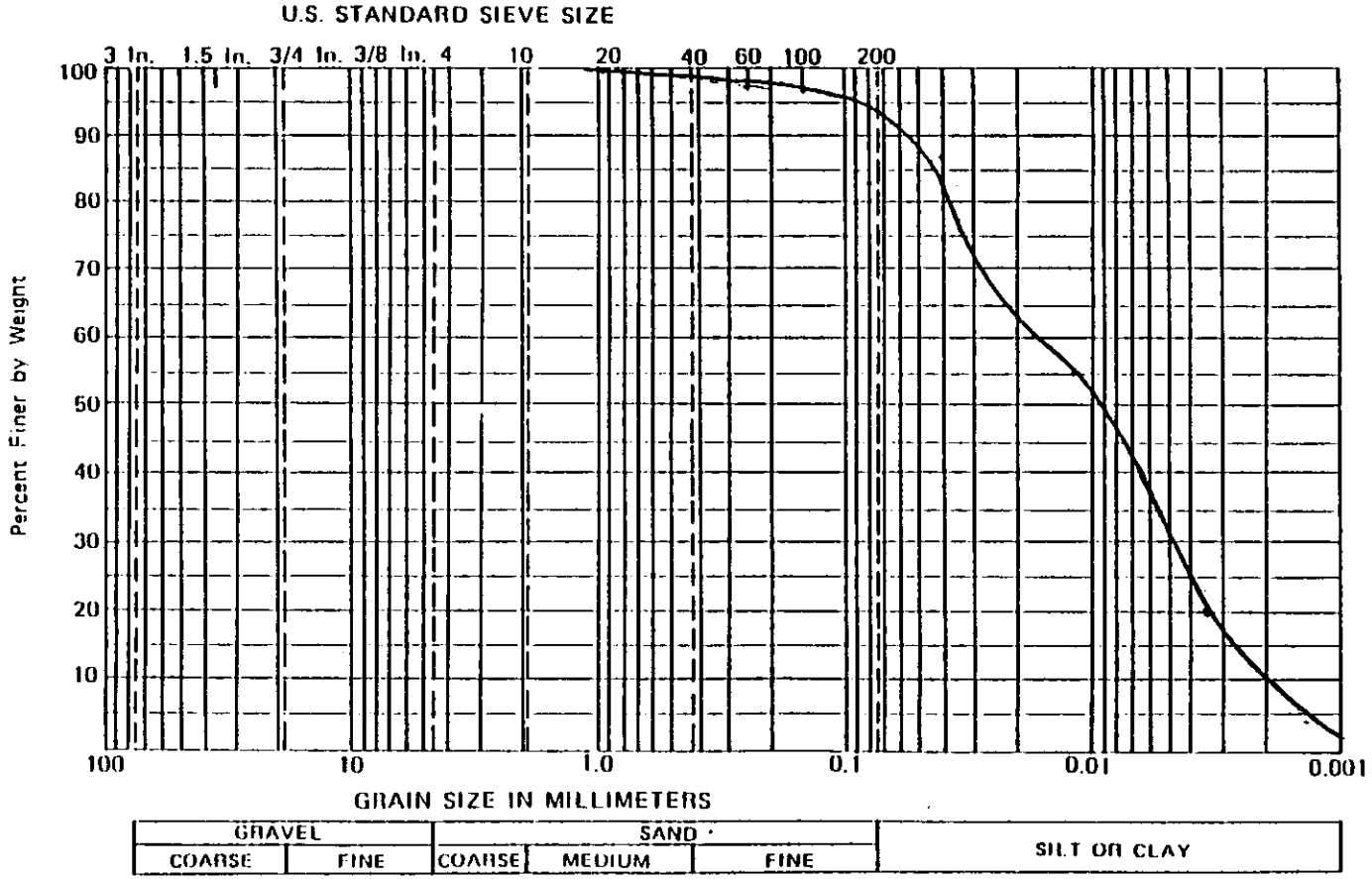


Figure 3-8

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilion

Boring No. IL-2 Sample No. 3

Depth 9.5-11.5 Elevation

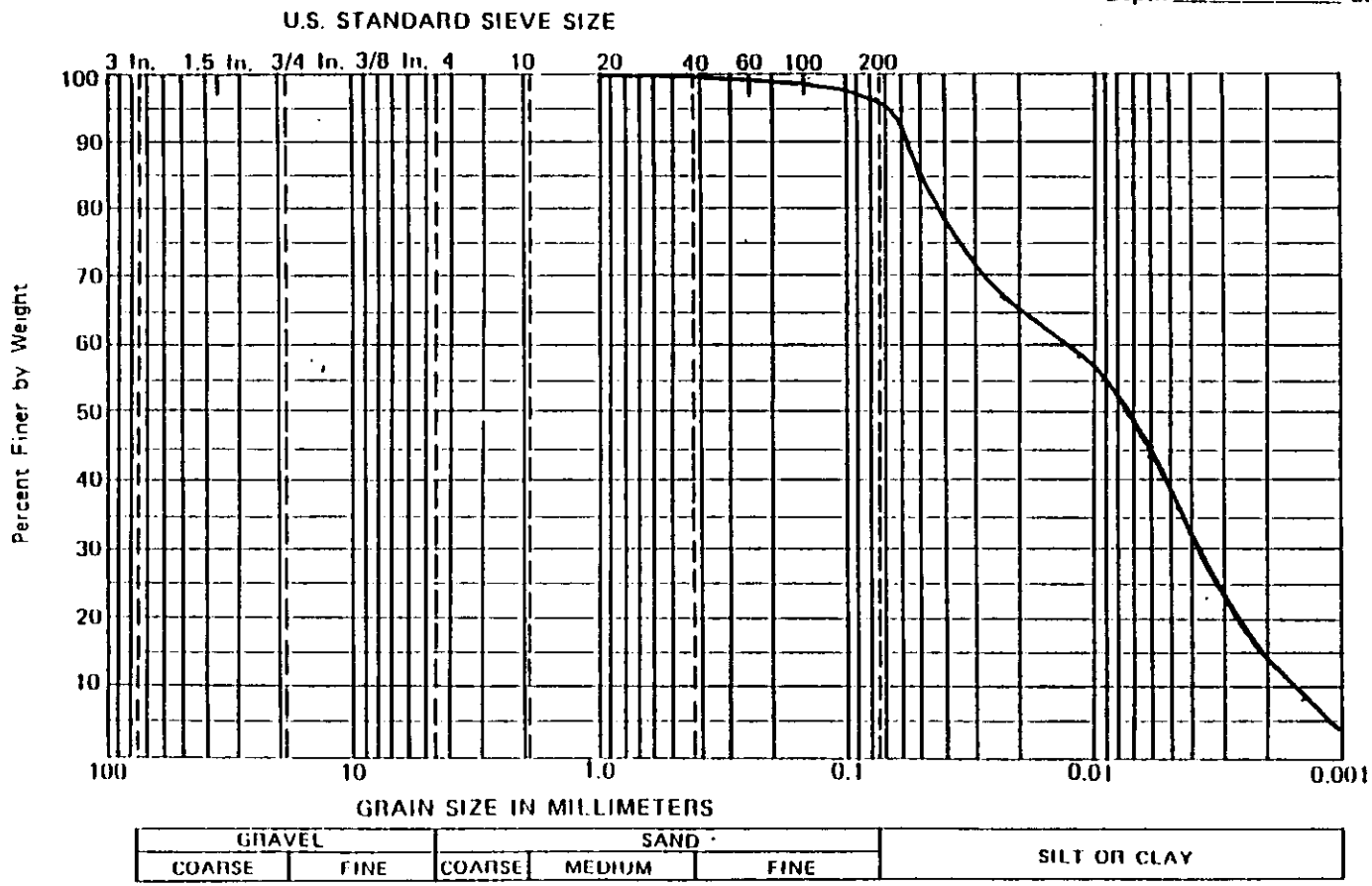


Figure 3-9

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilion

Boring No. IL-2 Sample No. 4

Depth 14.5-16.5 Elevation

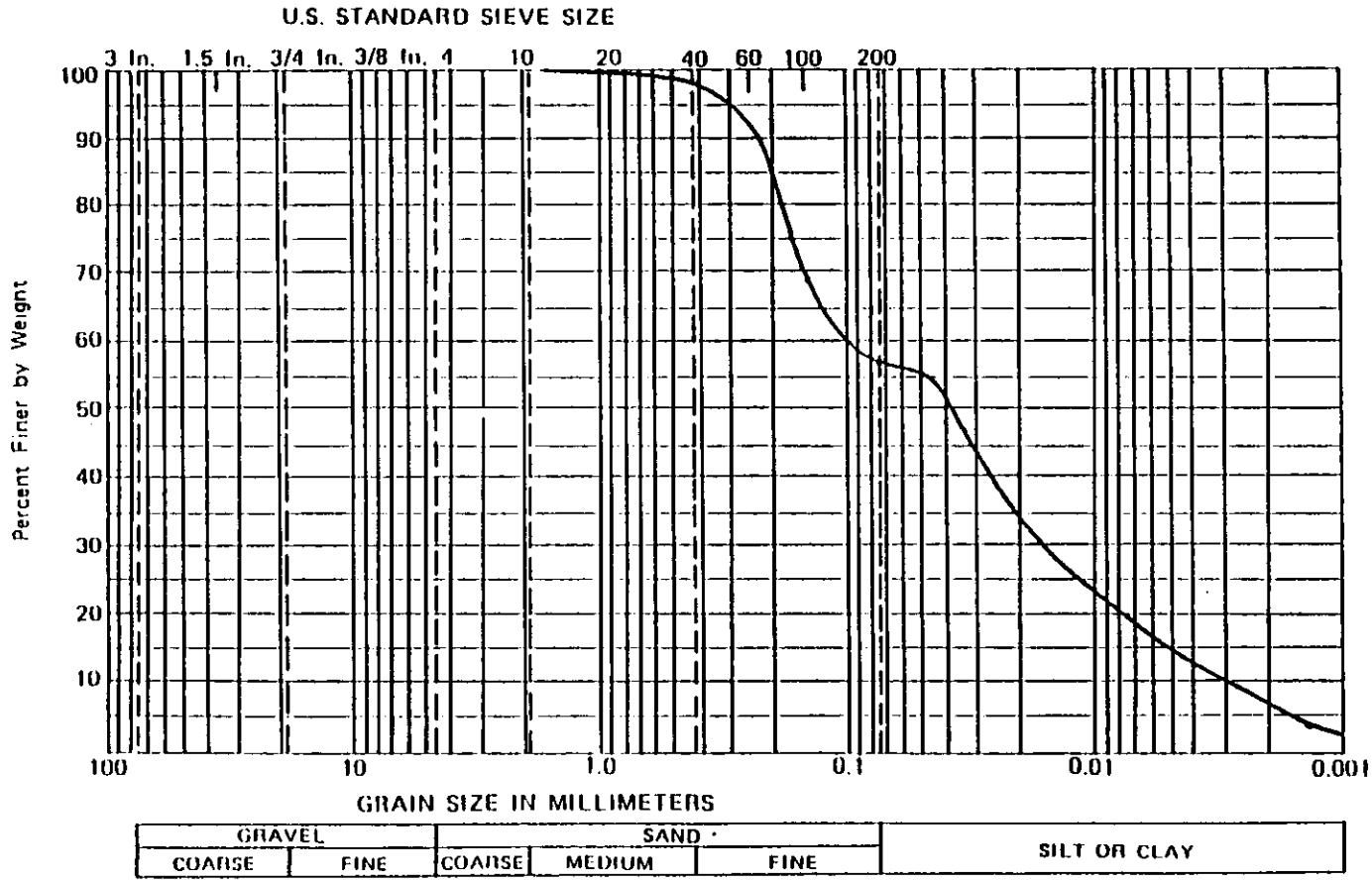


Figure 3-10

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilion

Boring No. IL-3 Sample No. 2

Depth 4.5-6.5 Elevation

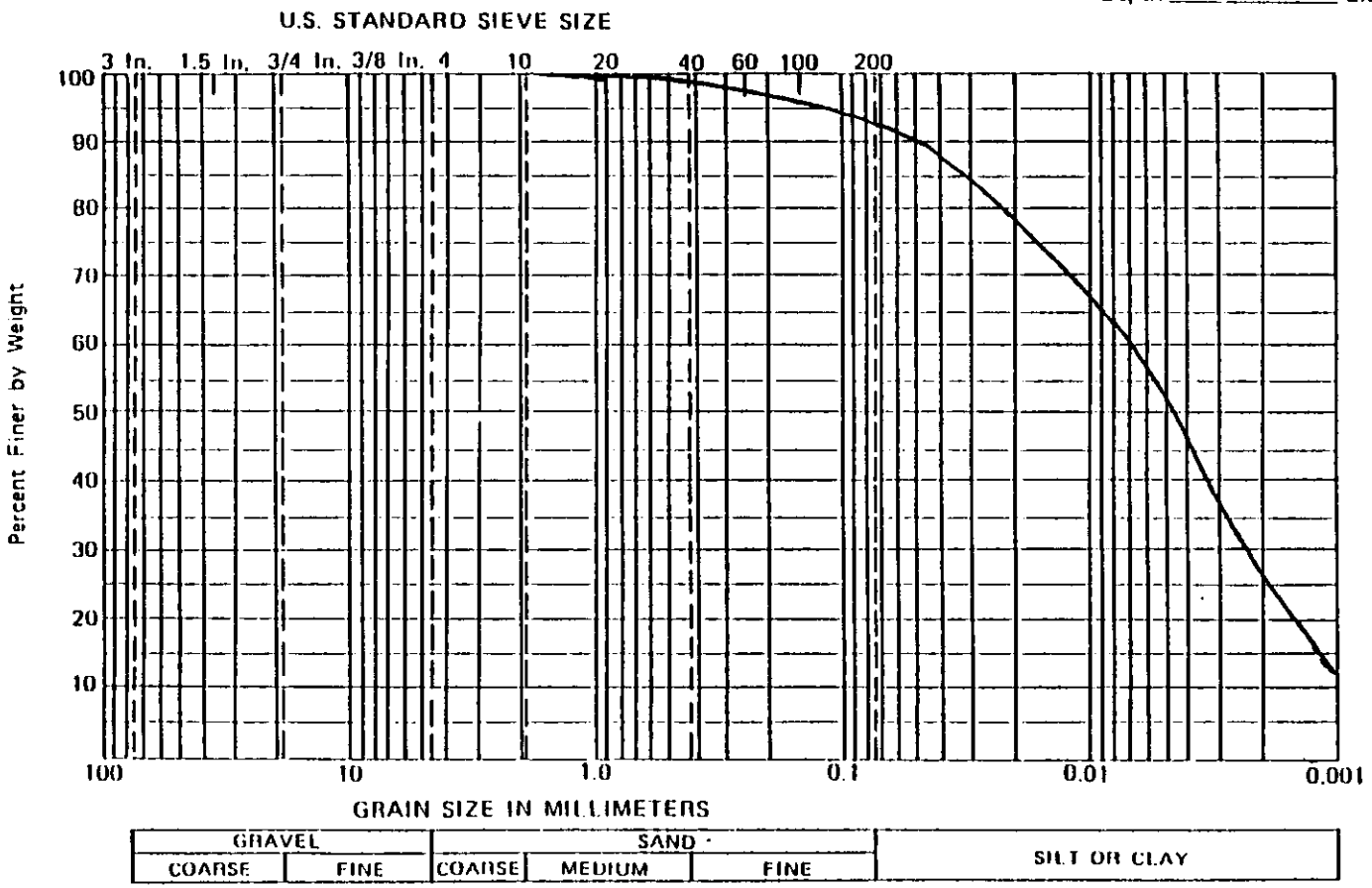


Figure 3-11

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilion

Boring No. IL-3 Sample No. 3

Depth 9.5-11.5 Elevation

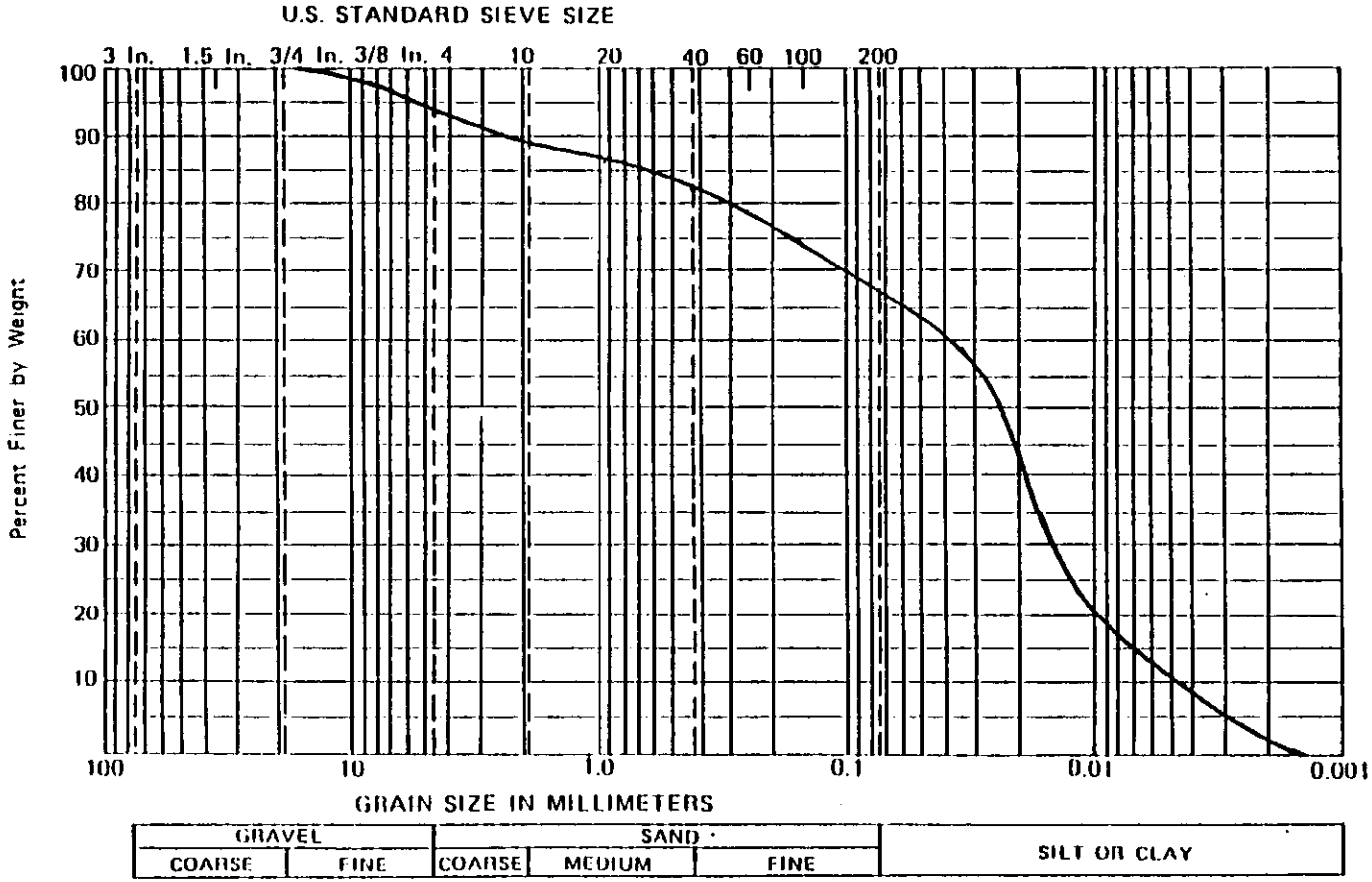


Figure 3-12

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION CURVE

Project Ilian

Boring No. IL-3 Sample No. 4

Depth 14.5-16.5 Elevation

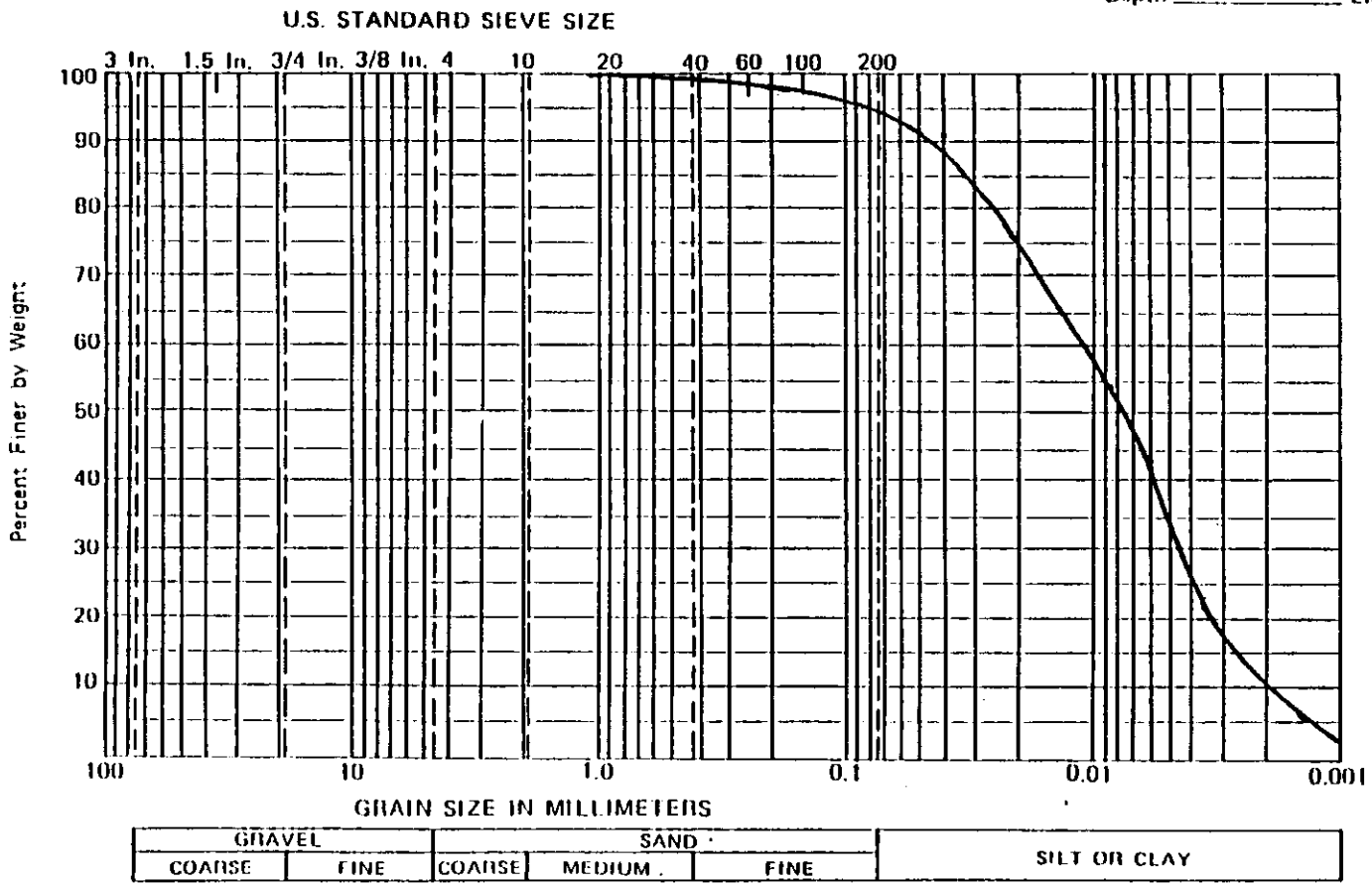
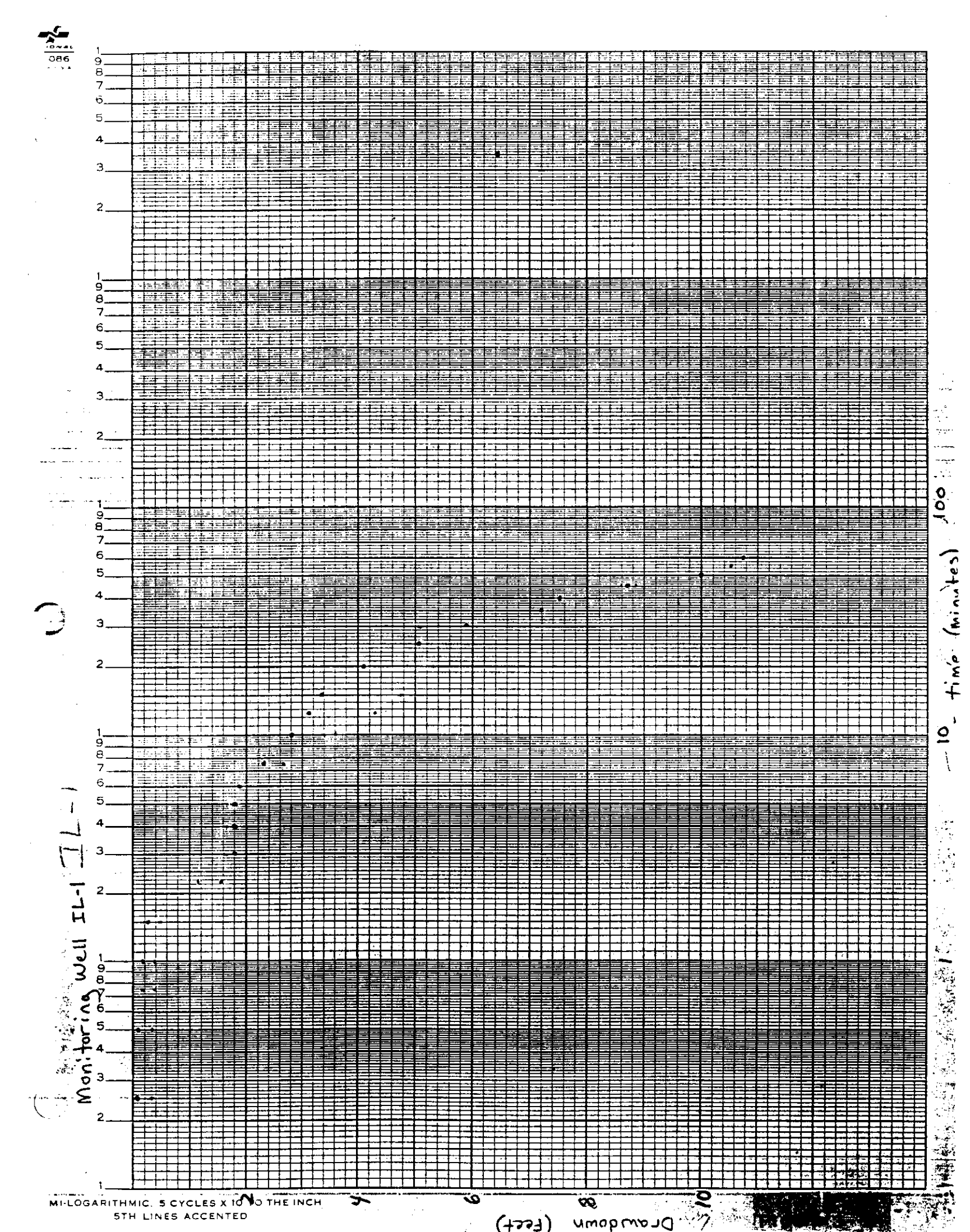


Figure 3-13


086
Monitoring Well IL-1 TL-1
Drawdown (Feet)
10 - time (Minutes) 100
MI-LOGARITHMIC. 5 CYCLES X 10 TO THE INCH
5TH LINES ACCENTED

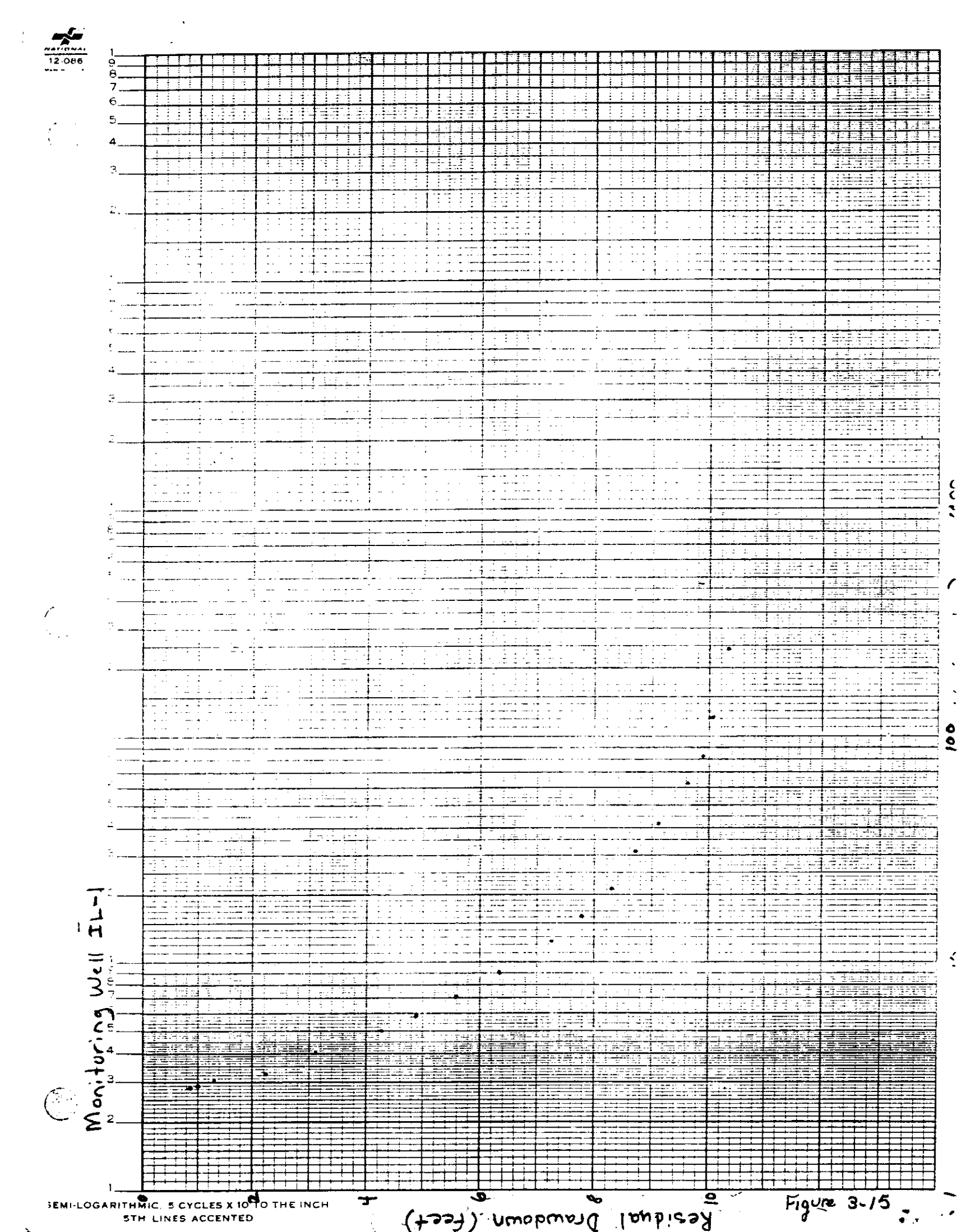

NATIONAL
12-086
Monitoring Well IL-1
Residual Drawdown (feet)
SEMI-LOGARITHMIC, 5 CYCLES X 10 TO THE INCH
5TH LINES ACCENTED

Figure 3-15

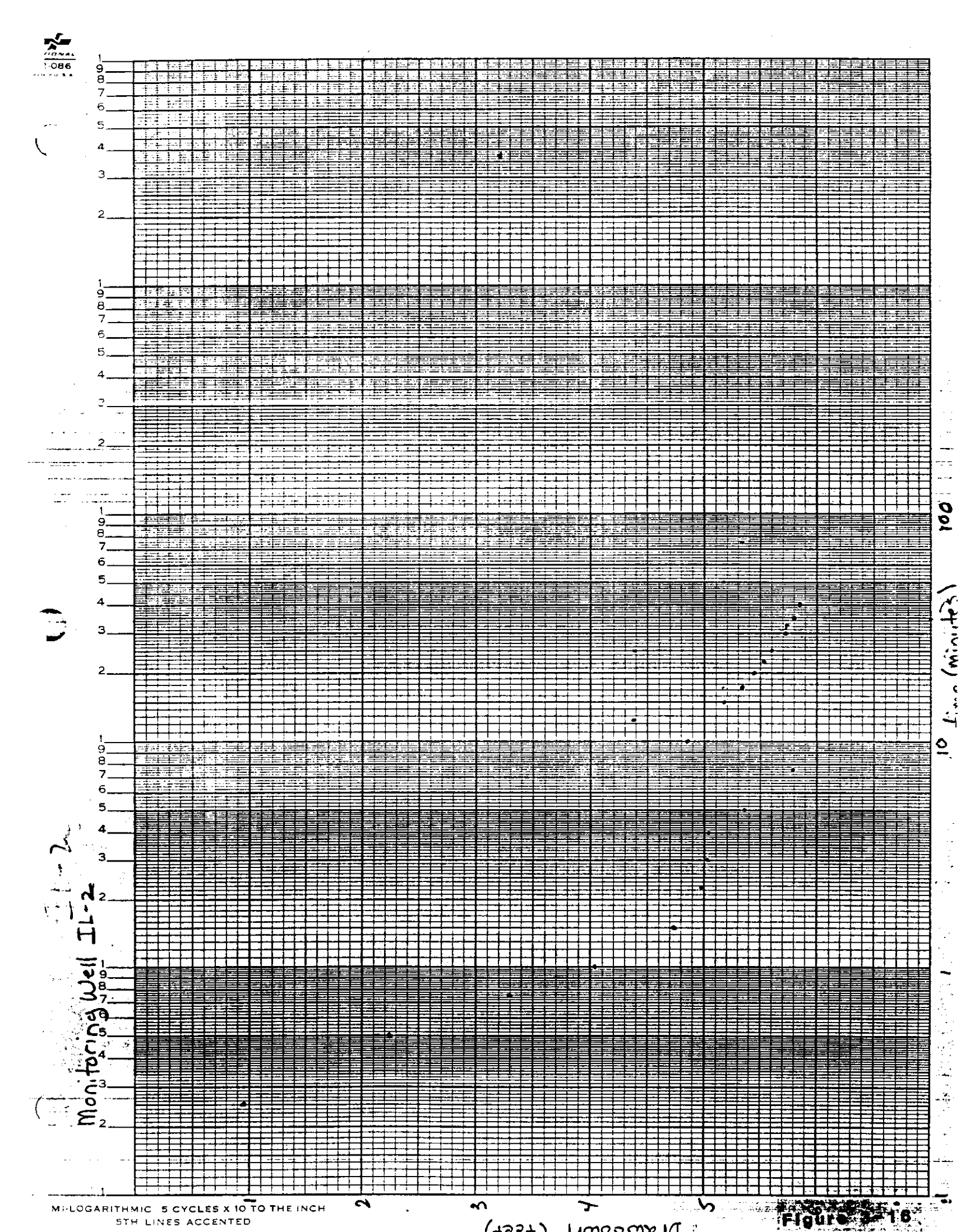

Monitoring Well IL-2
10 time (minutes) 100
MI-LOGARITHMIC 5 CYCLES X 10 TO THE INCH
5TH LINES ACCENTED

Figure 3-16

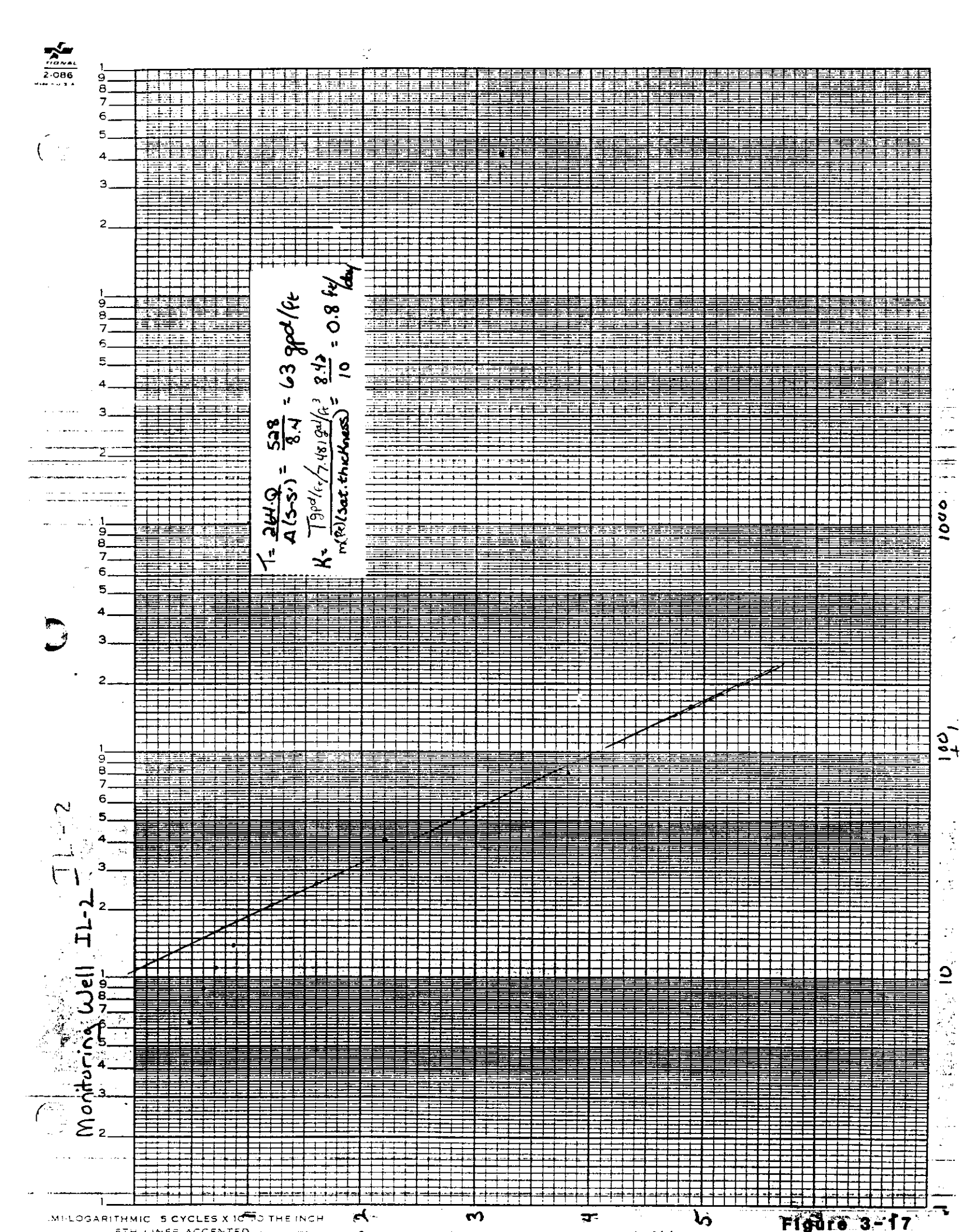

$T = \frac{264 \cdot Q}{\Delta(s-s')} = \frac{528}{8.4} = 63$ gpd/ft
$K = \frac{T_{gpd/ft}/7.481\ gpd/ft^3}{m(ft)\,sat.thickness} = \frac{8.4_2}{10} = 0.8$ ft/day
Monitoring Well IL-2
1000
100
10
1
MI-LOGARITHMIC 5 CYCLES X 10 TO THE INCH

Figure 3-17

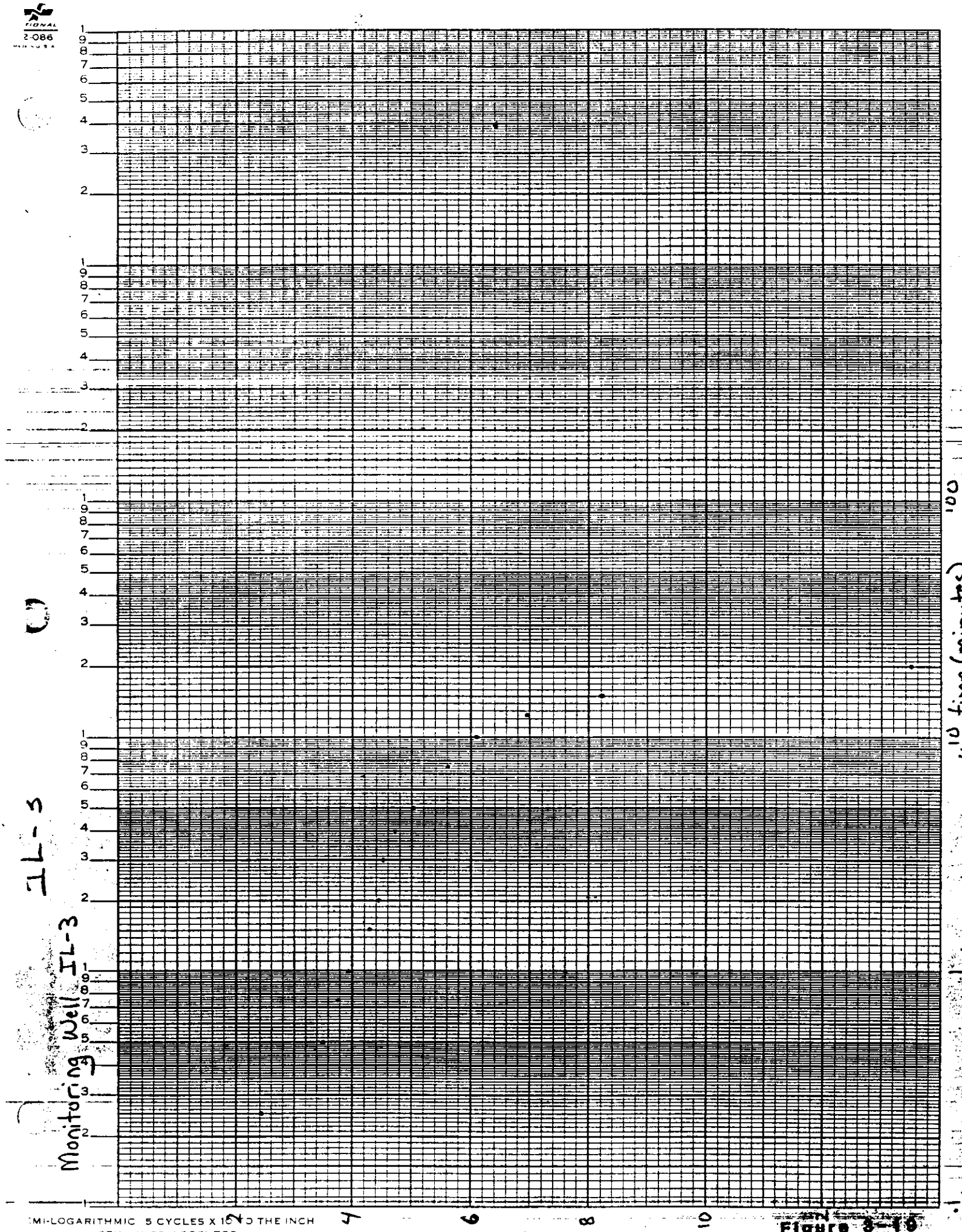

Monitoring Well IL-3
IL-3
time (minutes)
SEMI-LOGARITHMIC 5 CYCLES X 10 TO THE INCH
EIGHTH LINES ACCENTED

Figure 3-10

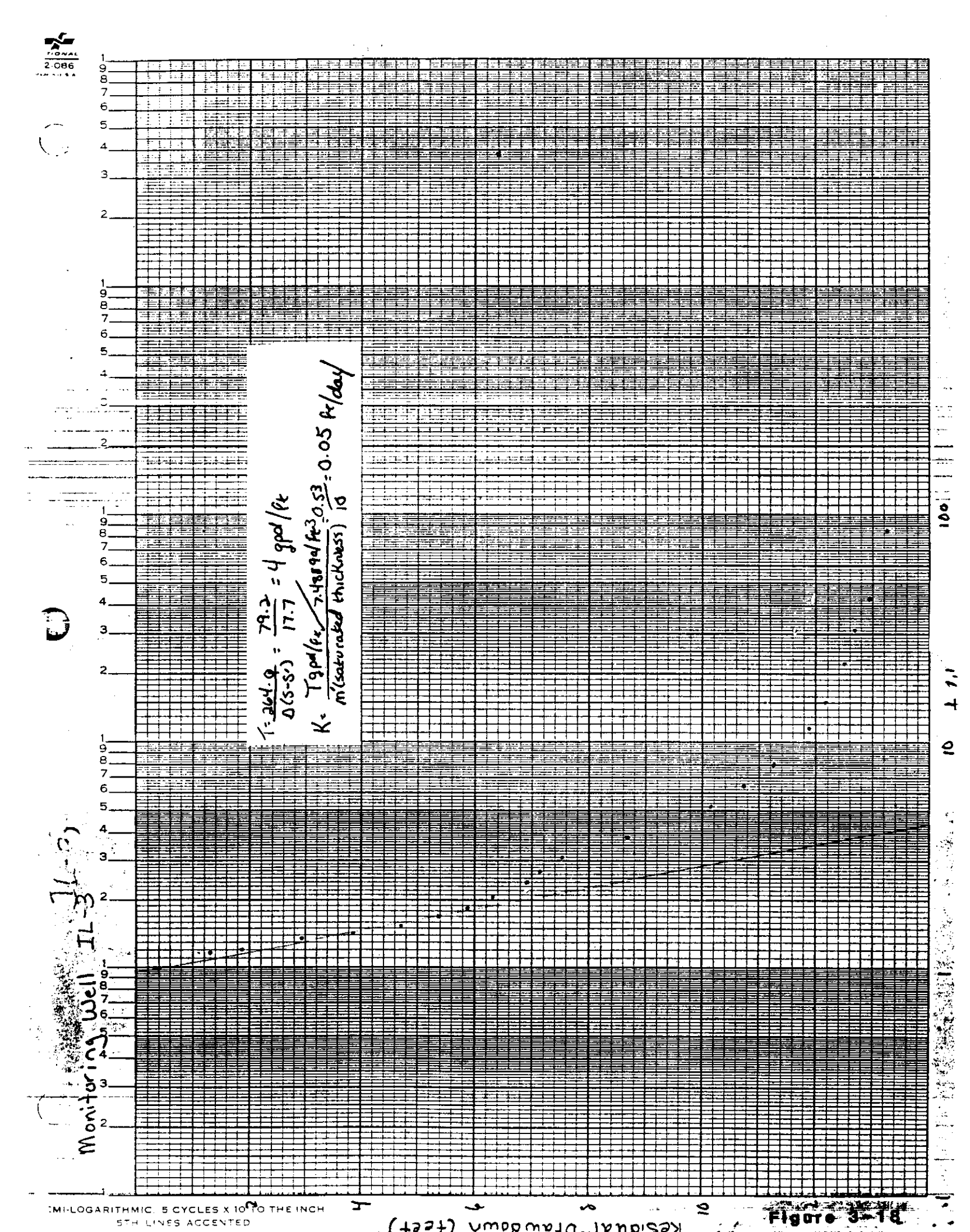

Monitoring Well IL-3 (1-2)
T = 264.9 / Δ(S-S') = 79.2 / 17.7 = 4 gpd/ft
K = T gpd/ft / 7.48 gal/ft³ / 0.53 / m'(saturated thickness) / 10 = 0.05 ft/day
SEMI-LOGARITHMIC, 5 CYCLES X 10 TO THE INCH
5TH LINES ACCENTED
Residual Drawdown (feet)

Figure 3-18

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Ilion

Well No: IL-1 Gauge Date: _____ Time: _____

Weather: Overcast, cool ~ 40°F drizzle

Well Condition: locked, no evidence of tampering.
no cracks in ~~cement~~ cement around casing.

Well Diameter (inches): 2" PVC well in 7" boring hole

Odor (describe): no odor (flow not working due to rain)

Sounding Method: — Measurement Reference: Top of PVC / Ground Surface

Well Depth (ft): 15.81' / 14 (1) Purge Date: 11/12/85 Time: 1225

Depth to Liquid (ft): — (2) Purge Method: centrifugal pump

Depth to Water (ft): 3.74' / 1.93' (3) w/ ½" poly tubing

Liquid Depth, (2)-(1): 12.07' (4) Purge Rate (gpm): ¾ @ 2 gpm

Liquid Volume, (4)xF (gal): ≈ 24.14 (5) Purge Volume (gal): 10½

Did Well Pump Dry?, Describe: yes water silty started to clear
well dry after 8½ gal. Waited 15 mins. pumped 2 gal.

Samplers: Tom Porter / Ellen Bidwell

Sampling Date: 11/13/85 Time: 0920

Sample Type: GW Split? No With Whom? _____

Comments and Observations: All bailers clear, Spec. Cond 300

Conversion: Liquid Depth to Volume

Well Diameter	Gallon/Ft (F)
2"	0.163
4"	0.653
6"	1.47
8"	2.61
12"	5.87

Converstion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

Figure 5-1. Field record of well gauging, purging and sampling.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Ilion

Well No: IL-2 Gauge Date: — Time: —

Weather: Overcast cool, ~40°F occassional drizzle

Well Condition: locked. No evidence of tampering near bore hole and cracks in cement grout, standing water near hole

Well Diameter (inches): 2" PVC well in 7" bore hole

Odor (describe): no odor (Hnu=0.6 bg; 0.6 over well)

Sounding Method: — Measurement Reference: Top of PVC / Ground Surface

Well Depth (ft): 17.7'/16' (1) Purge Date: 11/12/85 Time: 1145

Depth to Liquid (ft): ____ (2) Purge Method: centrifugal pump w/

Depth to Water (ft): 3.55/1.85' (3) 1/2" poly tubing

Liquid Depth, (2)-(1): 14.15 (4) Purge Rate (gpm): 4

Liquid Volume, (4)xF (gal): 7.07 (5) Purge Volume (gal): 28

Did Well Pump Dry?, Describe: no, pumped well with valve almost wide open, slightly cloudy. moved tubing up trough water column

Samplers: Tom Porter / Ellen Bowell

Sampling Date: 11/13/85 Time: 0545 hrs.

Sample Type: GW Split? No With Whom? ____

Comments and Observations: all bailer clean. HNu bg=0.0, over well = 5.0 Spec. Cond. = 679

Conversion: Liquid Depth to Volume

Well Diameter	Gallon/Ft (F)
2"	0.163
4"	0.653
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

Figure 5-1. Field record of well gauging, purging and sampling.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Ilion

Well No: IL-3 Gauge Date: _____ Time: _____

Weather: Overcast cool ~40°F drizzle

Well Condition: Well locked, no evidence of tampering, base of well casing underwater w/ crack in outer grout, good bond of grout.

Well Diameter (inches): 2" PVC well in 7" bore hole

Odor (describe): Sulfur Smell.

Sounding Method: — Measurement Reference: Top PVC / ground surface

Well Depth (ft): 18.28/14' (1) Purge Date: 11/12/85 Time: 1300 hrs.

Depth to Liquid (ft): — (2) Purge Method: centrifugal pump w/

Depth to Water (ft): 4.73/-.55 (3) ½" poly tubing

Liquid Depth, (2)-(1): 14.55' (4) Purge Rate (gpm): 1.5

Liquid Volume, (4)xF (gal): ~~23.29~~ (5) Purge Volume (gal): 9 gals

Did Well Pump Dry?, Describe: Yes, pumped 6¾ gal. after ~ 6 min. waited 15 min. pumped another 2¼ gal. with clear.

Samplers: Tom Porter / Ellen Bidwell

Sampling Date: 11/13/85 Time: 1050 hrs.

Sample Type: G.W. Split? No With Whom? _____

Comments and Observations: HNU = 4.8 background, 4.8 over well, all bailers come out clear; Spec. cond. = 330

Conversion: Liquid Depth to Volume

Well Diameter	Gallon/Ft (F)
2"	0.163
4"	0.653
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

Figure 5-1. Field record of well gauging, purging and sampling.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Ilion L.F.

Well No: IL-1 Gauge Date: 4-21-87 Time: 0830

Weather: Sunny warm ~ 70° F.

Well Condition: Locked secure. Grout seal in good Condition.

Well Diameter (inches): 2" well in 7" borehole

Odor (describe): None

Sounding Method: OED Measurement Reference: Top of PVC

Stick up/down (ft): 1.80

(1) Well Depth (ft): 17.7' Purge Date: 4-21-87 Time: 0840

(2) Depth to Liquid (ft): 10.04 Purge Method: Centrifugal pump

(3) Depth to Water (ft): 10.04 Purge Rate (gpm): 1.5 gpm

(4) Liquid Depth [(1)-(2)]: 7.66 Purge Time (min): _____

(5) 1 Borehole Liquid Volume [(4)xF] (gal): 4.75 Purge Volume (gal): 3.5 gal.

Did Well Pump Dry? Describe: Well pumped dry ~~quickly~~ quickly Allow to recharge 15 min. pump dry again.

Samplers: Lori Rogers / Tom Porter

Sampling Date: ~~4-21-87~~ 4-21-87 Time: 1050 hrs.

Sample Type: Grab Teflon Bailer. Split? No. With Whom: _____

Comments and Observations: Spec. Cond. 2700

FIGURE 3-23

*Conversion: Liquid Depth to Volume

Well Diameter	Gallon/ft
2"	0.16
4"	0.65
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1		.08	5		.42	9		.75
1	1/2	.12	5	1/2	.46	9	1/2	.79
2		.16	6		.50	10		.83
2	1/2	.21	6	1/2	.54	10	1/2	.87
3		.25	7		.58	11		.91
3	1/2	.29	7	1/2	.62	11	1/2	.95
4		.33	8		.56			
4	1/2	.37	8	1/2	.70			

* Multiply liquid depth by gallons/ft.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Ilion L.F.

Well No: IL-2 Gauge Date: 4-21-87 Time: 0950 hrs.

Weather: Sunny ~ 75°F

Well Condition: Well Locked. Lock ~~bore~~ key hole damaged-had to use bolt cutters to remove lock. (Replaced lock) Grout seal in good condition

Well Diameter (inches): 2" well in 7" borehole

Odor (describe): None no HNu reading above bkg.

Sounding Method: OED Measurement Reference: Top of PVC

Stick up/down (ft): 1.71

(1) Well Depth (ft): 16.28' Purge Date: 4-21-87 Time: 0955 hrs.

(2) Depth to Liquid (ft): 6.41 Purge Method: Centr. fugal pump.

(3) Depth to Water (ft): 6.41 Purge Rate (gpm): 2.5 gpm

(4) Liquid Depth [(1)-(2)]: 9.87 Purge Time (min): 10

(5) ∧ Liquid Volume [(4)xF] (gal): 6.1 Purge Volume (gal): 25 gal. 1 Borehole

Did Well Pump Dry? Describe: No.

Samplers: Lori Rogers / Tom Porter

Sampling Date: 4-21-87 Time: 1010 hrs.

Sample Type: Grab Split? No. With Whom:

Comments and Observations: Teflon Bailer All bailers clear. Spec Cnd. 900.

FIGURE 3-24

*Conversion: Liquid Depth to Volume

Well Diameter	Gallon/ft
2"	0.16
4"	0.65
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1	.08	5	.42	9	.75
1 1/2	.12	5 1/2	.46	9 1/2	.79
2	.16	6	.50	10	.83
2 1/2	.21	6 1/2	.54	10 1/2	.87
3	.25	7	.58	11	.91
3 1/2	.29	7 1/2	.62	11 1/2	.95
4	.33	8	.56		
4 1/2	.37	8 1/2	.70		

* Multiply liquid depth by gallons/ft.

FIELD RECORD OF WELL GAUGING, PURGING AND SAMPLING

Site: Ilion L.F.

Well No: IL-3 Gauge Date: 4-21-87 Time: 1100 hrs.

Weather: Sunny hot ~ 80°F

Well Condition: locked, secure standing water at ground surface. Grout is cracked

Well Diameter (inches): 2" well in 7" borehole

Odor (describe): no odor or HNu reading above bkg.

Sounding Method: QED Measurement Reference: Top of PVC

Stick up/down (ft): 1.55'

(1) Well Depth (ft): 15.81 Purge Date: 4-21-87 Time: 1120 hrs.

(2) Depth to Liquid (ft): 1.69 Purge Method: Centrifugal pump

(3) Depth to Water (ft): 1.69 Purge Rate (gpm): 2 gpm

(4) Liquid Depth [(1)-(2)]: 14.12 Purge Time (min): ~4 min.

(5) Liquid Volume [(4)xF] (gal): 8.72 Purge Volume (gal): 8.5 gal.

Did Well Pump Dry? Describe: Well pumped dry after 6 gal. initial discharge cloudy blk. cleared after 2 gal. Allowed to recharge 15 min. pumped dry Ag Adn.

Samplers: Lori Rogers / Tom Porter.

Sampling Date: 4-21-87 Time: 1140 hrs.

Sample Type: Grab Teflon Bailer Split? NO. With Whom:

Comments and Observations: All bailers clear. Spec. Cond. 610

FIGURE 3-25

*Conversion: Liquid Depth to Volume

Well Diameter	Gallon/ft
2"	0.16
4"	0.65
6"	1.47
8"	2.61
12"	5.87

Conversion Inches to Fractional Feet

1		.08	5		.42	9		.75
1	1/2	.12	5	1/2	.46	9	1/2	.79
2		.16	6		.50	10		.83
2	1/2	.21	6	1/2	.54	10	1/2	.87
3		.25	7		.58	11		.91
3	1/2	.29	7	1/2	.62	11	1/2	.95
4		.33	8		.56			
4	1/2	.37	8	1/2	.70			

* Multiply liquid depth by gallons/ft.

4. SITE ASSESSMENT - ILION LANDFILL

4.1 SITE HISTORY

The Ilion landfill is an inactive open dump located at the end of East Street in the Village of Ilion, Herkimer County, New York. The site is owned by the Village of Ilion, and was used between 1933-1971 for the disposal of municipal wastes (Appendix 1.4.1-1). Wastes from Remington Arms and other local industries were reportedly also dumped at the site. An onsite incinerator was used to burn waste.

In a statement made by a plant operator in charge of the dump area, Mr. Charles Wilson, it was indicated that the original owners of the land, Remington Rand Company, operated an open incinerator to dispose of garbage and burnable material. They reportedly burned varnaline, oil, lacquer, and paper in this pit while all of the non-combustible trash was dumped to the right and left of the dump entrance. The old Rand burn pit was located west southwest of the Ilion landfill and now over which there is a school. Mr. Wilson also stated that once owned by the Village of Ilion, all dangerous materials (oil and lacquer) received were destroyed and no longer remain at the site (Appendix 1.4.1-2). In a report prepared by the NUS Corporation for the U.S. EPA, deteriorating drums were observed during their site inspection. A statement made by the Superintendent of the Public Works, Mr. James Rowland (Appendix 1.4.1-3) and Mr. Charles Wilson (Appendix 1.4.1-2), indicate that these drums were used by construction crews to block off areas of demolition, and were

empty at the time of disposal. During EA's site reconnaissance, such drums were observed only in one area located in the eastern portion of the site (Figure 1-2).

In 1980, the Village of Ilion proposed to install recreational facilities on the site. As a result, ground water was sampled. Six priority pollutant metals were detected, yet levels were not considered significant enough to deter the installation of ballfields and tennis courts. The New York State Department of Environmental Conservation (NYSDEC) indicated that the contaminant concentrations would not pose any significant environmental hazards (Appendix 1.4.1-4).

4.2 SITE TOPOGRAPHY

The Ilion landfill covers an area approximately 25 acres in size. The site is bordered by the Mohawk River/Barge Canal to the north, wetlands to the east and west, and residential property to the south. The site is split by an access road built over an old railroad bed which runs parallel to the Mohawk River.

The old incinerator is located in the north section. Trash and ash were built up about 5-10 ft from the flood-plain of the river both to the east and west of the incinerator. The east section is hummocky and wooded, and the area closer to the incinerator is the more recent disposal area. The west section is partly wooded and is presently being used by the Ilion Department of Public Works (DPW) to dump leaves and street cleaning debris.

The south section is an area of public activity for recreational purposes. A softball field and tennis courts were constructed in the southwest corner behind the DPW buildings. There is another ballfield and a pool in the southeast corner (Figure 1-2).

The site is nearly flat, and slopes only slightly to the north. The nearest downgradient surface water is located adjacent to the site (Figure 1-2): (1) the Mohawk River/barge canal flows eastward and is located immediately north of the site, and (2) a freshwater wetlands is located immediately east of the site. The river/canal is controlled by flow structures which create large local seasonal variations in the water level. A small stream along the northeast edge of the landfill connects the eastern wetlands with the river via a culvert beneath the old railroad grade. The storm drain ditch located just east of the Town's DPW buildings is also connected to the river via a culvert beneath the old railroad grade. It is alleged that this storm drain extended south to an old (no longer in existence) coal gasification facility where tarry wastes were discharged. The nearest residence is located adjacent to, and south of the site. The nearest offsite commercial building is located approximately 1,000 ft south of the site boundary. The nearest public well is located approximately 4,400 ft east of the site boundary.

Under EA supervision, three monitoring wells (IL-1, IL-2, and IL-3) were installed at the site. Two downgradient wells are located in the north section, IL-1 west and IL-2 east of the incinerator. The upgradient well, IL-3, is located in the southeast corner (refer to Figure 3-1 Locations).

4.3 HYDROGEOLOGY

The site is located in the Mohawk River lowlands, which is the area within the Mohawk River Valley underlain by glaciofluvial deposits and by lacustrine and alluvial deposits. The sediment comprising most of the valley fill was carried in by glacial melt water and deposited in standing bodies of water. These were later overlain by a veneer of flood-plain deposits of the Mohawk River. The sediments are predominantly fine sand, silt, and clays, but are interstratified in places with beds and lenses of coarser sand and gravel. The unconsolidated deposits are underlain by the Ordovician Age Utica Shale. In the vicinity of Frankfort Village (approximately 2 mi west of site), bedrock is at least 150 ft below ground surface (Appendix 1.4.3-1).

Test borings/observation wells (IL-1, IL-2, and IL-3) installed during the Phase II investigation (Figure 3-1) indicate that the site adjacent to the Mohawk River is directly underlain by alluvial deposits of clay, silt, and fine sand to a depth of 15 ft. In Boring/Well IL-2, a lens of sand was encountered at a depth of 15-17 ft. Boring/Well IL-3, adjacent south of the site, indicated alluvial deposits of silt, clay, and fine sand deposited in a swampy environment (freshwater shells and peat were encountered).

The borings/wells were completed in unconsolidated sediment and screened in the upper portion of the first ground water encountered. All of the borings were completed to depths between 15-17 ft below ground surface. Boring logs and grain size analysis are provided in Figures 3-2 to 3-13.

Based upon the elevation of the water table when measured in the three Phase II monitoring wells, ground-water flow is northeast towards the Mohawk River, though the water table is relatively flat and shallow. The ground-water level is only slightly higher than the adjacent river, ranging from depths of 0-10 ft below grade. The ground-water level fluctuates, as indicated on Table 3-1, depending on the Mohawk River level, which in the area of the site is joined with the Barge Canal and controlled seasonally by locks. The first three ground-water measurements (July, October, and November 1985), shown on Table 3-1, were obtained during times when the locks were closed and the river level was high. The fourth ground-water measurement (April 1987) was obtained when the locks were open and the river level was low, resulting in ground-water levels that are 3-6 ft lower than the other measurements at IL-1 and IL-2. The ground-water level at IL-3 (located approximately 1,500 ft south of the river) does not appear to be directly effected by substantial changes in the river level.

The geophysical surveys performed during the Phase II investigation located several anomalous zones, interpreted as areas of possible subsurface contamination (Appendix 1.3.2-1). A large extent of the survey area was affected by external interferences. A description of such interferences is provided in Appendix 1.3.2-1, Plate 1). The two downgradiant boring/observation wells were located within such interpreted subsurface anomalous zones.

The short-term, low-yield pump test results (Table 4-1) reflect the poor hydraulic character of the fine sediments underlying the site, with the exception of Well IL-2, which screens the upper 2 ft of a sand lens. Calculations of transmissivity (T) and permeability (K) are based on the Jacob's modification of the Theis equation (Appendix 1.4.3-4).

Because the potential exists for connection between the very fine-grained sediments encountered immediately beneath the site and both the unconsolidated sand and gravel deposits and the bedrock, the aquifer of concern is considered to be the unconsolidated sand and gravel deposits located in the Mohawk River lowland deposits and the underlying Utica Shale bedrock. However, most of the ground water in the immediate vicinity of the site probably discharges directly to the Mohawk River due to its proximity, as indicated by water level measurements in the three wells.

An estimated population of 9,557 is served by ground water from the aquifer of concern. The Village of Ilion's public water is supplied by surface water from creeks south and upgradient of the site. No private wells are allowed within the village limits. The Village of Mohawk has a public water supply well approximately 1 mi east of the site, which serves 3,300 people. The well is screened in a sand and gravel deposit 52 ft below ground surface (Appendix 1.4.3-2). The Village of Frankfort wells are approximately 2.5 mi west of the site, and are screened in a sand and gravel deposit that serves 4,325 people (Appendix 1.4.3-3). There are numerous private homes served by private wells in the 3-mi radius of the site. Herkimer Village is in the 3-mi radius but is served by surface water from outside the 3-mi radius.

4.4 SITE CONTAMINATION

Waste Types and Quantities

The site received municipal waste from the Village of Ilion, which included wastes from Remington Arms and other local industries. As a result of EA's record search, no information was found in various files of pertinent agencies (Appendix 1.3.1-1) which could document that hazardous wastes were disposed at the site.

Ground Water

On 27 November 1979, a sample of water was collected during the dewatering operations related to the construction of the new sewer trunk line across the site. The sample location was somewhere midway between the DPW garage and the incinerator, in the vicinity of the access road and the outlet of the storm drain. Levels of benzene (1 ppb), toluene (20 ppb), and xylene (10 ppb), as well as lead (0.1 ppm) and iron (7.8 ppm) were detected (Appendix 1.4.4-1). An upgradient sample was not collected for comparison with ambient conditions. Also, sample collection and handling methods are unknown.

In 1980, ground water was sampled from a boring in the recreational area west of the DPW garage. Phenols, chromium, lead, iron, and cadmium were detected above New York State Water Quality Standards for Class GA water. The samples were also analyzed for toluene, xylene, and benzene, however, these compounds were not detected (Appendix 1.4.4-2). Again, an upgradient sample was not collected for comparison with ambient conditions, and sample collection and

handling methods are unknown. The NYSDEC evaluated the results and determined the contaminant concentration did not indicate that any significant environmental hazard will be created by the construction of the Ilion Community Park. The results were not evaluated for possible health effects or health implication (Appendix 1.4.1-4).

Three ground-water samples (one from each Phase II monitoring well) were collected on 13 November 1985 during the Phase II investigation and analyzed for the organic compounds and inorganic parameters of the HSL. (Due to missed holding times, ground water was sampled on 21 April 1987 and analyzed for pesticides and PCB's of the HSL.) There is no significant increase in the concentration of any parameter between the upgradient and downgradient samples. In order to confirm a release of contaminants from the site for the purpose of HRS, there must be a significant increase in the concentration of some chemical parameter between ambient conditions and downgradient of the site. U.S. EPA considers a significant increase to be at least a 10-fold increase if one contaminant is detected in both the upgradient and downgradient wells, a 5-fold increase if several contaminants are detected in both the upgradient and downgradient wells, and a 3-fold increase if the contaminant found in the downgradient well is below the detection limit in the upgradient well.

No organic volatiles were detected above the contract required detection limit (CRDL) in the Phase II ground-water samples. No semi-volatiles were detected that would indicate a release to ground water from the site. Of the two phthalates detected in the ground water and surface water, Bis(2-ethylhexyl) phthalate was also detected in the method blank, and diethy phthalate was detected in the upgradient sample only. Iron and manganese were detected at

elevated levels in samples from all the wells (refer to Table 4-2 for summary of analytical results of samples collected 13 November 1985 and 21 April 1987 at the Ilion landfill).

Surface Water

Two surface water samples were collected from the Mohawk River/Barge Canal (one upgradient and one downgradient of the site) on 13 November 1985 and 21 April 1987 during EA's Phase II investigation. No contaminants were detected at levels significantly different in the downgradient sample compared to the upgradient sample. A summary of analytical results for the surface water samples are provided in Table 4-2.

Soil

Two sediment samples were collected at the Phase II surface water sample locations on 13 November 1985. (Due to missed holding times, sediment samples were resampled on 21 April 1987 and analyzed for BNA, pesticides, and PCB's of the HSL.) Numerous organic and inorganic parameters were detected in both samples. However, the detected concentrations are all below contract required detection limits and not significantly higher downstream of the site versus upstream of the site (refer to Table 4-3 for a summary of analytical results for 13 November 1985 and 21 April 1987 sampling program).

Air

No data available.

TABLE 4-1 ILION LANDFILL: SUMMARY OF ESTIMATED AQUIFER CHARACTERISTICS

Well Number	Pump Rate GPM	Drawdown Phase			Residual Drawdown Phase	
		Transmissivity(T) gpd/ft	Permeability(K) ft/day	Specific Capacity gpm/ft	Transmissivity(T) gpd/ft	Permeability(K) ft/day
IL-1	.25	Well pumped dry in 60 minutes*	*	---	**	**
IL-2	2.0	*	*	0.2	63	8×10^{-1}
IL-3	.3	Well pumped dry in 20 minutes*	*	---	4	5×10^{-2}

* Pumping test too erratic to evaluate.
** Well recovered too slowly to calculate T and K.

NOTE: Calculations of transmissivity (T) and permeability (K) are based on Jacobs modification of the Theis equation.

TABLE 4-2 SUMMARY OF ANALYTICAL RESULTS* FOR ILION SITE FROM WATER SAMPLES COLLECTED 13 NOVEMBER 1985**

	Ground Water			Surface Water		Method Blank (Water) 16 NOV 1985	New York State Ground-Water Quality Standards Class GA***
	Downgradient IL-1	Downgradient IL-2	Upgradient IL-3	Upriver ISW-1	Downriver ISW-2		
Volatiles (ug/L)							
Methylene chloride		BCRDL	BCRDL			BCRDL	
Acetone	BCRDL	BCRDL	BCRDL	BCRDL	BCRDL		
2-Butanone				BCRDL		BCRDL	
Trichloroethene				BCRDL	BCRDL		
Toluene				BCRDL	BCRDL		
						BNA Blank 10 DEC 1985	
Semi-Volatiles (ug/L)							
Bis(2-ethylhexyl)phthalate	13B	BCRDL	BCRDL	110B	BCRDL	BCRDL	
Di-n-octyl phthalate	BCRDL	BCRDL					
Diethyl phthalate			18				
Metals (mg/L)							
Aluminum	.6	.3	<0.2	.3	.7		
Barium	.18	.14	.10	.03	.03		1.0
Cadmium	.0006	<0.0005	<0.0005	<0.0005	<0.0005		0.01
Calcium	260	100	110	40	40		
Chromium	.004	<0.001	<0.001	.002	.002		0.05
Copper	<0.005	.022	<0.005	.006	.007		1.0
Iron	20	20	4.1	.43	.58		0.3
Lead	<0.002	<0.002	<0.002	.002	<0.002		0.025
Magnesium	33	20	22	2.8	3.0		
Manganese	1.5	.80	.59	.05	.07		0.3
Potassium	<1.0	<1.0	<1.0	2	2		0.3
Sodium	17	14	11	9	11		

* The analytical program included the full Hazardous Substances List (HSL); however this summary includes only those parameters detected in at least one sample. Refer to Appendix 3 (bound separately) of this report for the full CLP package.

** Due to missed holding times for pesticides and PCB, all five locations were resampled by EA on 21 April 1987 for analysis of those compounds. No pesticides or PCB were detected.

*** NYCRR, Part 703.

NOTE: BCRDL = Detected below contract required detection limits.
BDL = Detected below detection limits (affected by dilution).

TABLE 4-3 SUMMARY OF ANALYTICAL RESULTS* FOR ILION SITE FROM SEDIMENT SAMPLES COLLECTED 13 NOVEMBER 1985 AND 21 APRIL 1987

	Soil		
	Upriver ISED-1	Downriver ISED-2	Method Blank (soil) 18 NOV 1985
Volatiles (ug/kg) (11-13-85)			
Methylene chloride	44B	110B	10
Acetone	51B	32B	12
2-Butanone	BCRDL	BCRDL	BCRDL
Semi-Volatile (ug/kg) (4-21-87)			
4-methylphenol		BCRDL	
Phenanthrene	BCRDL	BCRDL	
Anthracene	BCRDL		
Fluoranthene	BCRDL	BCRDL	
Pyrene	BCRDL	BCRDL	
Benzo(a)anthracene	BCRDL	BCRDL	
Bis(2-ethylhexyl)phthalate	BCRDL	BCRDL	BCRDL
Chrysene	BCRDL	BCRDL	
Benzo(a)pyrene	BCRDL		
Metals (mg/kg) (11-13-85)			
Aluminum	14,000	11,000	
Arsenic	7.8	8.4	
Barium	100	100	
Beryllium	.716	.663	
Cadmium	.7	1.3	
Calcium	18,000	16,000	
Cobalt	10	8.6	
Copper	42	150	
Chromium	18	56	
Iron	35,000	31,000	
Lead	38	62	
Magnesium	7,100	7,800	
Manganese	840	510	

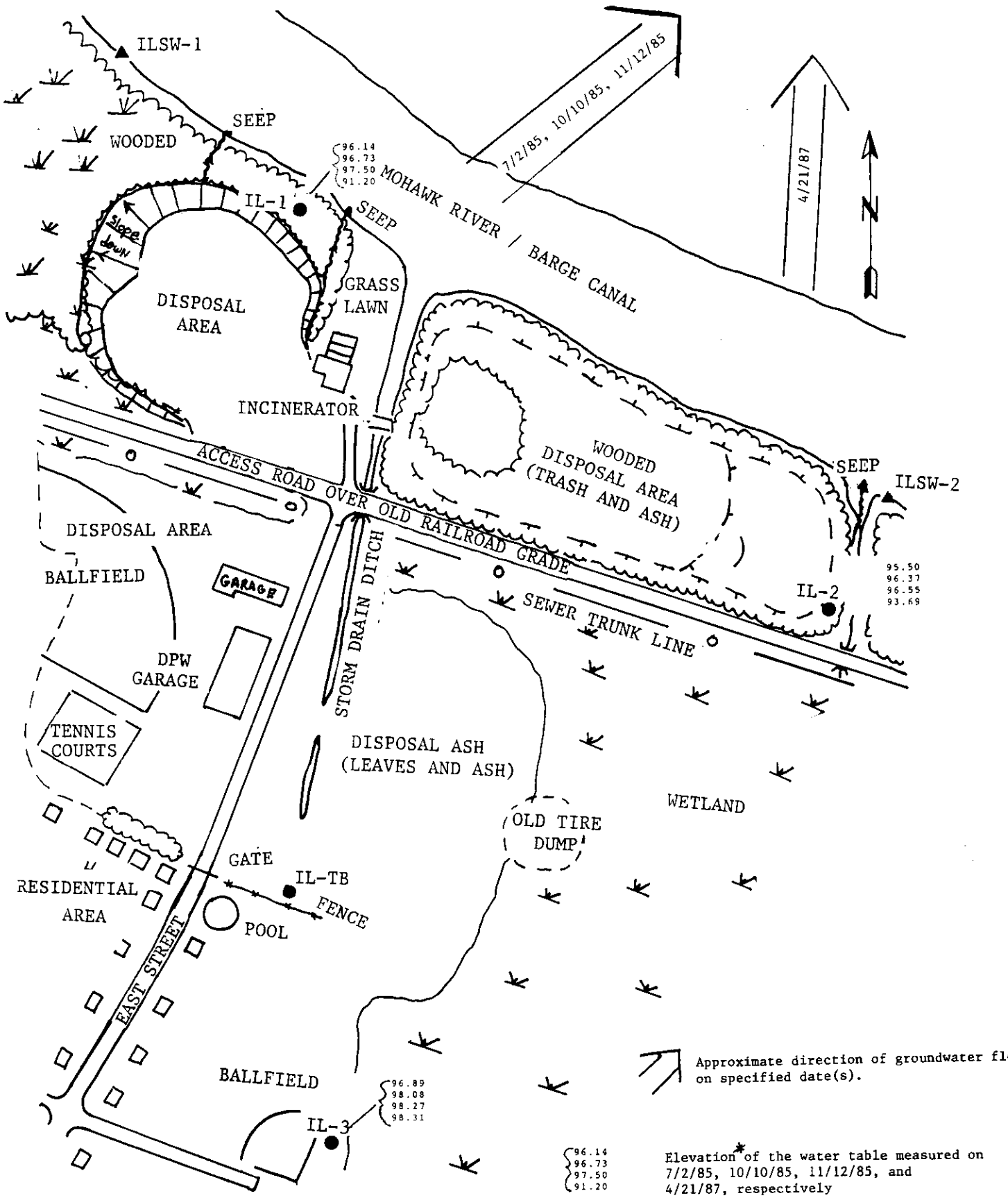
* The analytical program included the full Hazardous Substances List (HSL); however, this summary includes only those parameters detected in at least one sample. Refer to Appendix 3 (bound separately) of this report for the full CLP analytical package. Due to missed holding times for BNA, pesticides on PCB, the two sediment sample locations were resampled by EA on 21 April 1987 for those parameters (holding times were again missed for pesticides and PCBs).

NOTE: BCRDL = Detected below contract required detection limits.

TABLE 4-3 (Cont.)

	Soil		
	Upriver ISED-1	Downriver ISED-2	Method Blank (soil) 18 NOV 1985
Metals (mg/kg) (13-11-85)			
Mercury	.26	.29	
Nickel	57	51	
Potassium	1,700	1,100	
Selenium	.25	.34	
Silver	.24	1.5	
Sodium	85	89	
Thallium	.2	.2	
Tin		.34	
Vanadium	20	19	
Zinc	130	230	
Phenols Total	.7	.4	
Cyanide Total	.3	.3	

MAP OF GROUNDWATER FLOW DIRECTION



Note: Base map modified (enlarged) from 21 June 1984 aerial photograph.

Figure 4-1.

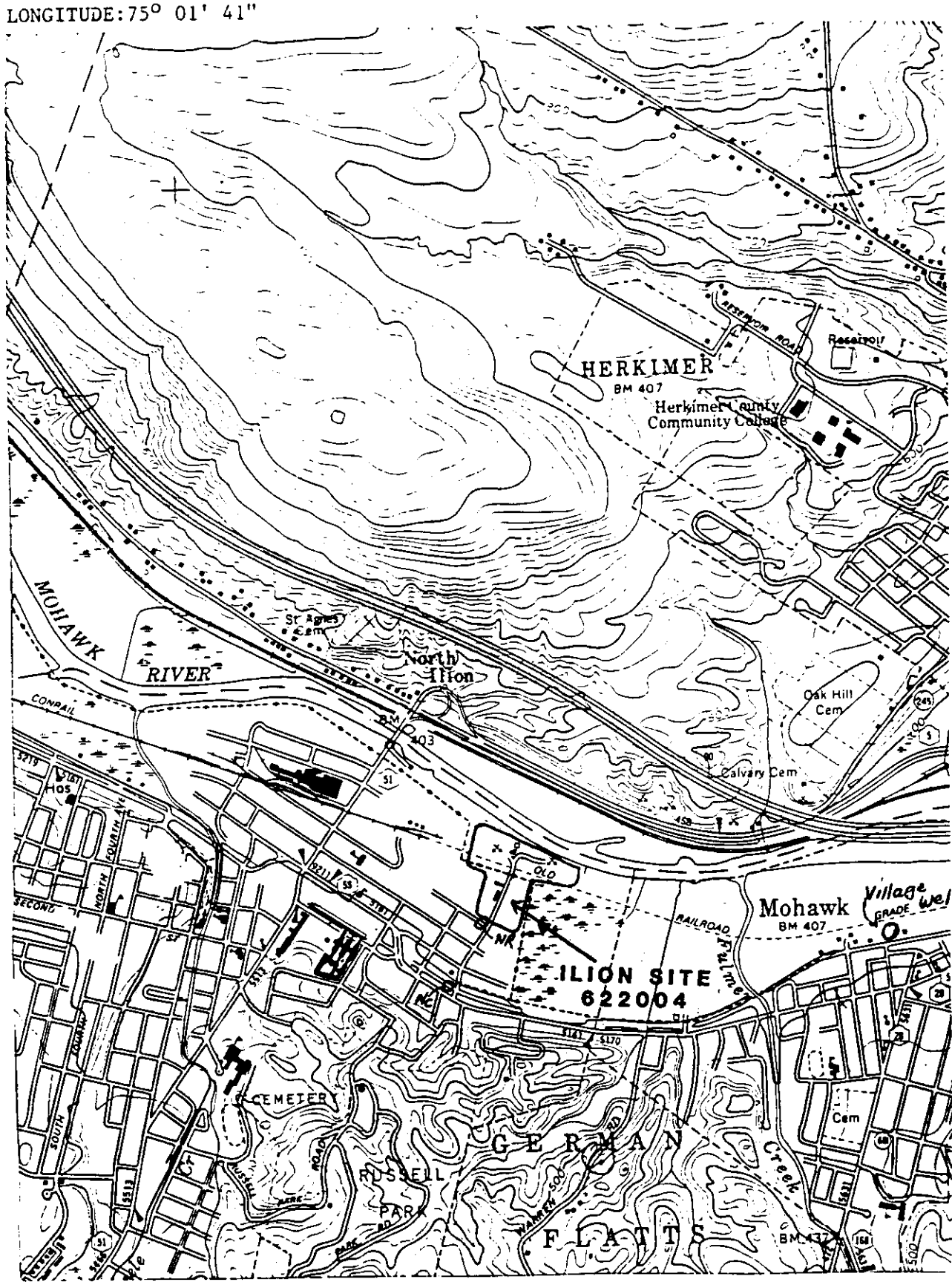
5. NARRATIVE SUMMARY

The Ilion landfill covers 25 acres in the Village of Ilion, Herkimer County, New York. The Village of Ilion owns the property and operated a dump at the site between 1933-1971 for the disposal of municipal waste, including wastes from Remington Arms and other local industries. An onsite incinerator was used to burn wastes at the site. The site is currently used by the Village of Ilion for the Department of Public Works office and garage, as well as for recreation since 1980 when ballfields and tennis courts were built on a portion of the site. There is no documentation of hazardous wastes being disposed at the Ilion landfill.

The analytical results of water and sediment samples collected from this site (refer to Section 4.4) do not indicate a significant increase in the concentration of any parameter between samples collected upgradient and downgradient of the site. U.S. EPA considers a significant increase to be at least a 10-fold increase if one contaminant is detected in both the upgradient and downgradient wells, a 5-fold increase if several contaminants are detected in both the upgradient and downgradient wells, and a 3-fold increase if the contaminant found in the downgradient well is below the detection limit in the upgradient well. Thus for the purpose of HRS, the analytical results of this Phase II do not confirm a release of contaminants specifically from the Ilion landfill.

COORDINATES
LATITUDE: 43° 01' 08"
LONGITUDE: 75° 01' 41"

ILION LANDFILL



ILION QUAD

7.5 Minute Series

0 2000 Feet

SCALE: 1 in.=2000 ft.

Facility name: Ilion Landfill

Location: Ilion Village, Herkimer County, New York

EPA Region: II

Person(s) in charge of the facility: Charles Haggerty, Village Administrator

City Hall, Morgan Street

Ilion, New York 13357

Name of Reviewer: Tom Porter Date: 30 April 1986

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

The site is a 25-acre inactive dump located in the Village of Ilion and bordered by the Mohawk River/Barge Canal to the north, wetlands to the east and west, and a residential area to the south. The landfill received municipal and local industrial waste. An onsite incinerator was used to burn the wastes. EA has researched all pertinent agency files, interviewed the site owner, conducted a site inspection and field program and has found no documentation of hazardous waste having been disposed of at the site. Additionally, the analytical results for water and sediment samples collected from the site do not confirm a release of contaminants from the Ilion landfill. Therefore, because the EPA Hazard Ranking System is designed to evaluate migration pathways of identified hazardous substances from a site, and because there are apparently none in this case, it is not appropriate to provide a Hazard Ranking Score (or documentation) for this site.

Scores: S_M = S_{gw} = S_{sw} = S_a =)

S_{FE} =

S_{DC} =

FIGURE 1
HRS COVER SHEET

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: As briefly as possible, summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference. Include the location of the document.

FACILITY NAME: Ilion Landfill

LOCATION: Village of Ilion, Herkimer County, New York

DATE SCORED: 30 April 1986

PERSON SCORING: Thomas Porter

PRIMARY SOURCES(S) OF INFORMATION (e.g., EPA region, state, FIT, etc.)

EA Science and Technology Phase II field activities.
New York State Department of Environmental Conservation.
Site Owner.

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

COMMENTS OR QUALIFICATIONS:

EA has researched all pertinent agency files, interviewed the site owner, conducted a site inspection and field program, and has found no documentation of hazardous waste having been disposed at the Ilion Landfill. Additionally, the analytical results for water and sediment samples collected from the site do not confirm a release of contaminants from the Ilion landfill. Therefore, because the EPA Hazard Ranking System is designed to evaluate migration pathways of identified hazardous substances from a site, and because there are apparently none in this case, it is not appropriate to provide a Hazard Ranking Score (or documentation) for this site.

United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington, DC 20460

EPA Form 2070-13
July, 1981

Ilion Landfill

EPA

Potential Hazardous Waste Site

Site Inspection Report

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D 980506885

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Ilion Landfill	East Street				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Ilion	NY	13357	Herkimer	043	26

09 COORDINATES: LATITUDE 43° 01' 08" | LONGITUDE 75° 01' 41"

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☒ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
04 / 17 / 85 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1933 (BEGINNING YEAR) 1971 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☒ F. STATE CONTRACTOR EA Science & Tech. (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
James A. Shultz	Geologist	EA Sci. & Tech	(914) 692-6706
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Joyce Ferencz	Health and Safety Officer	EA Sci. & Tech	(301) 771-4950
Tom Porter	Geologist	EA Sci. & Tech	(914) 692-6706
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Charles Haggerty	Village Administrator		(315) 894-4870
Jim Rowland	DPW Supervisor		(315) 894-5217
Charles Wilson	Previous Plant Operator		( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1400	Sunny, windy, 50-60°

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
James A. Shultz	EA Science and Technology	(914) 692-6706

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Thomas Porter		EA	(914) 692-6706	04 / 29 / 86 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980506885

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

☐ A. SOLID ☐ E. SLURRY
☐ B. POWDER, FINES ☐ F. LIQUID
☐ C. SLUDGE ☐ G. GAS
☐ D. OTHER _____ (Specify)

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

☐ A. TOXIC ☐ E. SOLUBLE ☐ I. HIGHLY VOLATILE
☐ B. CORROSIVE ☐ F. INFECTIOUS ☐ J. EXPLOSIVE
☐ C. RADIOACTIVE ☐ G. FLAMMABLE ☐ K. REACTIVE
☐ D. PERSISTENT ☐ H. IGNITABLE ☐ L. INCOMPATIBLE
☐ M. NOT APPLICABLE

III. WASTE TYPE Municipal and Local Industry

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers) None Documented

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

V. FEEDSTOCKS (See Appendix for CAS Numbers) Not applicable

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

New York State Department of Environmental Conservation Division of Solid and Hazardous Waste NYSDECDSHW) Site File.
Site Interviews; Charles Wilson (Plant Operator), and Jim Roland (DPW Supervisor)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980506885

II. HAZARDOUS CONDITIONS AND INCIDENTS None

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980506885

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued) None

01 ☐ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION (Include name(s) of species)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums)
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)

EA Site Inspection 13 April 1985.
NYSDECDSHW: Site Files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980506885

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☒ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☒ H. OPEN DUMP	Unknown	
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

☒ A. BUILDINGS ON SITE

3

06 AREA OF SITE

25 (Acres)

07 COMMENTS

No documentation of hazardous waste diposed at the landfill.

IV. CONTAINMENT No hazardous waste

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

There are no liners in the landfill and no system to divert surface water runoff. Drums have been observed, but were reportedly empty upon arrival. No drums of hazardous wastes were observed by EA personnel; only open-top trash barrels were observed.

V. ACCESSIBILITY No hazardous waste

01 WASTE EASILY ACCESSIBLE: ☐ YES ☐ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EA Site Inspection 13 April 1985.
NYSDECDSHW: Site Files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980506885

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. X	B. X
NON-COMMUNITY	C. ☐	D. X

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 4,400 (ft)
B. 1.0 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 9,557

03 DISTANCE TO NEAREST DRINKING WATER WELL 1.0 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
0-5 (ft)	Northeast	15 (ft)	Unknown (gpd)	X ☐ YES ☐ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings) Mohawk Village well serving 3,300 lies 1.0 miles east. Brookhaven Trailer Park serving 36 lies 1.6 miles south. Creekside Park well serving 25 lies 1.5 miles south. Delin Estates well serving 95 lies 1.95 miles west. Frankfort Village well serving 4,325 lies 2.25 miles west of site and depth to water is 30 feet below land surface.

10 RECHARGE AREA

☐ YES ☐ NO — COMMENTS

11 DISCHARGE AREA

☒ YES ☐ NO — COMMENTS: Mohawk River is adjacent to the site.

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Mohawk River/Barge Canal	☐	Adjacent (mi)
Skeele Creek	☐	1 (mi)
Fulmer Creek	☐	0.5 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 8,493 NO. OF PERSONS	B. 17,690 NO. OF PERSONS	C. 26,724 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

Adjacent (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

04 DISTANCE TO NEAREST OFF-SITE BUILDING

Adjacent (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The Mohawk River borders the site to the north while a residential area borders the southern end. The Village of Mohawk lies .6 miles to the east and the Village of Frankfort lies 2 miles to the west.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980506885

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☒ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one) Unknown (shale)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
≥ 150 (ft)	Unknown (ft)	Unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
13 (in)	2.25 (in)	3 %	North	3.5 %

09 FLOOD POTENTIAL: SITE IS IN 10 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. Adjacent* (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species): N/A (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. .25 (mi)	B. Adjacent (mi)	C. _____ (mi)	D. 1.25 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The Ilion Landfill borders the southern bank of the Mohawk River/Barge Canal. The site, sitting on the floodplain of the River is nearly flat. Extensive wetlands abut the eastern and western edges and the Village of Ilion borders the southern edge.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EA Site Inspection 13 April 1985

USEPA: Uncontrolled Hazardous Waste Site Ranking System. A Users Manual.

DOH: NYS Atlas of Community Water Systems Sources.

Halberg, H.N. et al. 1962. Water Resources of the Utica-Rome Area, U.S.G.S. Water Supply Paper 1499-C.

* As defined in the U.S. EPA 40 CFR Part 230, Appendix A, 1980.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980506885

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	3	EA Engineering, Science, & Technology	
SURFACE WATER	2	EA Engineering, Science, & Technology	
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL	2	EA Engineering, Science, & Technology	
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
HNU	No significant readings above background level.
Site Slope	Using Suunto Clinometer
Well elevations	Feet above/below an assumed datum of 100 feet, established at IL3
Geophysical survey	Both conductivity and resistivity

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF EA Science and Technology
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS EA

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Short-term low-yield pump test of monitoring wells.
Grain size analysis of selected sediment samples from the borings.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EA Phase II sampling program and field work

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980506885

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
Village of Ilion	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
City Hall, Morgan Street	

05 CITY	06 STATE	07 ZIP CODE
Ilion	NY	13357

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980506885

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
Same as owners	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first. Provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980506885

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980506885

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980506885

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA FORM 2070-13 (7-81)

6. REMEDIAL COST ESTIMATE

Based upon the results of this Phase II investigation, no remedial action is currently recommended. However, it is recommended that the black tarry substance encountered during installation of IL-TB be sampled and analyzed and the source identified (if possible), and that sampling and analysis be continued for one year, including four sets of sample collection (one set during each season) from eight locations including:

a. Each of the three Phase II monitoring wells.

b. The two Phase II surface water sample locations along the Mohawk River/Canal.

c. Three leachate seeps (previously dry during the Phase II sampling effort).

It is estimated that the continued sampling and analysis program would cost approximately $70,000. (including field labor, equipment, subsistence, and laboratory fees for full HSL analysis).

At the end of the program, the data should be evaluated (along with the Phase II generated data) with regard for the addition/relocation of monitoring wells and/or the need for remedial action or delisting of the site.

APPENDIX 1.3.1-1

Contact	Information Received
Mr. Charles Haggerty, Adm. Village of Ilion Ilion, New York 13357 (315) 894-4870	Site interview File, correspondence Analytical data
Mr. Jim Roland, Supervisor Department of Public Works Ilion, New York 13357 (315) 894-5217	Site interview
Mr. Charles Wilson, Employee Village of Ilion Ilion, New York 13357	Site interview
Mr. Marsden Chen, P.E./Mr. Jim Tofflemire New York State Department of Environmental Conservation of Site Control 50 Wolf Road Albany, New York 12233-0001 (518) 457-0639	Site file: NUS, HRS scoring sheets, analytical data, Bureau blueprint for ballfield
Mr. Darrel Sweredowski New York State Department of Environmental Conservation Watertown, New York 13601 (315) 785-2513	No information
Mr. Ron Herkins New York State Department of Health Syracuse, New York 13202 (315) 428-4718	No information
Mr. Pat Trap New York State Department of Health District Office Utica, New York 13501 (315) 793-2585	No information
Mr. Mike Gappin/Mr. Hans Arnold Environmental Management Council Oneida/Herkimer Counties Utica, New York 13501 (315) 798-5710	Comprehensive wastewater management studies, Oneida-Herkimer Counties, New York

Contact	Information Received
Mr. Kevin Walter, P.E. New York State Department of Environmental Conservation Division of Hazardous Waste Enforcement 50 Wolf Road Albany, New York 12233-0001 (518) 457-5637	No file
Mr. John Iannotti, P.E. New York State Department of Environmental Conservation Bureau of Remedial Action 50 Wolf Road Albany, New York 12233-0001 (518) 457-5637	No file
Mr. Earl Barcomb, P.E. New York State Department of Environmental Conservation Landfill Operations Vatrano Road Albany, New York 12205 (518) 457-2051	Site file
Mr. Peter Skinner, P.E. New York State Attorney General's Office Room 221 Justice Building Albany, New York 12224 (518) 474-2432	No file
Mr. Ron Tramontano/Mr. Charlie Hudson Bureau of Toxic Substance Assessment New York State Department of Health Nelson A. Rockefeller Empire State Plaza Corning, Tower Building, Room 342 84 Holland Avenue Albany, New York 12237 (518) 473-8427	No file
Mr. Perry Katz U.S. Environmental Protection Agency Region II Room 757 26 Federal Plaza New York, New York 10278 (212) 264-4595	No file

Contact

Ms. Diana Messina
U.S. Environmental Protection Agency
Region II
Surveillance and Monitoring Branch
Woodbridge Avenue
Edison, New Jersey 08837
(201) 321-6776

Information Received

No file

APPENDIX 1.3.2-1

GEOPHYSICAL FIELD EQUIPMENT AND GENERAL METHODOLOGY

Two geophysical instruments were used at the site to evaluate general subsurface conditions (geology, depth to ground water, and contamination). The following provides a description of the equipment used.

Terrain Conductivity

EM-34

The Geonics, Ltd. EM-34 terrain conductivity meter is portable and non-destructive. The EM-34 has variable depth capability. The variable depth capability allows the user to measure subsurface conductance at more than one depth. This is important when depth to rock or approximate depth of contamination plumes is required. The EM-34 has separate transmitter and receiver coils. The coils are connected by either a 10-, 20-, or 40-meter cable which determines that general depth range being investigated. In addition to being able to change cable lengths, the operator can change the receiver and transmitter orientations (horizontal and vertical dipole modes) to gather more detailed subsurface information.

The transmitter induces very small (primary field) current into the earth from a magnetic dipole transmitter coil producing a weak secondary magnetic field. The equipment compares the weak secondary field with the primary field using advanced current techniques to produce direct terrain conductivity (mmhos/m) readings.

Resistivity

Resistivity soundings were performed using a Bison 2350B earth resistivity meter.

The 2350B earth resistivity meter measures the nature of subsurface materials in ohm-feet. This technique employs four electrodes (two outer and two inner) along a straight line (for the Wenner and Schlumberger arrays). The instrument induces a DC current into the ground through the outer electrodes, and the potential difference may be affected by differences in geology, porosity, dissolved ions, soil moisture, and/or water quality. As the electrode positions are moved, specific potential differences are recorded. For each potential difference, apparent resistivity can be calculated. When the apparent resistivity values are plotted, the nature of subsurface conditions (locations of voids, sand and gravel, water quality, etc.) can be inferred both quantitatively and qualitatively.

The following eight pages provide the Ilion landfill geophysical report prepared by Delta Geophysical Services.

ILION LANDFILL SITE

CONDUCTIVITY

Terrain conductivity perimeter lines were made with an EM-34 (20 meter cable), which allowed us to measure subsurface conductance (mmhos/m) for two effective depths (25 and 45 feet). A total of 7 survey lines were run and conductivity data collected at 30-foot stations along each line. The perimeter lines were located relative to known geologic and/or hydrogeologic information, "noise" from external interferences (power lines, underground pipes, etc.) and limited accessibility (water, structures, etc.). The data recorded from two effective depths were used to locate anomalous zones which may indicate subsurface contamination (plumes).

The conductivity lines are shown on both Plates (1 and 2) with corresponding conductivity values (mmhos/m).

Plate 1 (effective depth: 25 feet) shows five anomalous zones as shaded areas. These five anomalous zones are interpreted to be possible subsurface contamination.

Plate 2 (effective depth: 45 feet) shows one anomalous zone. This anomalous zone is interpreted to be possible subsurface contamination.

RESISTIVITY

Four Schlumberger resistivity soundings were run to an electrode spacing of approximately 80 feet adjacent to the high conductivity anomalous zones suspect of subsurface contamination (see Plates 1 and 2 for locations).

Each resistivity sounding was analyzed using computer and conventional techniques to best interpret the data.

Resistivity sounding 1 reflects three general layers (see computer curve plots in Appendix). The upper layer (0-3) feet has been interpreted to be unsaturated silt and sand. The intermediate layer (3-12) feet is interpreted to be saturated sand and gravel and the third layer greater than 12 feet has been interpreted to be saturated sand and gravel. The depth to water is interpreted to be approximately 3 feet.

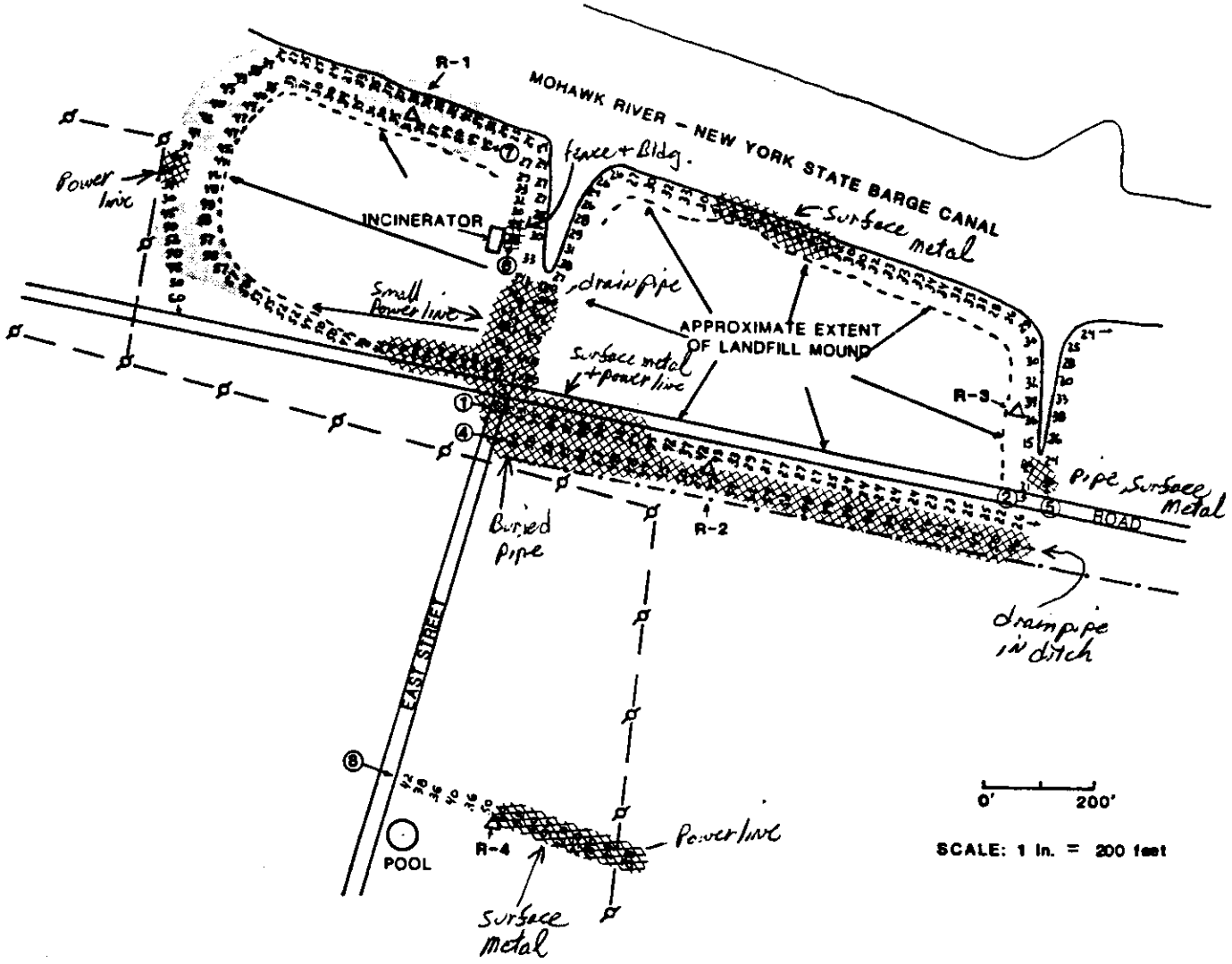
Resistivity sounding 2 (*) reflects two general layers. The upper layer (0-12 feet) has been interpreted to be unsaturated sand and silt. The second layer greater than 12 feet is interpreted to be saturated sand and gravel. The depth to water is interpreted to be approximately 12 feet.

Resistivity sounding 3 reflects three general layers. The upper layer (0-8 feet) has been interpreted to be unsaturated silt and

sand. The intermediate layer (8-50 feet) is interpreted to be saturated sand and gravel and the third layer greater than 50 feet is interpreted to be silt, sand and clay. The depth to water is interpreted to be approximately 3 feet.

Resistivity sounding 4 (*) reflects three general layers. The upper layer (0-9 feet) has been interpreted to be unsaturated silt, sand and fill material. The intermediate layer (9-50 feet) is interpreted to be saturated silt, sand and fill material and the third layer (greater than 50 feet) is interpreted to be silt and/or clay. The depth to water is interpreted to be approximately 10 feet.

* Due to poor coupling and external interferences the data gathered at this resistivity sounding is questionable.



N

ILION LANDFILL

CONDUCTIVITY SURVEY

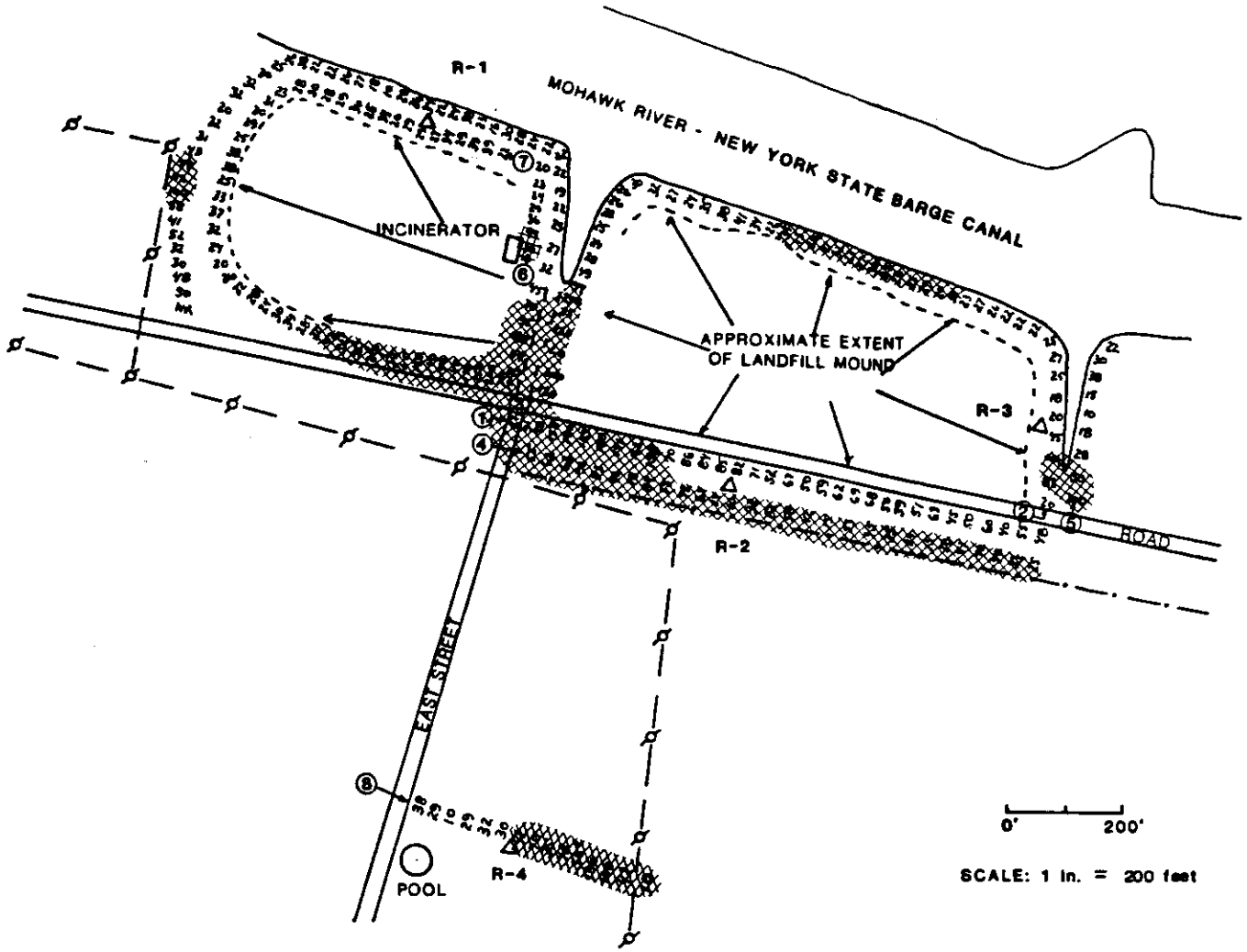
EFFECTIVE DEPTH: 25 feet

- CONDUCTIVITY VALUES (mmhos)
- ANOMALOUS ZONE
- Δ R-1 RESISTIVITY SOUNDING
- POWERLINE
- DRAINAGE DITCH
- EXTERNAL INTERFERENCES (Probable Sources noted)

EA

PLATE 1

Delta Geophysical Services



N

ILION LANDFILL

CONDUCTIVITY SURVEY

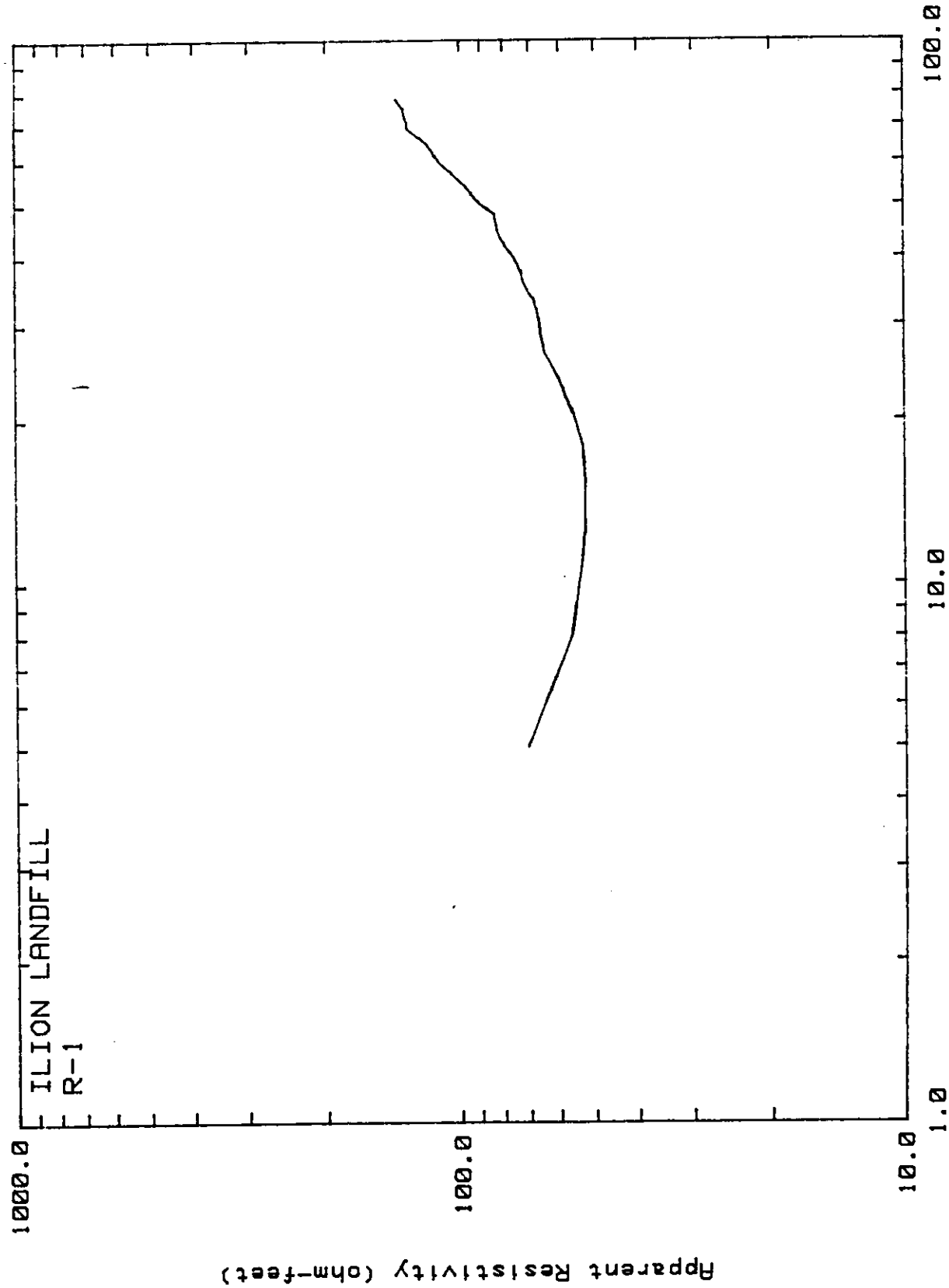
EFFECTIVE DEPTH: 45 feet

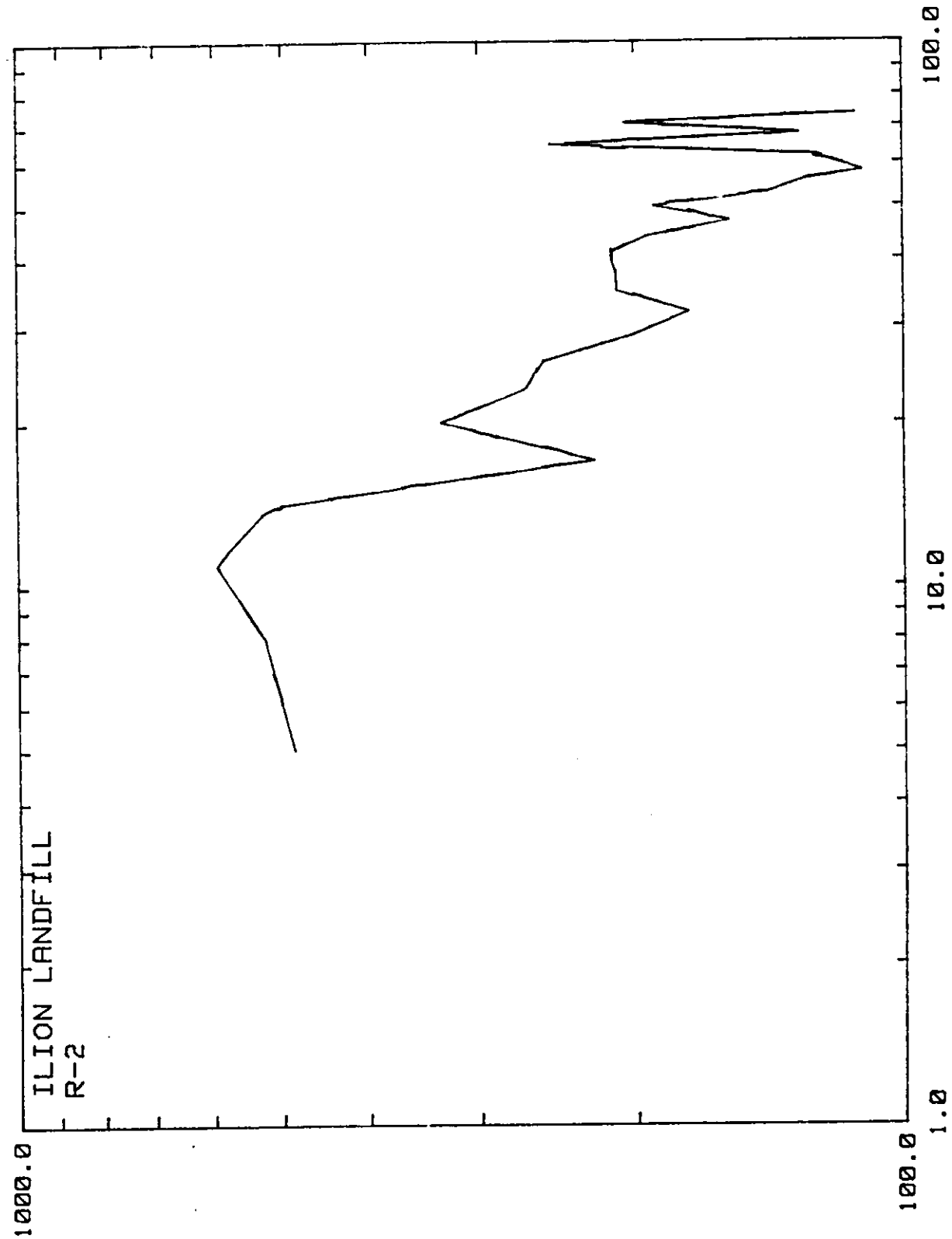
- CONDUCTIVITY VALUES (mmhos)
- ANOMALOUS ZONE
- Δ R-1 RESISTIVITY SOUNDING
- POWERLINE
- DRAINAGE DITCH
- EXTERNAL INTERFERENCES

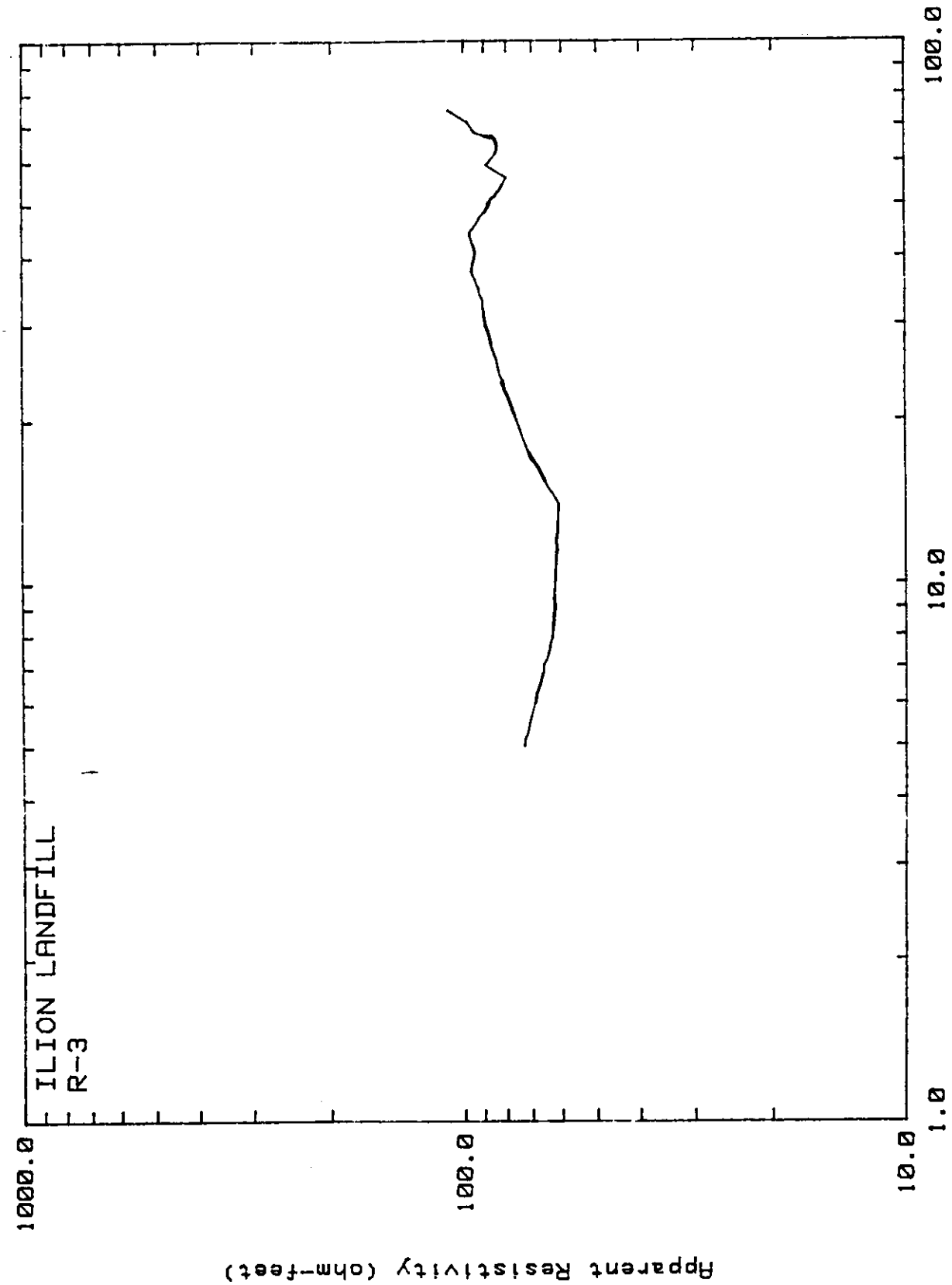
(Probable sources are annotated on Plate 1)
JAS
EA

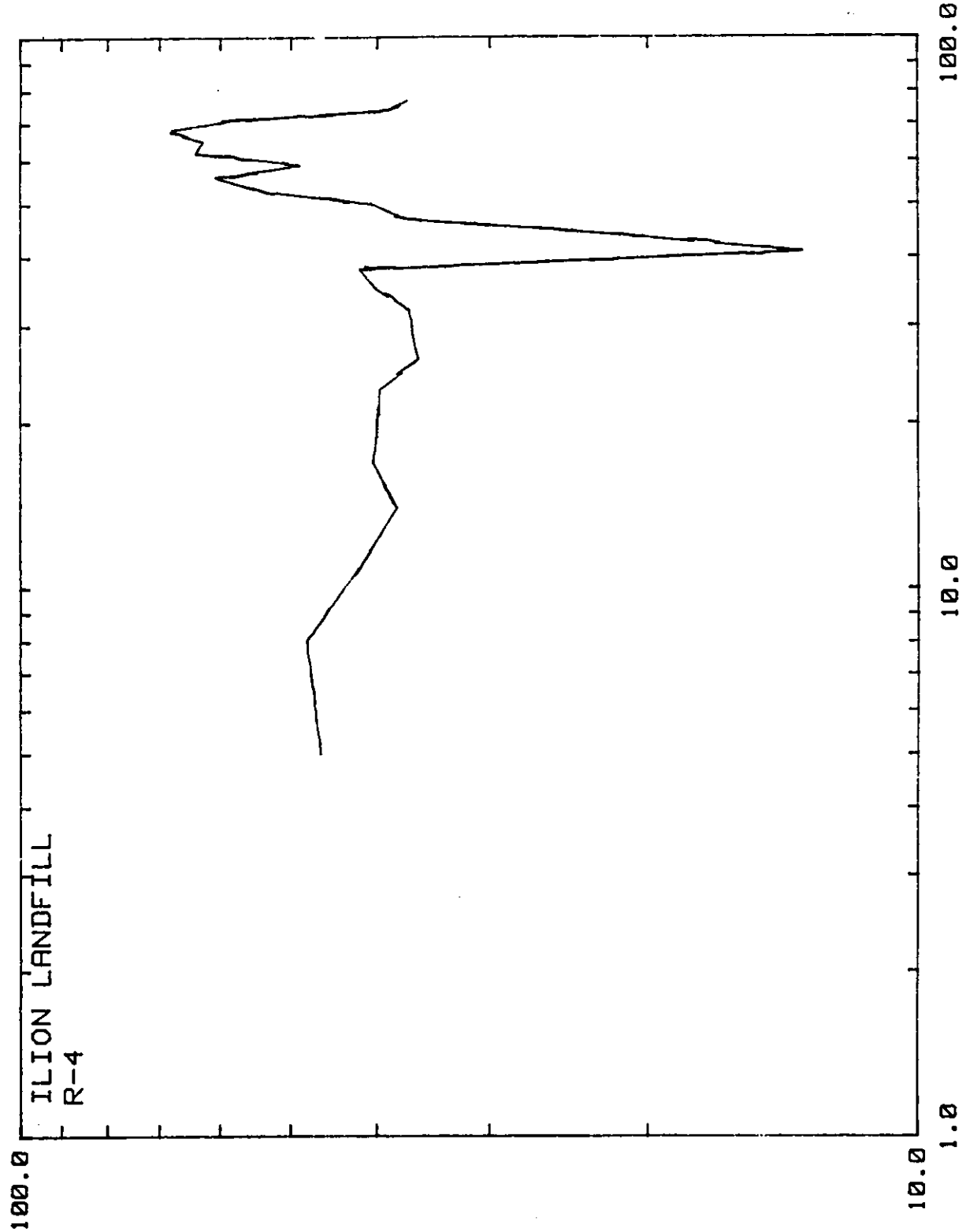
PLATE 2

Delta Geophysical Services


ILION LANDFILL
R-1
1000.0
100.0
10.0
1.0
10.0
100.0
Apparent Resistivity (ohm-feet)
Electrode spacing (feet)
Type: SCHLUMBERGER


ILION LANDFILL
R-2
1000.0
100.0
1.0
10.0
100.0
Apparent Resistivity (ohm-feet)
Electrode spacing (feet)
Type: SCHLUMBERGER


ILION LANDFILL
R-3
1000.0
100.0
10.0
1.0
10.0
100.0
Apparent Resistivity (ohm-feet)
Electrode spacing (feet)
Type: SCHLUMBERGER


ILION LANDFILL
R-4
100.0
10.0
1.0
10.0
100.0
Apparent Resistivity (ohm-feet)
Electrode spacing (feet)
Type: SCHLUMBERGER

APPENDIX 1.3.2-2

OBSERVATION WELL INSTALLATION AND TESTING PROCEDURES

Observation Well Drilling and Sediment Sampling

A track-mounted CME-45 drill rig was used. A hollow-stem auger drilling method was used in unconsolidated sediments, using a 4-1/4-in. I.D. auger.

Prior to the drilling of each boring/well, and at the completion of the last boring/well, the drilling equipment which came in contact with subsurface materials was pressure washed with hot potable water. Soil sampling of the unconsolidated sediments was performed using a split spoon sampler, at approximately 5-ft intervals and at detected major stratigraphic changes. The split spoon sampler was pressure washed with hot potable water before and after each sample. An HNU was used to monitor the potential organic vapors emitted during drilling operations and from each soil sample. Samples of the major soil/unconsolidated sediment types encountered during drilling were collected and grain size analysis was performed on selected representative samples. Unless otherwise instructed, all drill cuttings, fluids, and development/purging water were left on, or discharged to, the ground surface in the immediate area of the activity. An HNU reading of at least 5 ppm above ambient readings was established by NYSDEC as the criteria above which fluids and cuttings were to be collected and drummed for future appropriate disposal by NYSDEC.

Well Construction

Immediately prior to installation, the well pipe and screen were cleaned with a hot potable water pressure washer. Standard well construction for wells completed in unconsolidated sediments consisted of a 1-ft layer of sand placed at the bottom of the borehole below 10 feet of 2-in. diameter threaded-joint PVC well screen and an appropriate length of 2-in. diameter PVC riser with a bottom plug/cap. A sand pack of appropriate grain size was placed around the well screen up to 2 feet above the top of the screen, followed by a bentonite seal approximately 2 feet in thickness. A grout-bentonite mixture was then added to fill the annular space from the top of the bentonite seal up to grade. For PVC wells installed, the filter sand and bentonite pellets were carefully placed by hand down the annular space between the hollow-stem auger and the PVC well pipe as the augers were slowly withdrawn. The depth to the top of the filter sand or bentonite pellets were constantly monitored with a clean, weighted-tape and compared to the depth of the base of the hollow-stem auger. The volume of filter sand and bentonite pellets needed was estimated and compared with the actual volume used. Because the PVC wells are screened, the uppermost few feet of the water table aquifer, the bentonite seal was generally close to ground surface and allowed for careful placement of the grout from ground surface.

Well Development

The development of the monitoring wells was performed by pumping as soon as practical after well installation. When developed by pumping, a centrifugal pump was used when the depth to water is less than 20 feet below ground surface.

For development using a centrifugal pump, a new, unused length of polyethylene flexible pipe was used in each well as a suction line. The pipe was fitted approximately 6 inches from its lower end with a steel washer large enough to fit over the polyethylene pipe but small enough to fit into the well, held in place by hose clamps on either side of the washer. New, unused washers and clamps were used for each well. The washer acts as a plunger (surge block) when raised and lowered in the screen interval. The well was simultaneously pumped and surged throughout the screen interval until the discharge water appeared to be clear.

Pump Tests of Monitoring Wells

A short-term, low-yield pumping test was performed in each well. Each test was comprised of: (1) a continuous discharge, pumped (drawdown) phase, and (2) a recovery phase. For such a test, pumping and water level measurement occurred in the same well.

In performing the short-term pumping test, first the static water level was measured and recorded prior to setting the pump. The pump was then started at a discharge rate set compatible to the estimated amount of ground water yielded by the well, simultaneously a stop-watch was started. Accurate depth to water measurements during the drawdown phase were obtained and recorded at regular intervals. The discharge rate was also measured (using a calibrated bucket and a stop watch) at different times during the pumping phase. When little or no further drawdown occurred, the pump was stopped. Time and water level measurements of the recovery phase instantly began. Accurate depth to water measurements were recorded at regular intervals until 90 percent recovery to the static (pre-pumping) water level was achieved.

The short-term pumping tests were performed using a centrifugal pump for depth to water less than 20 feet below ground surface. The centrifugal pump provided a wide range of discharge rates, from approximately 50 gpm to <5 gpm, which was controlled by a ball-valve attached to the discharge line. A new, unused length of polyethylene flexible pipe was used as a suction line for each well.

A Q.E.D. water level indicator was used to measure depth to water in the wells; this instrument has depth markers at 0.05-ft intervals. The Q.E.D. probe was decontaminated between wells by washing with Alkanox detergent, then rinsed with deionized water, acetone, and hexane.

APPENDIX 1.3.2-3

SAMPLING PROCEDURES

A variety of sample types were collected. These included ground water from monitoring wells, and surface water and sediment from streams. All sampling was conducted by experienced personnel under supervision of the project manager. All sampling was accomplished under a rigorous chain-of-custody protocol. All samples were placed in containers of appropriate composition containing appropriate preservatives as presented in Table 7-1 of the Work/QA Project Plan for the current Amendment to Perform Phase II Work dated 16 January 1985. All sampling included trip blanks to further validate the data generated (refer also to Section 13, Sample Custody Procedures, of the Work QA/Project Plan).

Monitoring Well Ground-Water Sampling

One set of ground-water grab-type samples were obtained for chemical analysis from PVC monitoring wells installed for this project.

The purging and sampling of each well was performed at least one week after completion of well development. Each well was purged by a centrifugal pump to remove potentially stagnant water in the well and allow for the recharge of the fresh ground water to the well for sampling. Each sampled well was purged to dryness, or up to approximately four times the volume of the water column in the borehole, depending upon the well yield.

To ensure that all stagnant water was purged from the well, the suction line was lowered to the bottom of the well, at which time the pump was started. After the required volume of water had been nearly evacuated, the suction line was raised slowly to the water surface and allowed to pump for a short time. The volume of water to be purged was determined as follows. For wells completed in unconsolidated material, a sand-packed 2-in. diameter PVC well was installed in a 7-in. diameter borehole. Assuming 25 percent porosity of the sand pack, there is approximately a 0.50-gallon/linear foot of water in the borehole. A new, clean length of polyethylene flexible pipe was used in each well as the suction line.

Upon completion of the purging operation at each well, a sample of the ground water was obtained by using individual bottom-fill Teflon bailers lowered into each well with new polypropylene rope, or similar, for each well. For each well sampled, the bailer was handled with a new pair of disposable plastic surgical gloves. The bailer was lowered into each well slowly to minimize the potential for aeration of the water sample. Water samples were carefully transferred from the bailer to the sample containers to further minimize the potential for aeration of water samples, especially those for VOA. No "head space" was allowed in filled VOA water sample containers. Prior to arrival at the site, individual bottom-fill Teflon bailers were prepared in the laboratory for each well to be sampled. The preparation procedures were comprised of washing with hot water and Alkanox soap followed by a hot water rinse, acetone and hexane rinses, and air dried.

Surficial Soil Sampling

Surficial soil samples (stream sediment samples associated with surface water sampling) were collected using new individual, disposable polyethylene scoops. Prior to mobilization in the field, each scoop was cleaned in the laboratory, in the same manner as the teflon bailers. Each sample was handled with a new pair of disposable plastic surgical gloves and placed in appropriate containers (Section 7 of the Work/QA Project Plan).

Surface Water Samples

Grab-type surface water samples were collected in containers of appropriate composition containing appropriate preservative for the parameters to be determined. Each sample was handled with a new pair of disposable plastic surgical gloves and placed in appropriate containers (Section 7 of the Work/QA Project Plan).

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID AND HAZARDOUS WASTE
INACTIVE HAZARDOUS WASTE DISPOSAL SITE REPORT

Appendix 1.4.1-1
1 of 2

LASSIFICATION CODE: 2a REGION: 6 SITE CODE: 622004

A E OF SITE : Ilion Landfill
TREET ADDRESS:
C N/CITY: COUNTY: ZIP:
l on Herkimer

ITE TYPE: Open Dump-X Structure- Lagoon- Landfill- Treatment Pond-
S IMATED SIZE: 25 Acres

ITE OWNER/OPERATOR INFORMATION:
U RENT OWNER NAME....: same
U RENT OWNER ADDRESS.: same
WNER(S) DURING USE...: Ilion Village
P RATOR DURING USE...: same
P RATOR ADDRESS.....: same
ERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1934 To 1971

I E DESCRIPTION:
h.s non-active open dump was used for many years by the village and ocal industries. The location is very neary to the Mohawk River. The u p has not been used since 1970's.

H ZARDOUS WASTE DISPOSED: Confirmed- Suspected -X

TYPE	QUANTITY (units)
eavy metal sludges	unknown
ectroplating waste	unknown
lvents and degreasers	unknown

SITE CODE: 622004

ANALYTICAL DATA AVAILABLE:

Air- Surface Water- Groundwater-X Soil- Sediment- None-

CONTRAVENTION OF STANDARDS:

Groundwater- Drinking Water- Surface Water- Air-

LEGAL ACTION:

TYPE..: none State- Federal-
STATUS: In Progress- Completed-

REMEDIAL ACTION:

Proposed- Under Design- In Progress- Completed-
NATURE OF ACTION: none

GEOTECHNICAL INFORMATION:
SOIL TYPE: river valley deposits
GROUNDWATER DEPTH: unknown

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

ASSESSMENT OF HEALTH PROBLEMS:

Insufficient Information

PERSON(S) COMPLETING THIS FORM:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NAME.: Darrell Sweredowski
TITLE: Sanitary Engineer

NAME.: Robert A. Olazagasti
TITLE: SWMS

DATE.: 12/14/84

NEW YORK STATE DEPARTMENT OF HEALTH

NAME.: R. Tramontano
TITLE: Bur. Tox. Subst. Assess.

NAME.:
TITLE:

DATE.: 12/14/84

I started to work for the Village of Ilion on November of 1946 as Plant Operator and in charge of the dump area. All of the trash (ashes, bottles, and hard fill) were dumped on the right and left of the dump entrance and were overseen by a man named Minso Stark. At the Incinerator and Sewer site, east and west of the present building, all the larger material was burned and covered. The garbage and burnable materials that could be handled, were incinerated. At this time and before, the Remington Rand Co. had an open incinerator located north of the present Remington School property. At that time, the land was owned by Remington Rand and they did burn varnaline, oil, laquer, and paper in this pit, barrels were dumped and, to my knowledge, were salvaged. About 1947, we started to use refuge from the Arms and Rand to burn garbage as an auxiliary fuel and to cut down on the dumping and burning east and west of the Incinerator and the dumping was reduced at the Remington area. There was salvage going on by myself and Mr. Stark, with Village approval, at the same time others salvaged all usable material. So it is unlikely there was any material left unburned at either site. When we were unable to handle material because of shut down or holidays, we had emergency pits located west of the plant. I know barrels were dumped and materials burnt as I believe it was best to be incinerated and still believe incineration is the cheapest and most thorough method there is. As for the barrels and tanks that are in the area at the present, they were trucked in when the Remington Rand building and Arms building were taken down, also when Urban Renewal was being done, that the refuse was hauled in for fill to the west of the present Village Barn and east and west of the Incinerator. In this material were barrels that contractors used for barricades and as for the two tanks east of the Village, they were empty when dumped by contractors that tore down the Best Garage, Reynolds, and Lesters. So I am positive that no dangerous material was left undestroyed at the site. I think it was in the 60's that the Arms Company had a trucker (Ferdula) take their waste to his private dump in Frankfort. There was test boring done when the Thruway was planned also in the area of the dump north of the tracks where the new Sewage Plant was planned in conjunction with the old plant. Also, when the school was built and when the Industrial Park was planned for the area, when the new sewer trunk was under construction, a sample was taken by the road area. I believe pollution would have been found then.

Charles R. Wilson Sr.

IV CHARACTERIZATION OF POTENTIAL HAZARD - Page 2

04 Description of Potential Hazard to Environment and/or Population

1. Site was used as a dump, not a landfill.
2. Fourteen and a half years on the job, I have never seen heavy metals from any industry dumped on the site or anywhere near it.
3. The recreational fields were tested before anything was built. A hole was bored and a pipe was placed in the ground for tests.

WASTE INFORMATION- Page 3

Anything that was brought from the Arms or Univac was burnt.

HAZARDOUS CONDITIONS AND INCIDENTS

01 Groundwater contamination

1. The drums are from contractors that used barrels for blocking off areas for demolition.
2. Cannot see any leaching problems from barrels that are rusted and half deteriorated.
3. If household garbage, old lumber, trees and ashes are contaminated, then there is a problem.
4. Groundwater anywhere near the site is not used for drinking purposes for the Village of Ilion.
5. If water can run approximately 3 miles up hill to our reservoir on Elizabeth Town Road, we would have found out from our recent tests at the Reservoir.
6. Mohawk is also considered upgrade from this area. We get their flow of water.

01 Damage to Flora- Page 5

1. In inspecting the area, we are unable to find any drums that would contain waste material, reason being they are deteriorated. As far as the local flora, anyone can see that anything and everything grows in this area.

01 Damage to Fauna

1. Through the 14½ years, I have seen deer, pheasants, turtles, fish,birds, and even wild ducks in the swamp that breed in this area. None of these species have ever been found dead that have not been shot by some children.

01 Damage to Offsite Property

1. On August 18th & 19th, 1984, the N.Y.S. Bass Federation held a Tournament on the Barge Canal. Many of the bass and other type of fish were caught below the alleged area. As a fisherman, I have fished the mouth of Fulmer Creek and also the mouth of Steele's Creek and have caught plenty of fish. One species of trout, as you know, cannot live in any contaminated water.

01 Contamination of Sewers, Storm Drains

1. The Herkimer County Treatment Plants manhole and sewer lines rest in the same area as ducks that breed there. Also,the pipes and manholes are

watertight so that no water can enter the line. (Refer to Arthur Dunckel, Administrator of Herkimer County Sewer District).

[Herkimer County Wastewater Treatment Plant constantly monitors influent flow into the plant and into the Community. It is tested daily and monthly reports are sent to the N.Y.S. DEC. When foreign matter occurs, they are notified before the dumping.]

01 Illegal/Unauthorized Dumping

1. Access to the site from Central Avenue is blocked off by mounds of dirt. Access from East of the site has no access road for it except from the Herkimer County Sewer District, which is gated and locked.

01 Groundwater Contamination

1. Talking with my Working Foreman, who ran the Incinerator and Dump for the last 35 years, has confirmed that all the alleged material from the Industries were burnt.

WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA- Page 11

09 Description of Wells

1. If any private wells are within the Village, to my knowledge, they are violating a Village Ordinance. If any wells are south of Ilion- east, west or north, they are all uphill.

James Rowland

Appendix 1.4.1-4

317 Washington Street
Watertown, New York 13601
315-782-0100, Ext. 251

September 3, 1980

Mr. Anthony D. Carlisto, P.E.
Ward Associates, P.C.
45 West Main Street
Little Falls, New York 13365

Dear Mr. Carlisto:

Your letter of August 27, 1980, and the attached material, is acknowledged.

I have evaluated the water sample results and the proposal for constructing the ball fields and tennis courts; as I understand them, and feel that water with the contaminate concentrations listed do not indicate that any significant environmental hazard will be created by the Ilion Community Park project.

I have not evaluated the possible health effects or health implications of the water sample analyses.

Please note that my opinion applies only to the current proposal for two softball fields, three tennis courts, the game area, and the parking field. No opinion is given regarding the environmental suitability of this site for a swimming pool development.

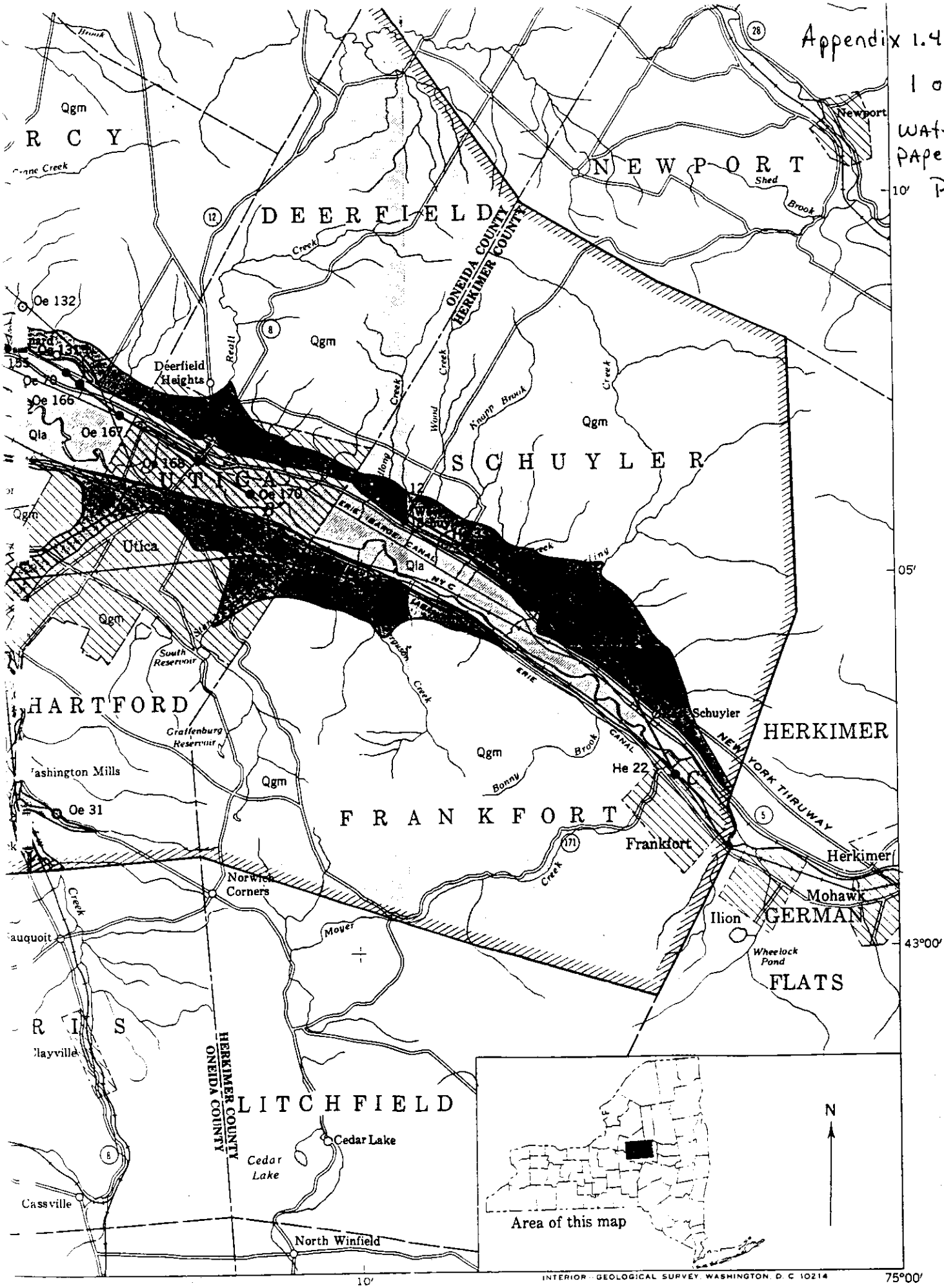
If you have any questions, please call me at your convenience.

Very truly yours,

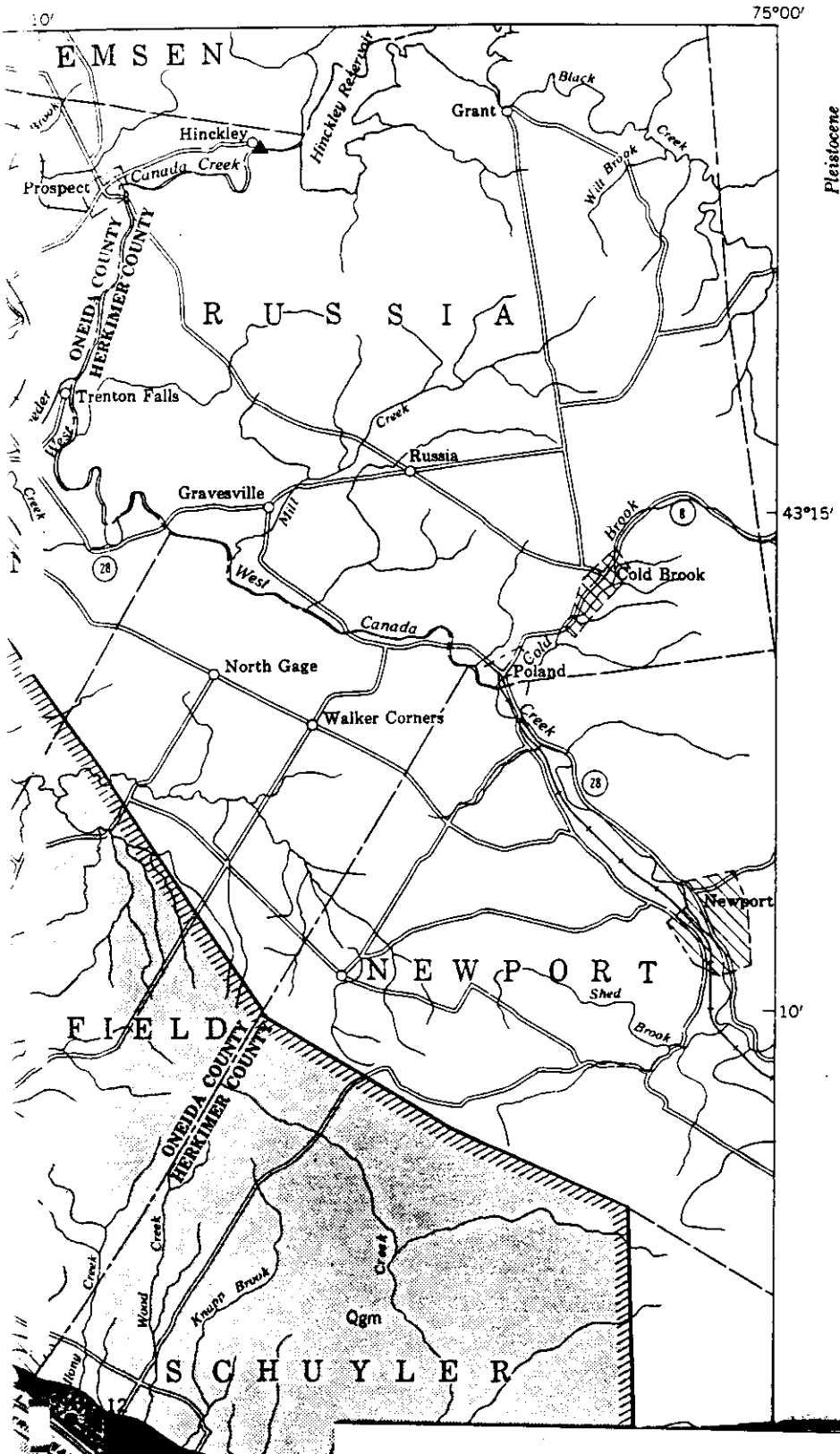
Berton E. Mead, P.E.
Regional Engineer
Region 6

BEM:ks

cc: R. Tramontano, State Health Department



Geology in part modified from U. S. Dept. of Agriculture soil survey maps of Herkimer County (1929) and Oneida County (1915)



EXPLANATION

Pleistocene and Recent

Qla

Lacustrine and alluvial deposits

Clay, silt, and sand. Small to moderate quantities of water supplied from beds of sand

Pleistocene

Glaciofluvial and deltaic deposits

Sand and gravel. Most productive aquifer in area. Supplies moderate to large quantities of water

Qgm

Ground moraine till

Unsorted clay, silt, and boulders. Includes some areas of bedrock. Generally a poor aquifer but furnishes small supplies to domestic dug wells

QUATERNARY

Contact, approximately located

▲ Stream gaging stations

⊙ Oe 42
Well sampled for quality of ground water

● Oe 131
Well used in geologic section

Geologic sections shown on Plate 3

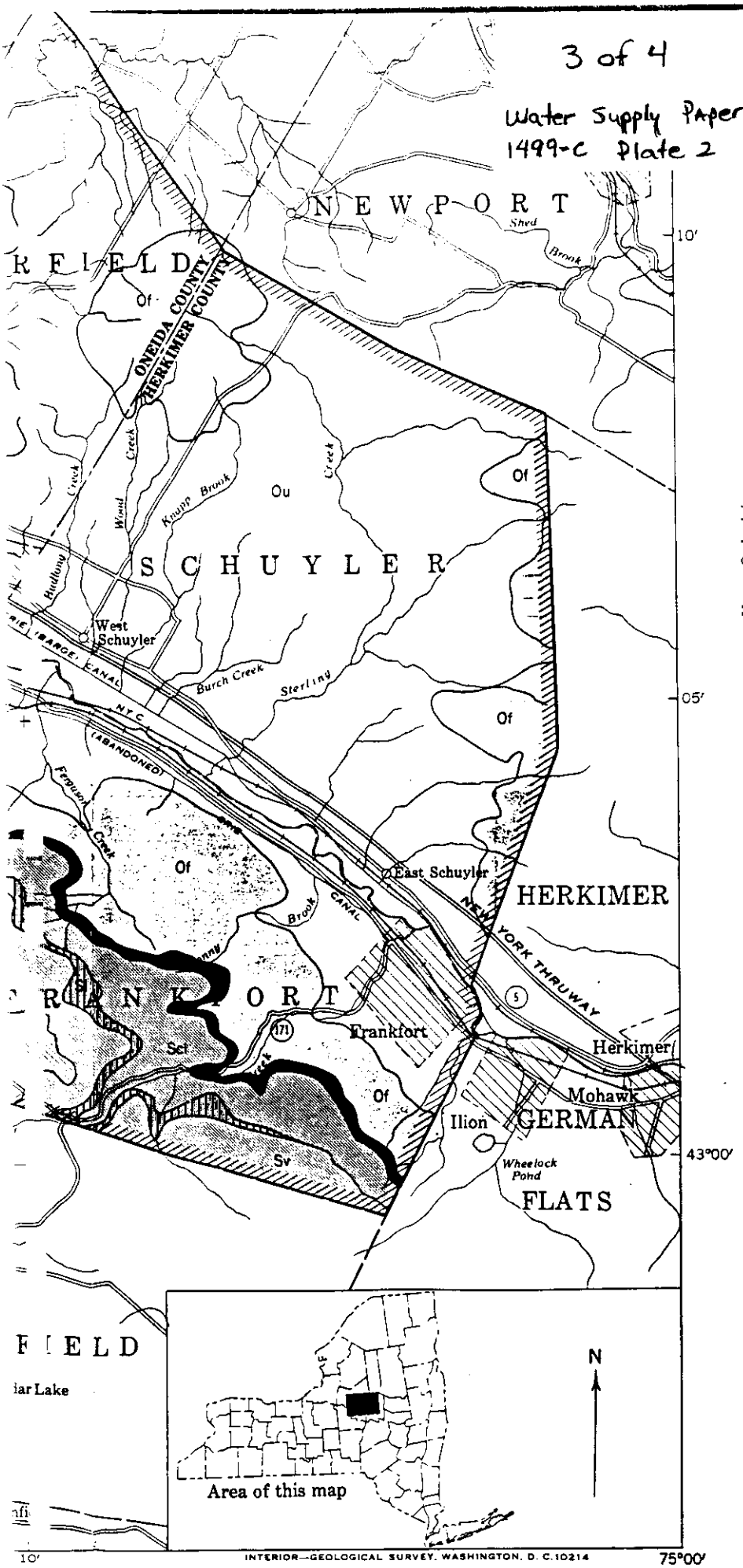
ROME AREA, NEW YORK, SHOWING GEOLOGY OF TH

SCALE 1:125 000

1 0 1 2 3 4 5 MILES

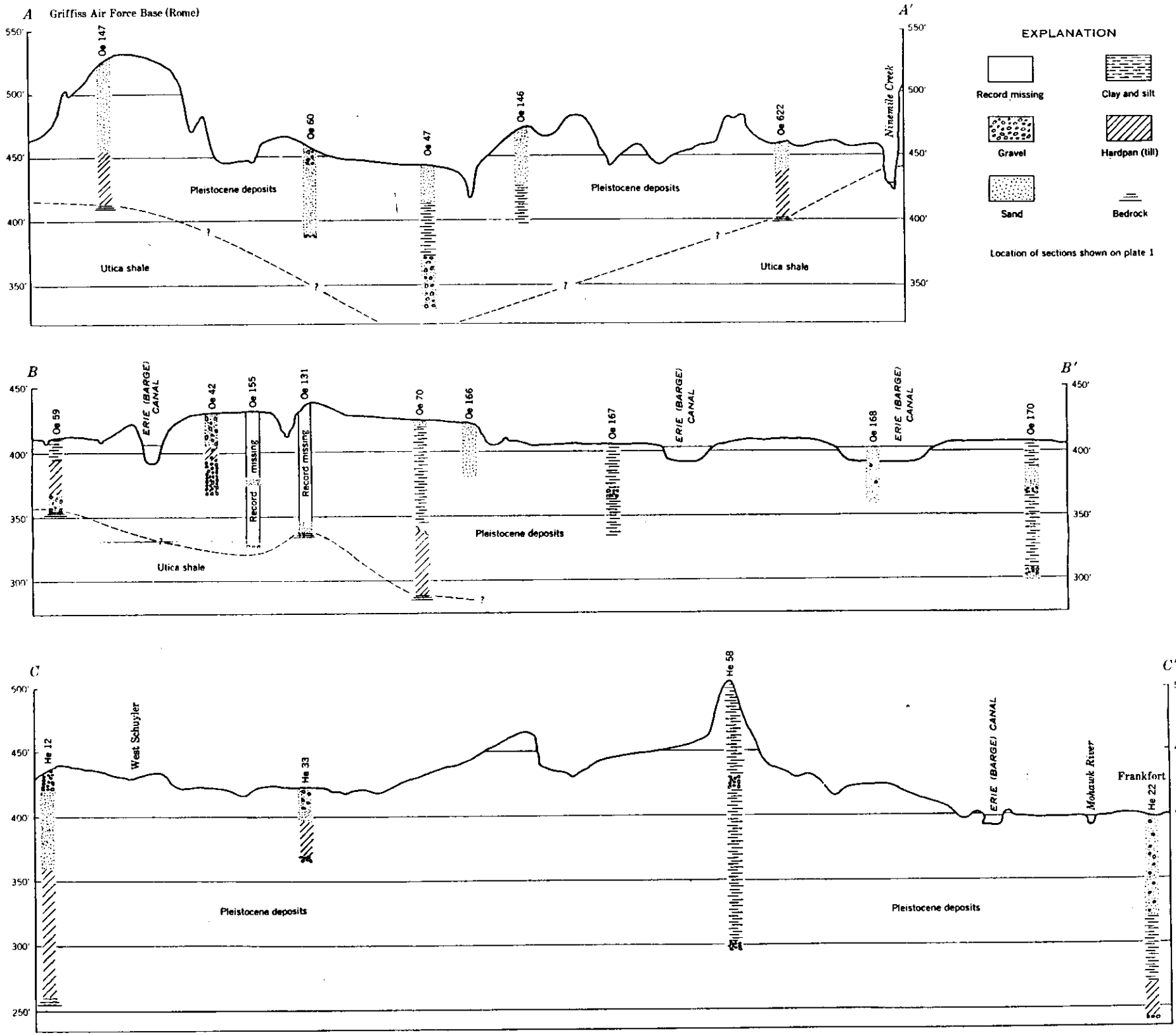
3 of 4

Water Supply Paper
1499-C Plate 2



INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C. 10214

Geology modified from N. C. Dale, 1933 and Marshall Kay and others, 1940–42



Water Supply Paper 1499-C
Plate 3

4 of 4

Appendix 1.4.3-2

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

COMMUNICATIONS RECORD FORM

Distribution: ( ) File DEC-52E Mohawk Landfill ( ) _____
( ) _____, ( ) _____
( ) Author

Person Contacted: Mr. Burrowhagen **Date:** 9/9/85

Phone Number: (315) 866-4170 **Title:** Town Commissioner Mohawk Village

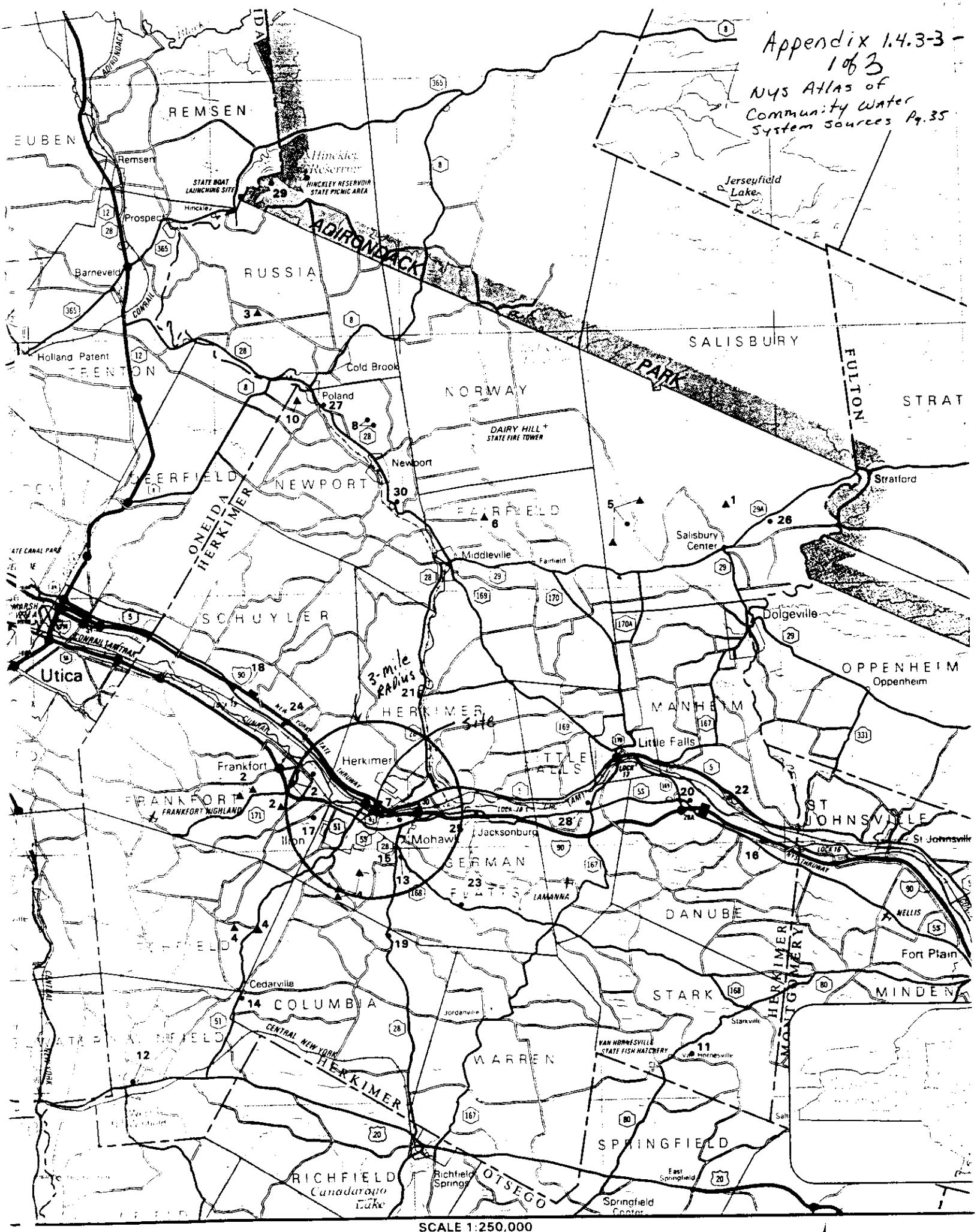
Affiliation: _____ **Type of Contact:** Phone

Address: Municipal Commissioner Mohawk Village **Person Making Contact:** Ellen Bidwell

Communications Summary: I contacted Mr Burrowhagen about the specs on the Mohawk Village supply well. He informed me that the well was 52 feet deep with a static water level of 32' below ground surface.

(see over for additional space)

Signature: Ellen Bidwell


Appendix 1.4.3-3 - 1 of 3
NYS Atlas of Community Water System Sources Pg. 35
REMSEN
Remsen
Hinckley Reservoir
HINCKLEY RESERVOIR STATE PICNIC AREA
STATE BOAT LAUNCHING SITE
Prospect
Barneveld
RUSSIA
ADIRONDACK PARK
Jerseyfield Lake
SALISBURY
FULTON
Holland Patent
Cold Brook
NORWAY
Poland
DAIRY HILL STATE FIRE TOWER
Newport
FAIRFIELD
NEWPORT
Stratford
Middleville
Salisbury Center
ONEIDA
HERKIMER
SCHUYLER
Dolgeville
OPPENHEIM
Oppenheim
Utica
3-mile RADIUS
Site
HERKIMER
MANHEIM
Little Falls
Frankfort
Herkimer
FRANKFORT
FRANKFORT HIGHLAND
Ilion
Mohawk
Jacksonburg
GERMAN FLATTS
LAMANNA
ST JOHNSVILLE
St Johnsville
DANUBE
Fort Plain
Cedarville
COLUMBIA
STARK
MINDEN
Jordanville
Starkville
WARREN
SPRINGFIELD
RICHFIELD
Richfield Springs
Canadarago Lake
OTSEGO
Springfield Center
East Springfield
CENTRAL NEW YORK
MONTGOMERY
SCALE 1:250,000
5 0 5 MILES
NORTH

HERKIMER COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Dolgeville Village	2600	Cold & Mang Brooks
2	Frankfort Village	4325	Moyer Creek, Reservoir, Wells
3	Herkimer Village	9100	Mill Creek Reservoir
4	Ilion Village	9800	Clappsaddle, Hawks, Litchfield & Steele Creeks
5	Little Falls City	8000	Beaver Creek Reservoir, Springs, Spruce Lake
6	Middleville Village	725	Kenyon Brook
7	Mohawk Village	3300	Wells
8	Newport Village	900	Wells (Springs)
9	Old Forge Water District	3000	Independence Lake
10	Poland Village	650	Springs
11	Van Hornsville	120	Wells (Springs)
12	West Winfield Village	2967	Wells
Non-Municipal Community			
13	Brookhaven Trailer Park	36	Wells
14	Cedarhurst Park	35	Wells
15	Creekside Park	25	Wells
16	Danube Trailer Park	21	Wells
17	Delin Estates	95	Wells
18	Elmtree Estates	161	Wells
19	Golden Horseshoe Trailer Park	63	Wells
20	Homestead Trailer Park & Sales	137	Wells
21	Kastbridge Estates	116	Wells
22	Kuyrkendall Court Mobile Home	84	Wells
23	Leatherstocking Estates	77	Wells
24	Miller Grove Trailer Park	217	Wells
25	Mountainview Trailer Park	20	Wells
26	Pinecrest Bible Training Center	NA	Wells
27	Sportsman Trailer Park	70	Wells
28	Sunsetview Mobile Home Park	50	Wells
29	Trails End Campsite	150	Wells
30	White Creek Mobile Home Park	10	Wells

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

Appendix 1.4.3-4
p. 1 of 6

Groundwater and Wells

Second Edition

Fletcher G. Driscoll, Ph.D.
Principal Author and Editor

Published by Johnson Division, St. Paul, Minnesota 55112

255– 257, 259

p 2 of 6

pumped well to a point where the drawdown is measured
S = coefficient of storage (dimensionless)
T = coefficient of transmissivity, in gpd/ft
t = time since pumping started, in days

pumped well to a point where the drawdown is measured
S = coefficient of storage (dimensionless)
T = coefficient of transmissivity, in m^2/day
t = time since pumping started, in days

The well function of u [$W(u)$] originated as a term to represent the heat distribution in a flat plate with a heating element at its center. Theis recognized that this same concept could be applied to the regular distribution of the groundwater head around a pumping well even though water flows toward the point source rather than away from it. The mathematical principles remain the same.

Analysis of pumping test data* using the Theis equation can yield transmissivity and storage coefficients for all nonequilibrium situations. In actual practice, however, the Theis method is often avoided because it requires curve-matching interpretation and is somewhat laborious. In fact, the work of applying the Theis method can be avoided in most cases. For example, if the pumping test is sufficiently long or the distance from the well to where the drawdown is measured is sufficiently small, the $W(u)$ function can be replaced by a simpler mathematical function which makes the analysis easier. The Theis method is developed at the end of this chapter, but at this point the simplified version is examined because it serves well in most cases.

MODIFIED NONEQUILIBRIUM EQUATION

In working with the Theis equation, Cooper and Jacob (1946) point out that when u is sufficiently small, the nonequilibrium equation can be modified to the following form without significant error:

$$s = \frac{264Q}{T}\log\frac{0.3\,Tt}{r^2S} \qquad s = \frac{0.183Q}{T}\log\frac{2.25\,Tt}{r^2S} \qquad (9.6)$$

where the symbols represent the same terms as in Equation 9.5 and 9.5a.

For values of u less than about 0.05, Equation 9.6 gives essentially the same results as Equation 9.5. The value of u becomes smaller as t increases and r decreases. Thus, Equation 9.6 is valid when t is sufficiently large and r is sufficiently small. Equation 9.6 is similar in form to the Theis equation except that the exponential integral function, $W(u)$, has been replaced by a logarithmic term which is easier to work with in practical applications of well hydraulics.

For a particular situation where the pumping rate is held constant, Q, T, and S are all constants. Equation 9.6 shows, therefore, that the drawdown, s, varies with $\log t/r^2$ when u is less than 0.05. From this relationship, two important relationships can be stated:

1. For a particular aquifer at any specific point (where r is constant), the terms s and t are the only variables in Equation 9.6. Thus, s varies as $\log C_1 t$, where C_1 represents all the constant terms in the equation.
2. For a particular formation and at a given value of t, the terms s and r are the

*The performance of newly completed wells is often checked by pumping tests. During the test, the drawdown in the pumping well and observation wells is measured at a constant discharge rate. When properly conducted, these tests yield information on transmissivity and storage capability. See Chapter 16 for a detailed analysis of pumping test procedures.

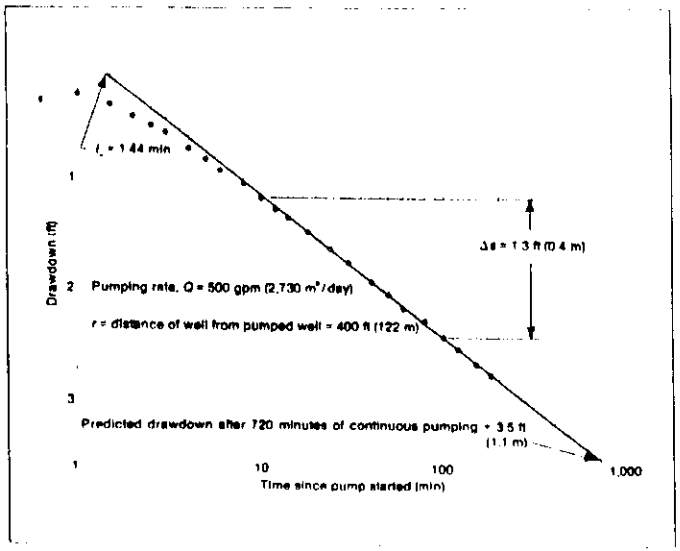


Figure 9.13. When data from Table 9.1 are plotted on semilogarithmic graph paper, most of the plotted points fall on a straight line. The reason for determining Δs and t_0 are explained in the text.

only variables in Equation 9.6. In this case, s varies as $\log C/r^2$, where C represents all the constant terms in the equation, including the specific value of t.

By using these simplified relationships based on Equation 9.6, it is possible to derive information on the hydraulic characteristics of the aquifer by plotting drawdown and time data taken during a pumping test. The data are plotted on semilogarithmic paper* as shown in Figure 9.13. Applying the first of the relationships developed above, time, t, is plotted horizontally on the logarithmic scale; drawdown, s, is plotted vertically on the arithmetic scale. Figure 9.13 shows the data from Table 9.1 plotted as a semilog diagram, where most of the points fall on a straight line.

All the points except those representing measurements made during the first 10 minutes of pumping fit the line. During the first 10 minutes, the value of u is larger than 0.05 and so the modified nonequilibrium equation is not applicable within that phase of the test.

Transmissivity

The coefficient of transmissivity is calculated from the pumping rate and the slope of the time-drawdown graph by using the following relationship developed from Equation 9.6:

*Semilogarithmic graph paper is constructed so that one scale is arithmetic and the other is based on the logarithm of the number being plotted. Thus, a straight-line relationship can be shown to exist between two variables whose relationship is actually changing in time.

$$T = \frac{264\,Q}{\Delta s} \qquad T = \frac{2.3}{4\pi}\frac{Q}{\Delta s} = \frac{0.183\,Q}{\Delta s} \qquad (9.7)$$

where
- T = coefficient of transmissivity, in gpd/ft
- Q = pumping rate, in gpm
- Δs = (read "delta s") slope of the time-drawdown graph expressed as the change in drawdown between any two times on the log scale whose ratio is 10 (one log cycle)

where
- T = coefficient of transmissivity, in m²/day
- Q = pumping rate, in m³/day
- Δs = (read "delta s") slope of the time-drawdown graph expressed as the change in drawdown between any two times on the log scale whose ratio is 10 (one log cycle)

In the example, Δs is 1.3 ft (0.4 m), which is the change in drawdown between 10 minutes and 100 minutes after the start of the pumping test, and Q equals 500 gpm (2,730 m³/day); so:

$$T = \frac{264 \cdot 500}{1.3} = 102{,}000 \text{ gpd/ft} \qquad T = \frac{0.183 \cdot 2{,}730}{0.4} = 1{,}250 \text{ m}^2\text{/day}$$

Table 9.1. Drawdown Measurements in an Observation Well 400 ft (122 m) from Pumped Well

Time since pump started, in min	Drawdown, s		Time since pump started, in min	Drawdown, s	
	ft	m		ft	m
1	0.16	0.05	24	1.58	0.48
1.5	0.27	0.08	30	1.70	0.52
2	0.38	0.12	40	1.88	0.57
2.5	0.46	0.14	50	2.00	0.61
3	0.53	0.16	60	2.11	0.64
4	0.67	0.20	80	2.24	0.68
5	0.77	0.23	100	2.38	0.73
6	0.87	0.27	120	2.49	0.76
8	0.99	0.30	150	2.62	0.80
10	1.12	0.34	180	2.72	0.83
12	1.21	0.37	210	2.81	0.86
14	1.30	0.40	240	2.88	0.88
18	1.43	0.44			

Coefficient of Storage

The coefficient of storage is also readily calculated from the time-drawdown graph by using the zero-drawdown intercept of the straight line as one of the terms in the equation. The following equation is derived from Equation 9.6:

$$S = \frac{0.3\,Tt_0}{r^2} \qquad S = \frac{2.25\,Tt_0}{r^2} \qquad (9.8)$$

where
- S = storage coefficient

where
- S = storage coefficient

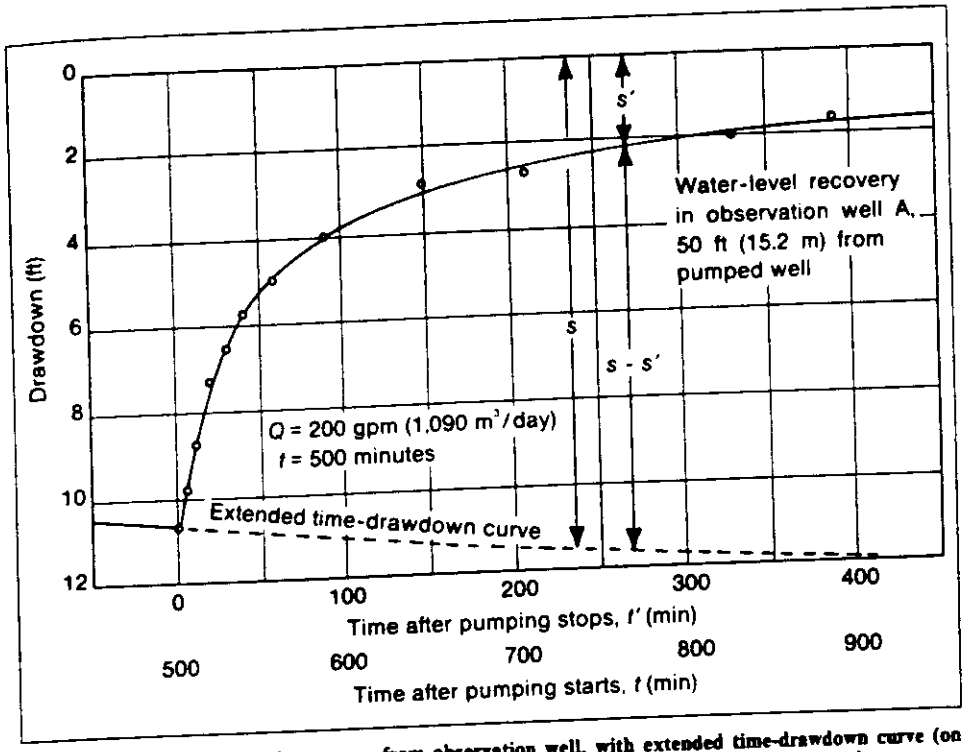


Figure 9.39. Residual-drawdown curve from observation well, with extended time-drawdown curve (on arithmetic scales) showing how calculated recovery is determined at any instant during the recovery period. Producing well pumped 200 gpm (1,090 m³/day) for 500 minutes.

retically, the drawdown and recovery plots should be identical if the aquifer conditions conform to the basic assumptions of the Theis concept.

The time-recovery data from the pumped well can also be plotted by using the method applied to the observation well. The time-recovery plot for the pumped well is more accurate than its time-drawdown plot because the residual-drawdown measurements are more accurate. During the recovery period, water-level measurements can be made without being affected by pump vibrations and momentary variations in the pumping rate.

In analyzing the time-recovery plot, its slope is of primary interest. Two factors determine the slope of the straight line in Figure 9.40. One is the average pumping rate during the preceding pumping period, the other is the aquifer transmissivity.

In Figure 9.40, the slope of the straight line is expressed numerically as the change in the water-level recovery per logarithmic cycle. It is designated by $\Delta(s - s')$. Its value in Figure 9.40 is 5.2 ft (1.6 m), which is the recovery during the period from 10 minutes to 100 minutes after pumping stopped.

The next step is to calculate the transmissivity of the aquifer from the following equation:

$$T = \frac{264\,Q}{\Delta\,(s - s')} \qquad T = \frac{0.183\,Q}{\Delta\,(s - s')} \qquad (9.14)$$

Note that this equation is similar to Equation 9.7. Figure 9.40 shows the value of T to

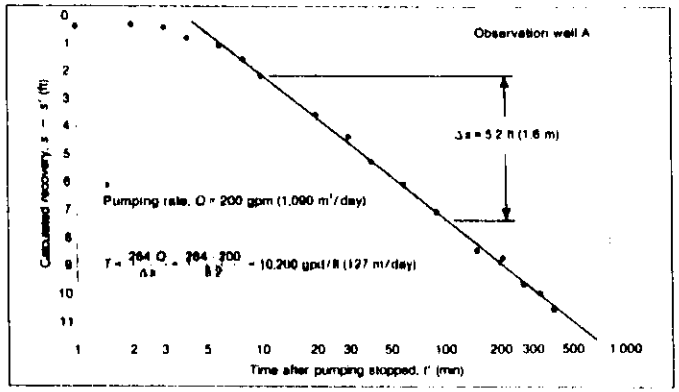


Figure 9.40. Time-recovery plot for observation well becomes a straight line when plotted on a semilog diagram, similar to the time-drawdown diagram for the preceding pumping period.

be about 10,200 gpd/ft (127 m²/day), which may be compared with T as calculated from the time-drawdown data plotted in Figure 9.25. If test conditions meet the required standards and measurements are taken carefully, the two results should agree reasonably well.

A second method of plotting the data permits direct use of the residual drawdown without calculating the recovery from an extension of the time-drawdown plot. It can be shown that the residual drawdown is related to the logarithm of the ratio t/t' as follows:

$$s' = \frac{264\,Q}{T} \log t/t' \qquad s' = \frac{0.183\,Q}{T} \log t/t' \qquad (9.15)$$

Mathematical development of this relationship is given in Appendix 9.D.

This equation shows that when values of s' are plotted against corresponding values of t/t' on semilogarithmic graph paper, a straight line can be drawn through the plotted points. Figure 9.41 shows the data from Table 9.4 plotted on a semilog diagram, with s' indicated on the vertical arithmetic scale and t/t' on the horizontal logarithmic scale. The transmissivity is then calculated from the following equation:

$$T = \frac{264\,Q}{\Delta s'} \qquad T = \frac{0.183\,Q}{\Delta s'} \qquad (9.16)$$

Note from Figure 9.41 that time during the recovery period increases toward the left in this method of plotting, whereas on the time-drawdown and time-recovery plots time increases toward the right.

The residual-drawdown plot as shown in Figure 9.41 is preferred over the recovery plot, Figure 9.40, for calculating transmissivity. The method shown in Figure 9.41 provides a more independent check on the results calculated from the pumping period.

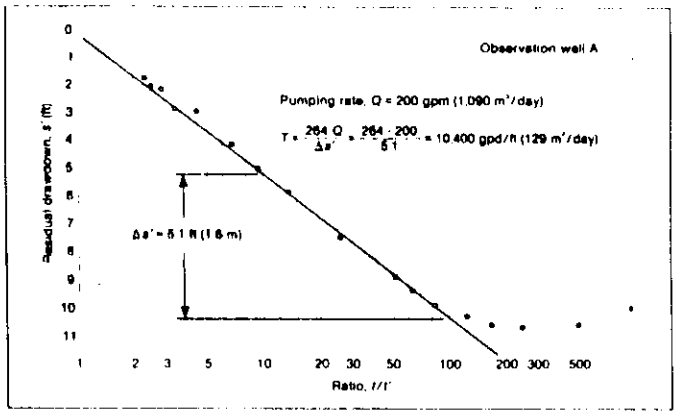


Figure 9.41. Residual drawdown plotted against the ratio t/t' becomes a straight line on semilog graph and permits calculation of transmissivity as shown. Time during recovery period increases toward the left in this diagram.

The method used in Figure 9.40 depends upon extension of the time-drawdown plot through the recovery period; thus, the drawdown plot itself determines the values used in the recovery plot, and any inaccuracies in the drawdown plot are projected into the recovery plot.

If no observation well is available, the recovery data from the pumped well usually provide the best basis for calculating the transmissivity of the aquifer. The residual-drawdown plot, as shown in Figure 9.41, should always be used in such a case.

Determining Storage Coefficient Using Recovery Data

If measurements are made in at least one observation well during the recovery period, the storage coefficient can be calculated from portions of these data. The data must be plotted as shown in Figure 9.40. The residual-drawdown plot cannot be used for determining the storage coefficient, even though that plot is valid for calculating the transmissivity.

Figures 9.42 and 9.43 show the similarity in calculations of the storage coefficient from time-drawdown and time-recovery diagrams. Using Equations 9.7 and 9.8, the time-drawdown data for an observation well, shown in Figure 9.42, give values of T = 13,000 gpd/ft (161 m²/day) and $S = 5.7 \times 10^{-4}$, respectively. Parallel calculations from Figure 9.43 using $\Delta(s - s')$ in place of Δs and t'_o in place of t_o give values of T = 13,700 gpd/ft (170 m²/day) and $S = 4.4 \times 10^{-4}$, respectively. These two sets of results are considered to be in reasonable agreement.

It is apparent from the residual-drawdown curve in Figure 9.41 that t'_o cannot be obtained from that diagram. The horizontal scale represents a ratio without units. The intercept of this curve at zero drawdown has an entirely different significance on this graph. It is necessary to review the basic assumptions listed on page 218 that were used in developing the equations for both the pumping period and the recovery period

p 5 of 6

A study of residual-drawdown curves from actual aquifer tests reveals that the curve does not always pass through this point, called the origin of the diagram. When the curve fails to pass through the origin, it is concluded that the aquifer conditions do not conform to the assumed idealized conditions.

Three ways in which the conditions differ from the theoretical aquifer may be indicated by the residual-drawdown plot. If the graph indicates zero drawdown at a t/t' value of 2 or more, it is concluded that some recharge water reached the aquifer during the pumping period. The result of the recharge is to bring about full recovery to the original static level during a relatively short recovery period, long before t/t' approaches 1. The upper plot in Figure 9.44 might be obtained for such a situation.

A different condition is indicated when the plot extended to the left shows a residual drawdown of several inches or more as t/t' approaches 1. This situation would occur in an aquifer of limited extent with no recharge, when pumping permanently lowers the static water level. The lowest plot in Figure 9.44 illustrates this type of result.

The third condition that can account for minor displacement of the residual drawdown plot results from a variation in the storage coefficient, S. In theory, the storage coefficient is assumed to be constant during both the pumping period and the recovery period of the test. In practice, however, S probably varies and is apt to be greater during the pumping period than during the subsequent recovery (Jacob, 1963).

The value of S for a confined aquifer depends upon the elastic properties of the formation. If the aquifer is not perfectly elastic, it does not rebound vertically during recovery of water levels (recovery of pressure) at the same rate that it is compressed as a result of the drawdown during the preceding pumping.

During pumping from an unconfined aquifer, air occupies the voids in the sands within the cone of depression, because that part of the formation is actually dewatered. The volume of water drained per cubic foot of the formation is the value of S. When pumping is stopped, the rising water table may trap some of the air as bubbles in the

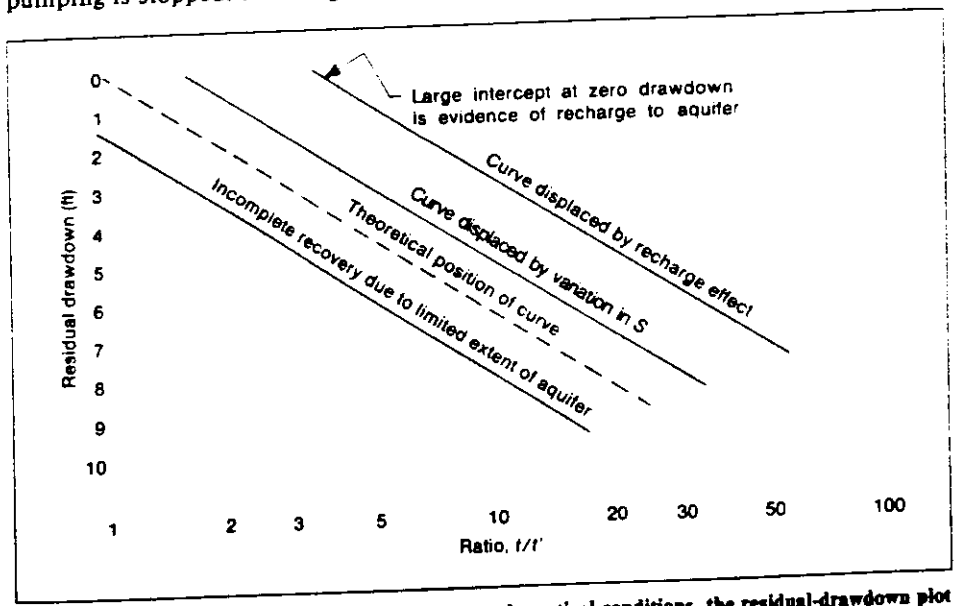


Figure 9.44. When real aquifer conditions differ from theoretical conditions, the residual-drawdown plot may be displaced in any of the three ways shown in this diagram.

Appendix 1.4.4-1
1 of 2

Darragh Swerdowski

0717

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

New File
Hazardous Waste Site
Ilion Landfill

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

LAB ACCESSION NO: 04799 YR/MO/DAY/HR SAMPLE REC'D: 79/11/27/11

REPORTING LAB: 10 EHC ALBANY
PROGRAM: 65C SOLID WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: NY GAZETTEER NO: 2154 COUNTY: HERKIMER
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: DEWATERING GROUNDWATER OF ILION DUMP 200

EXACT SAMPLING POINT: DEWATRING GROUNDWATER OF ILION DUMP 200' S. INCIN
TYPE OF SAMPLE: 24 LEACHATE
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 11/26/15
REPORT SENT TO: CO (1) PO (2) LPHE (0) LHO (0) FED (0) CHEM (0)

		PARAMETER	UNIT	RESULT	stmds	NOTATION
002901		HYDROLYZABLE CYANIDES	MG/L	0.015	0.2	
009701	*	CADMIUM	MG/L	0.02	0.01	LT
009801	*	CHROMIUM, (ALL VALENCES)	MG/L	0.1	0.05	LT
009901		COPPER	MG/L	0.05	1.0	LI
010101	*	LEAD	MG/L	0.1	~~0.05~~ .05	
010901		ZINC	MG/L	0.03	5.0	
010001	*	IRON	MG/L	7.8	0.3	

* exceeds groundwater limits

RECEIVED
JAN 8 1980
NYS Dept. of Environmental Conservation
REGION 5
ENGINEER

RECEIVED
NOV 15 1984
BUREAU OF HAZARDOUS SITE CONTROL
DIVISION OF SOLID AND
HAZARDOUS WASTE

DATE COMPLETED: 12/14/79

NYS DEPT. OF ENVIRONMENTAL CONSERVATION
UTICA STATE OFFICE BUILDING
207 GENESEE STREET
UTICA, N.Y. 13500

SUBMITTED BY: KEELTY

2 of 2 Darryll Swerdowski

0272

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

LAB ACCESSION NO: 01436 YR/MO/DAY/HR SAMPLE REC'D: 79/11/27/10

REPORTING LAB: 17 EHC ALBANY
~~PROGRAM: 650 SOLID WASTES~~
STATION (SOURCE) NO:
DRAINAGE BASIN: NY GAZETTEER NO: 2101 COUNTY: HERKIMER
COORDINATES: DEG ' "N. DEG ' "W
COMMON NAME INCL SUBW'SHED: 200' SOUTH INCINERATOR & 150' NE ILION GARAGE GERMAN FLATTS ILION
EXACT SAMPLING POINT: DEWATERING GROUNDWATER OF ILION DUMP 200' S INCIN
TYPE OF SAMPLE: 24 LEACHATE
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 11/26/15
REPORT SENT TO: CO (1) RO (1) LPHE (1) LHO (0) FED (0) CHEM (0)

PARAMETER		UNIT	RESULT	NOTATION
007310	GASOLINE	MCL/L	PRES.	
007410	KEROSENE	MCL/L		ND
007510	OIL LUBRICATING	MCL/L		ND
007610	OIL FUEL	MCL/L		ND
034409	BENZENE	MCG/L	1.	
034509	XYLENES	MCG/L	10.	
039209	TOLUENE	MCG/L	20.	

DATE COMPLETED: 12/18/79

NYS DEPT. OF ENVIRONMENTAL CONSERVATION
UTICA STATE OFFICE BUILDING
207 GENESEE STREET
UTICA, N.Y. 13500

SUBMITTED BY: NOT GIVEN

Appendix 1.4.4-2
1 of 3
Source

WARD ASSOCIATES, P.C. Landscape Arch

45 West Main Street Little Falls, New York 13365

August 27, 1980

MR. BERT MEADE
Department of Environmental Conservation
Watertown, New York 13601

Re: Ilion Community Park Project
Ilion, New York

Dear Sir:

As per our August 11, 1980 meeting with Daryl Swerdewski of DEC at the above mentioned site, the attached water sample tests have been taken. The results of these tests were called in to your office by phone on August 22, 1980 and relayed to Mr. Robert Gudeon in your department.

The Phase I project includes two softball fields, three tennis courts, game areas and a parking field. Attached, you will find a site plan of same.

We would request your review of the above and welcome any recommendations that you might have.

Very truly yours,
WARD ASSOCIATES, P.C.,

Anthony D. Carlisto, P.E.
Vice-President

ADC/b

cc:Charles Haggerty/Village Administrator, Ilion
James Schaeffer, PhD., Chairman Herkimer-Oneida Toxic Waste Committee

ENVIRONMENTAL ENGINEERING

TEST REPORT

DATE: August 20, 1980

CLIENT:
Town of Ilion
Mr. Charles Haggerty
Town of Ilion
Ilion, NY 13357

SAMPLE SUBMITTED: One (1) water sample submitted for the following analyses:

Cyanide	Lead	Benzene
Phenol	Iron	Xylene
Chromium	Cadmium	Toulene

METHODS:

Cyanide:	ASTM D2036-75		
Phenol:	ASTM 1783-70		
Chromium:	Atomic Absorption	218.1	EPA
Lead:	" "	239.1	EPA
Iron:	" "	236.1	EPA
Cadmium:	" "	213.1	EPA

RESULTS:

Phenol	-	0.032	milligrams/liter (ppm)
Cyanide	-	0.008	" " - .05
Chromium	-	0.089	" "
Lead	-	0.303	" "
Iron	-	11.330	" "
Cadmium	-	0.013	" "

For Benzene, Toulene and Xylene, the results will follow on another report.

LABORATORY CHEMIST:

Conrad Teufel Jr.
CONRAD TEUFEL, JR.

[illegible]

ENVIRONMENTAL ENGINEERING

TEST REPORT

FOLLOW-UP REPORT

DATE: August 27, 1980

CLIENT: Town of Ilion
Mr. Charles Haggerty
Town of Ilion
Ilion, NY 13357

SAMPLE SUBMITTED: One (1) water sample submitted for the following analyses:

Cyanide (sent results 8/20)
Phenol (" " ")
Chromium (" " ")
Lead (" " ")
Iron (" " ")
Cadmium (" " ")
Benzene (results below)
Xylene (" ")
Toluene (" ")

RESULTS:

Benzene - < 5.0 μg/l (micrograms per liter)

Toluene - < 5.0 μg/l (micrograms per liter)

Xylene - < 5.0 μg/l (micrograms per liter)

LABORATORY CHEMIST: Conrad Teufel Jr.
Conrad Teufel Jr.

[illegible]

In accepting this report, the customer agrees that the full extent of any and all liability for both actual and/or consequential damages of Environmental Engineering for the services performed shall be a sum equal to the fee charged to the customer for the services as liquidated damages.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SOLID AND HAZARDOUS WASTE

INACTIVE HAZARDOUS WASTE DISPOSAL SITE REPORT

PRIORITY CODE: _____ SITE CODE: 622004

NAME OF SITE: Ilion Landfill REGION: 6

STREET ADDRESS: East Street

TOWN/CITY: Ilion COUNTY: Herkimer

NAME OF CURRENT OWNER OF SITE: Village of Ilion

ADDRESS OF CURRENT OWNER OF SITE: City Hall, Morgan Street, Ilion, New York 13357

TYPE OF SITE: OPEN DUMP [X] STRUCTURE [ ] LAGOON [ ]
LANDFILL [ ] TREATMENT POND [ ]

ESTIMATED SIZE: 25 ACRES

SITE DESCRIPTION:

The site is an inactive open dump in the Village of Ilion bordered by the Mohawk River/Barge Canal to the north, wetlands to the east and residential property to the south. An incinerator on site was used to burn wastes. The site is currently used by the Village of Ilion for its Department of Public Works office and garage.

Ballfields and tennis courts were constructed on the site in 1980.

HAZARDOUS WASTE DISPOSED: CONFIRMED [ ] SUSPECTED [X]

TYPE AND QUANTITY OF HAZARDOUS WASTES DISPOSED:

TYPE	QUANTITY (POUNDS, DRUMS, TONS, GALLONS)
None documented	

TIME PERIOD SITE WAS USED FOR HAZARDOUS WASTE DISPOSAL: None documented

_____, 19 ___ TO _____, 19 ___

OWNER(S) DURING PERIOD OF USE: _____

SITE OPERATOR DURING PERIOD OF USE: _____

ADDRESS OF SITE OPERATOR: _____

ANALYTICAL DATA AVAILABLE: AIR ☐ SURFACE WATER ☒ GROUNDWATER ☒
SOIL ☐ SEDIMENT ☒ NONE ☐

CONTRAVENTION OF STANDARDS: GROUNDWATER ☒ DRINKING WATER ☐
SURFACE WATER ☐ AIR ☐

SOIL TYPE: Silt, clay, and fine sand

DEPTH TO GROUNDWATER TABLE: 0-5 feet

LEGAL ACTION: TYPE: None known STATE ☐ FEDERAL ☐

STATUS: IN PROGRESS ☐ COMPLETED ☐

REMEDIAL ACTION: PROPOSED ☐ UNDER DESIGN ☐
IN PROGRESS ☐ COMPLETED ☐

NATURE OF ACTION: _____

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

None known.

ASSESSMENT OF HEALTH PROBLEMS:

None known.

PERSON(S) COMPLETING THIS FORM:

FOR NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NAME EA Science and Technology

TITLE _____

NAME _____

TITLE _____

DATE: 9 May 1986

NEW YORK STATE DEPARTMENT OF HEALTH

NAME _____

TITLE _____

NAME _____

TITLE _____

DATE: _____