YO-7080 D2834

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

PHASE II INVESTIGATIONS

97th Street Methodist Church (Site Number 932084A) City of Niagara Falls, Niagara County

December 1990

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., Director

Prepared by:

Ecology and Environment Engineering, P.C.

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PHASE II INVESTIGATIONS

97th Street Methodist Church, Site Number 932084A
City of Niagara Falls, Niagara County

STATE OF NEW YORK
GERALD A. STROBEL
LICENSE NO. 044479-1
LICENSED PROFESSIONAL ENGINEER

Prepared for:

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233
Thomas C. Jorling, Commissioner

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1. EXECUTIVE SUMMARY

1.1 SITE DESCRIPTION AND BACKGROUND

The 1-acre 97th Street Methodist Church site is located in the City of Niagara Falls, Niagara County, New York, at 9610 Colvin Boulevard between 96th and 97th Streets (see Figure 1-1). The site consists of a church building and small garage surrounded by flat, open grass, concrete, and blacktopped areas (see Figure 1-2). The church building is secured with locked entrances and boarded-up windows. The grounds surrounding the building are accessible to the public (i.e., no fences). Located within the semi-inhabited area of Love Canal, the Love Canal Emergency Declaration Area, private residences surround the site to the west, north, and east. The area to the south of the site is the fenced secured area of Love Canal, containing the clay cap and the storage of all excavated materials.

The site has been owned by the Love Canal Area Revitalization Agency (LCARA) since February 28, 1989 and was purchased from the Western New York Conference which had occupied the site since 1961. Prior to 1961, the site was undeveloped and owned by Mary Anne Nye Johnston and Mabel George. In August and September of 1958, Olin Chemical allegedly disposed of 23 tons of broken concrete reactor cells. The materials reportedly were contaminated with mercury. No other incidents of waste disposal are known or reported to have occurred at this site.

The actual disposal of these materials at the site is questionable. According to representatives from Olin Chemical, the broken concrete reactor cells were disposed of at the 99th Street Methodist Church in 1958. The church congregation later moved to the 97th Street location.

The site has been monitored by the United States Environmental Protection Agency (EPA), United States Geological Survey (USGS), and New York State Department of Environmental Conservation (NYSDEC) through collection of groundwater and subsurface soil samples prior to this current investigation. In 1980, two monitoring wells (one overburden and one bedrock) were installed and sampled by EPA as part of the Love Canal investigation and remedial action program. Only low concentrations of pesticides were detected. Through this Phase II Investigation, it was shown that these wells are upgradient of the site.

In August 1982, USGS drilled four test borings (one in each corner) at the site. Soil samples were taken from each borehole and a groundwater sample was taken from one of the boreholes. Three organic compounds were detected in the groundwater sample: diethylphthalate, butylbenzlphltalate, and bis(2-ethylhexyl)phthalate. These compounds are common laboratory contaminants and it is not known whether they were attributable to site contamination. The only inorganic compound detected in the soil samples was iron.

In 1984, NYSDEC sampled the two EPA wells and found elevated levels of pesticides, polynuclear aromatic hydrocarbons (PAHs), and zinc. In May and September of 1989, the EPA wells were sampled again by NYSDEC and only elevated levels of lead were found.

The Phase I investigation report of the site was submitted to NYSDEC by Engineering Science (ES) and Dames and Moore (D&M) in January 1986. The Phase II investigation (as described in Section 1.2 below) was initiated on October 11, 1989 with a site reconnaissance performed by Ecology and Environment Engineering, P.C. (E & E) under contract with NYSDEC.

1.2 PHASE II INVESTIGATION

As part of the Phase II investigation, E & E performed or supervised the performance of the following tasks:

- An initial site reconnaissance on October 11, 1989, including a continuous air monitoring survey using an HNu photoionizer and mercury vapor analyzer;
- A geophysical survey on October 24 and 25, 1989, consisting of shallow seismic refraction and ground penetrating radar (GPR);

- Installation of four groundwater monitoring wells (three overburden and one bedrock) between November 29 and December 7, 1989;
- Sampling of surface and subsurface soils on December 1 and 4, 1989;
- Digging of three test pits in areas suspected to contain concrete reactor cells on December 18, 1989;
- Sampling of groundwater on January 8 and 10, 1990, from both existing and new on-site monitoring wells; and
- Surveying of all sample locations, site features, and geophysical survey lines on February 23, 1990.

1.3 SITE ASSESSMENT

The continuous air monitoring survey performed during the site reconnaissance indicated the absence of organic and mercury vapors above background from all areas on site including the existing monitoring wells, storm sewers, underground storage tank vents, etc. The geophysical surveys provided information to characterize the subsurface and locate potential areas that may contain the buried concrete reactor cells. Specifically, the seismic survey indicated that the overburden consists of two distinct layers (fill or sediments followed by saturated clays and tills) overlying bedrock which ranged in depth from 27 to 40 feet and the GPR survey indicated the possible presence of concrete cells underlying the blacktop parking lot.

The subsurface stratigraphy underlying the site, as confirmed by the installation of the groundwater monitoring wells, consists of sandy, clayey silt at the surface. Overlying the top of the bedrock are multiple layers of silt and clay (exhibiting evidence of desiccation cracks), clay, silt and clay, and silty, clayey sand. The overburden thickens 5 to 10 feet from south to north across the site as indicated by the seismic survey. The bedrock beneath the site is Lockport Dolomite, of which the top 5 feet are weathered and heavily fractured (mostly horizontal, but some vertical) to a depth of 40 feet as indicated in the rock core from groundwater monitoring well GW-3257.

There are two water bearing zones. The shallow water table, with an apparent flow to the southwest, has a depth of approximately 2.5 to 7 feet below ground surface. The potentiometric surface of the bedrock water table is at a depth of approximately 9 feet below ground surface. The bedrock aquifer may be semi-confined or confined by the overlying silt and clay layers, thus creating a potentiometric surface. Groundwater flow in the bedrock cannot accurately be determined due to the insufficient number of on-site bedrock wells; however, the water table was relatively flat based upon the wells in the southwest and northeast corners of the site. Groundwater flow in the vicinity of the site is most likely influenced by a groundwater pump treatment station in the fenced area of Love Canal directly south of the site.

Six groundwater samples and one drill water sample were collected and analyzed for Target Compound List (TCL) organic compounds, including volatile organics, base/neutral and acid extractables (BNAs), and pesticides/polychlorinated biphenyls (PCBs). In addition, these samples were analyzed for the inorganic portion of the TCL list, including metals and cyanide. One volatile organic compound (total xylenes) was detected in GW-3257, and six BNAs (1,4-dichlorobenzene; n-nitroso-di-n-propylamine; 1,2,4-trichlorobenzene; 2,4-dinitrotoluene) and two PAHs were detected below sample quantification limits in GW-3159. Two metals (iron and manganese) exceeded NYSDEC groundwater standards in all the wells tested and total lead levels exceeded NYSDEC standards in GW-3257. Dissolved iron did not exceed standards in GW-3251, GW-3155, and GW-3159; dissolved manganese did not exceed standards in GW-3251 and GW-3257; and dissolved lead was undetected in GW-3257. No PCBs/pesticides or cyanide were detected in any of the groundwater samples.

Six surface soil and seven subsurface soil samples were collected and analyzed for the same TCL organics and inorganics. The surface soil samples were collected from various areas surrounding the church building. One subsurface sample was collected from each of three soil borings (GW-3155, GW-3257, and GW-3159) and three test pits, and two were collected approximately 2 feet below the blacktop parking lot. A subsurface soil sample was not collected from the GW-3157 soil boring because it was adjacent to GW-3257.

Two volatile organic compounds (trichloroethene and 1,1,2,2-tetrachloroethane) were detected in GW-3257 at a depth of 2-4 feet and one (tetrachloroethene) was detected below sample quantification limits. Several BNAs including isophorone, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, dibenzofuran, decamethylcyclopentasiloxane, and numerous PAHs were detected below sample quantification limits in the surface soil and two subsurface soil samples at a depth of 0-2 feet. PAHs were also detected below sample quantification limits in the Test Pit 1 subsurface soil sample. Three inorganics--calcium, chromium, and cobalt--exceeded concentration ranges of natural soils in the eastern United States (Shacklette and Boerngen 1984). No PCBs/pesticides or cyanide were detected in any of the soil samples.

1.4 HAZARD RANKING SYSTEM SCORE

The Hazard Ranking System (HRS) score was compiled to quantify risks associated with the site. The HRS is applied to inactive hazardous waste sites in New York State to prioritize those needing additional investigation and remediation. The system evaluates site characteristics, containment measures, waste types, and potential contaminant receptors.

In the HRS, three numerical scores are computed to express the relative risk to the population and the environment represented by the site. The three scores are described below:

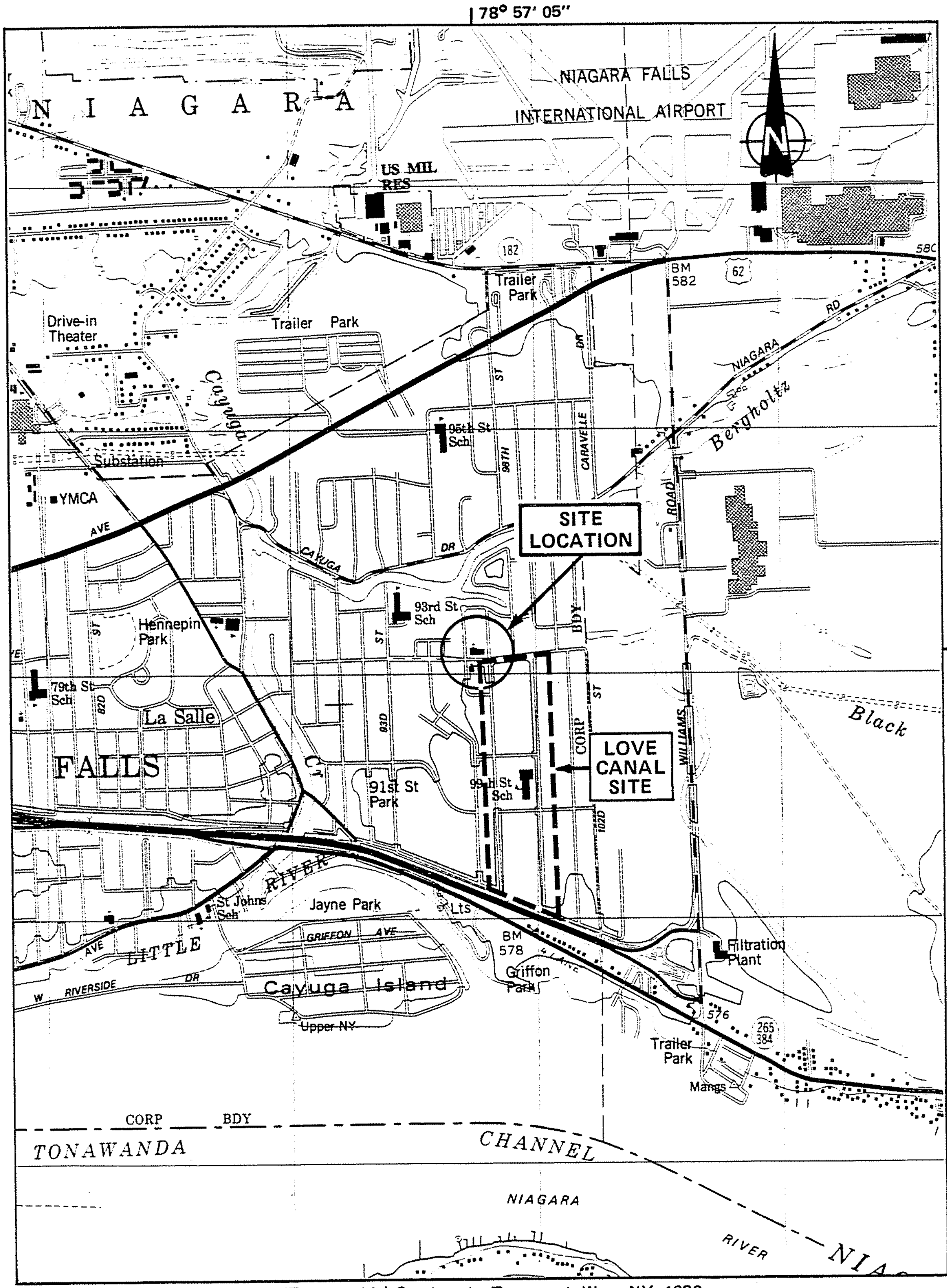
- o S_M reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility via groundwater, surface water, or air. It is a composite of separate scores for each of the three routes (S_{gw} = groundwater route score, S_{sw} = surface water route score, and S_a = air route score).
- o S_{FE} reflects the potential for harm from substances that can explode or cause fires.
- o S_{DC} reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

Based on the results of this and previous studies, the HRS scores for the 97th Street Church site have been calculated as follows:

S_M = 5.19 (S_{gw} = 4.47; S_{sw} = 7.79; S_a = 0)

S_{FE} = Not scored

S_{DC} = 0



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle, Tonawanda West, NY, 1980.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 1—1
LOCATION MAP: 97th STREET METHODIST CHURCH SITE

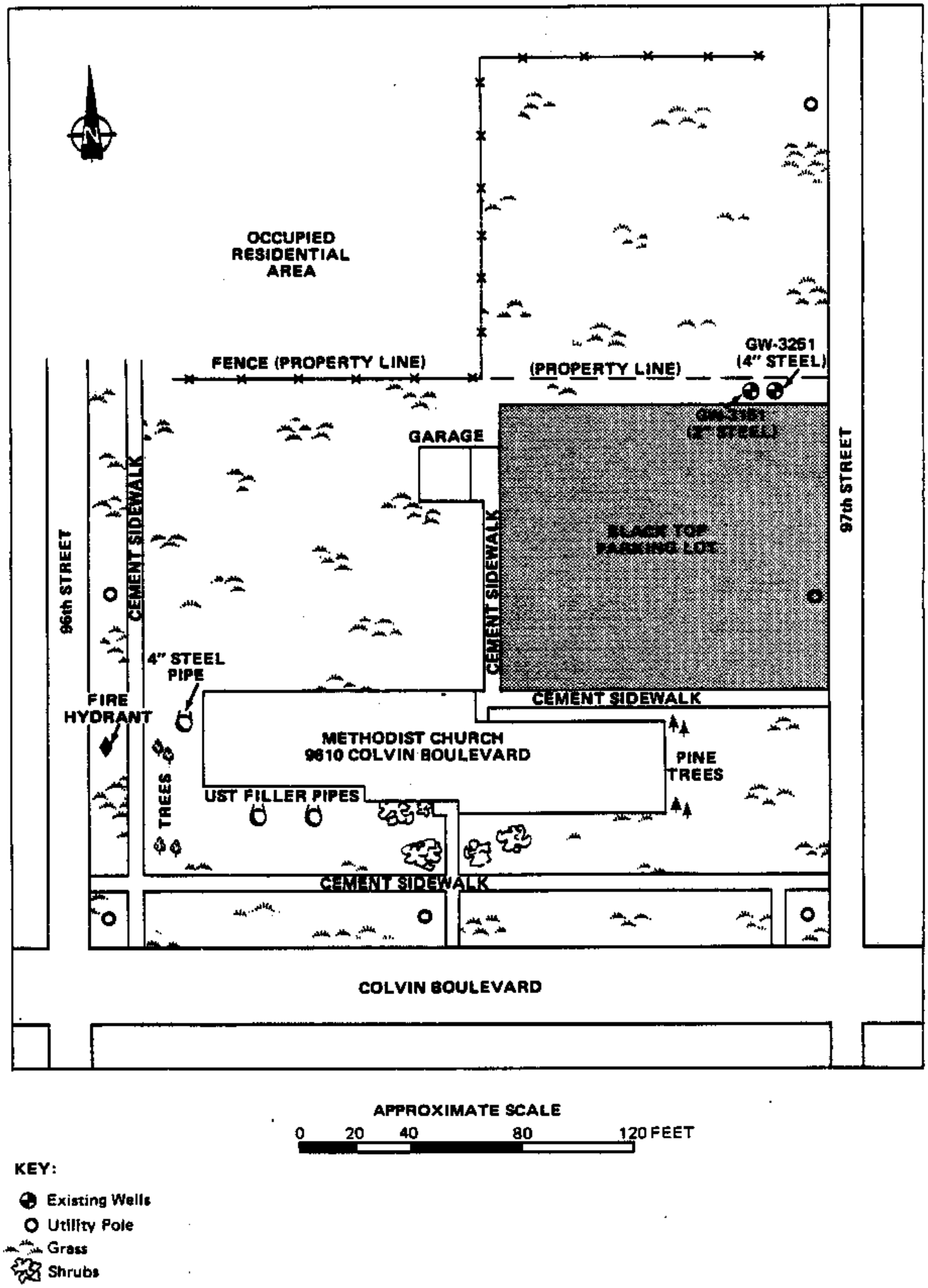


Figure 1–2
SITE SKETCH: 97th STREET METHODIST CHURCH SITE

47-15-25 (11/90)-9d

Original-BHSC
Copy-REGION
Copy-DEE
Copy-DOH
Copy-PREPARER

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

ADDITIONS/CHANGES TO REGISTRY OF INACTIVE HAZARDOUS WASTE DISPOSAL SITES

1. Site Name	2. Site Number	3. Town	4. County
97th Street Methodist Church	932084A	Niagara Falls	Niagara

5. Region	6. Classification	7. Activity
9	Current 2a /Proposed D1	[ ] Add [ ] Reclassify [X] Delist [ ] Modify ______

8a. Describe location of site (attach USGS topographic map showing site location).
The site is located on the north side of Colvin Blvd. between 96th and 97th Streets in Niagara Falls, New York (see Figure 1-1 of the Phase II Investigation Report).

b. Quadrangle Tonawanda West c. Site latitude 43°05'51" Longitude 78°57'05" d. Tax Map Number 161.10-5-53

9a. Briefly describe the site (attach site plan showing disposal/sampling locations)
The site consists of an abandoned church building, garage, and black-top parking lot. Surrounding areas are covered with grass. Figure 3-2 of the Phase II Investigation Report shows site plan included well, test pit, and sample locations.

b. Area 1 acres c. EPA ID number ______________ d. PA/SI [ ] Yes [ ] No

e. Completed: [X] Phase I [X] Phase II [ ] PSA [X] Sampling

10. Briefly list the type and quantity of the hazardous waste and the dates that it was disposed of at this site.

Alleged 23 tons of broken concrete reactor cells containing mercury and possibly lead were disposed by Olin Chemical in August and September 1988.

11a. Summarized sampling data attached

[ ] Air [X] Groundwater [ ] Surface Water [X] Soil [ ] Waste [X] EP Tox [ ] TCLP

b. List contravened parameters and values

12. Site impact data

a. Nearest surface water: Distance 900 ft. Direction North Classification D

b. Nearest groundwater: Depth 2.38 ft. Flow direction Southwest [ ] Sole source [ ] Primary [ ] Principal

c. Nearest water supply: Distance 3,500 ft. Direction West Active [X] Yes [ ] No

d. Nearest building: Distance 150 ft. Direction North Use Residence

e. Crops/livestock on site? [ ] Yes [X] No

f. Exposed hazardous waste? [ ] Yes [X] No

g. Controlled site access? [ ] Yes [X] No

h. Documented fish or wildlife mortality? [ ] Yes [X] No

i. Impact on special status fish or wildlife resource? [ ] Yes [X] No

j. Within a State Economic Development Zone? [ ] Yes [X] No

k. For Class 2A: Code ______ Health model score ______

l. For Class 2: Prority category ______________

m. HRS Score Sm = 5.19

n. Significant threat [ ] Yes ______ [X] No
[ ] Unknown

13. Site owner's name	14. Address	15. Telephone Number
Love Canal Revitalization Agency	Niagara Falls, New York	(716) 297-9637

16. Preparer
Gene Florentino, Geologist, Ecology and Environment Engineering, P.C.
Name, title, and organization

12/20/90
Date

Gene Florentino Geologist Ecology & Env. Eng. P.C.
Signature

17. Approved

Name, title, and organization

Date

Signature

02[UZ]YO7080:D2834/4286

2

2. PURPOSE

This Phase II investigation was conducted under contract to the NYSDEC Division of Hazardous Waste Remediation, Bureau of Hazardous Site Control. The purpose of the investigation was to determine if hazardous wastes have been disposed of at the site; if contaminants exist in the various media; if contaminants are leaving the 97th Street Methodist Church site; and whether or not threats to human health and/or the environment exist.

The Phase II investigation was designed to supplement existing data for the site and update the HRS score. Previous investigations conducted by EPA in 1980, USGS in 1982, NYSDEC in 1984, ES and D&M in 1986, and NYSDEC in 1988 have shown low concentrations of iron in the soil and low concentrations of pesticides, phthalates, PAHs, lead, and zinc in the groundwater beneath the site.

3

3. SCOPE OF WORK

3.1 INTRODUCTION

Field work for the Phase II investigation at the site began in October 1989 and was completed in February 1990. A site-specific health and safety plan (HSP) was submitted to NYSDEC for review and a quality assurance project plan (QAPP) was submitted for approval prior to the start of field work. The Phase II work plan was written by NYSDEC. The original plan included the installation of four groundwater monitoring wells and securing six groundwater samples from a combination of new and existing site wells, six surface and two subsurface soil samples, and one test pit sample. Based on the findings of the geophysical surveys, the proposed well locations remained unchanged. Two additional test pits were requested by NYSDEC and samples were collected from each test pit in order to determine if the alleged buried concrete reactor cells were present.

3.2 PHASE II SITE INVESTIGATION

3.2.1 Records Search/Data Compilation

Available information from state, county, municipal, and private files was collected and reviewed prior to the initiation of field work. Records from local and state agency files were reviewed to supplement the Phase I report prepared by ES and D&M in January 1986. The data review allowed for the proper completion of the field investigation and site assessment and calculation of the final HRS score. Specific contacts are listed in Table 3-1.

3.2.2 Site Reconnaissance and Site Safety

On May 9, 1989, E & E personnel conducted a site reconnaissance. The purposes of the site visit included:

- o Identify access problems;
- o Identify tentative locations for borings, wells, and surficial soil samples;
- o Determine if underground or aboveground utilities may impact drilling by visually inspecting boring locations and contacting utility companies;
- o Identify water supply for drilling purposes;
- o Conduct a limited air monitoring study using an HNu photoionization detector and mercury vapor analyzer; and
- o Photo-document present site conditions.

The air monitoring survey indicated no organic vapor readings above background and no mercury vapors in any areas tested. Two existing monitoring wells were noted in the northeast corner of the site (GW-3151 and GW-3251). The locking cap of GW-3251 was broken and the well was easily accessible. The site consisted of a church building and a small garage, and the surrounding grounds were flat-lying and open, covered by grass, concrete, and blacktop. The church building was closed and the entrances and windows were covered with wooden boards. The garage is used by LCARA for storage. All field observations were included in the site logbooks (see Appendix I).

At the beginning of each day of field activities, a site safety meeting was conducted by the site safety officer or the team leader. Discussions included the possible contaminants that may be on site, routes of exposure, the route to the hospital, location of the nearest phone, and the use of the air monitoring instruments. Also, an outline of the site activities for the day was discussed. Each person on site was requested to sign the attendance sheet at these meetings. A site-specific safety plan was available to all personnel at all times (see Appendix A).

3.2.3 Geophysical Survey

A geophysical survey consisting of shallow seismic refraction and GPR was performed at the site on October 24 and 25, 1989. These surveys were conducted across the entire site (see Figure 3-1). The results were used to determine site geological conditions (i.e., subsurface stratigraphy, depth to bedrock), locate buried materials (i.e., utilities, concrete reactor cells), and verify proposed monitoring well locations. The geophysical survey methods and results are presented in Appendix B.

3.2.4 Monitoring Well Installation

Three shallow overburden wells and one deep bedrock monitoring well were installed on the site between November 29 and December 7, 1989, by Buffalo Drilling Company, Inc. under the supervision of E & E. The wells were installed up- and downgradient of the site (see Figure 3-1 and Table 3-2). The upgradient well, GW-3155, and the downgradient wells GW-3157 and GW-3159 monitor shallow water while the probable downgradient well, GW-3257, monitors groundwater in the bedrock. The existing well, GW-3151, monitors upgradient shallow water and GW-3251 monitors probable upgradient groundwater in bedrock.

The new wells were drilled and constructed in accordance with NYSDEC guidelines. Soil samples were collected continuously using a split-spoon sampler during construction of each of the new wells. From each of the three boreholes (GW-3155, GW-3257, and GW-3159) two subsurface soil samples were collected. One was analyzed for grain-size characteristics and the other for Atterberg limits and moisture content. Soil samples were not taken from boring GW-3157 because it was adjacent to GW-3257.

The boreholes for shallow borings were advanced using 4.25-inch inside diameter (ID) hollow-stem augers until the base of the desiccated clay unit was encountered at a depth of approximately 12 feet below ground surface (GW-3155, GW-3157, and GW-3159). The desiccated clay zone was sealed off in boring GW-3257 with an 8-inch ID steel casing grouted in place. Drilling then continued using 3-1/4-inch ID hollow stem augers until auger refusal at 25 feet. Drilling through bedrock was performed using an HQ 3.98-inch outside diameter core bit to a depth of 40 feet below ground surface.

All of the new wells were completed using 2-inch ID schedule 40 flush-threaded polyvinyl chloride (PVC) riser with 5 feet of 0.010-inch machine slotted PVC screen in the shallow wells and 10 feet of screen in the bedrock well. A number 2 silica sand pack was placed around and 2 feet above each screen. The sand pack was followed by 1 to 2 feet of tamped bentonite pellets, then a 3-5% bentonite/cement grout mixture to the surface. The wells were then finished with a locking protective steel casing set into a concrete pad which extended an additional 2 feet above ground surface. The pad was sloped away from the well in all directions to prevent surface water from entering the well bore.

After completion of the wells, but not sooner than 24 hours after grouting was completed, each well was developed by bailing. Well development was performed until pH, conductivity, and temperature remained constant and water turbidity stabilized at less than 50 nephelometric turbidity units (NTUs).

The drill crew used the decontamination pad located adjacent to the water treatment plant in the fenced area of Love Canal to the south of the site as the location at which to steam clean the drill rig, augers, bits, rods, split spoons, and casings before and after the installation of each well. Split spoons were decontaminated at each drill site between each sample using a trisodium phosphate solution, tap water rinse, pesticide-grade methanol rinse, and triple deionized water rinse to prevent cross-contamination from one sample to the next.

Boring logs are found in Appendix C, the geotechnical soils analyses are included in Appendix D, and all site activities were recorded in the site logbooks and are included in Appendix I.

3.2.5 Subsurface Soil Sampling and Analysis

Three subsurface soil samples were collected for chemical analysis from three of the four boreholes (GW-3155, GW-3257, and GW-3159) during the installation of the four new monitoring wells. A sample from GW-3157 was not collected because it was adjacent to GW-3257. The samples were collected from the 2- to 4-foot depth range because this area exhibited the highest migration potential due to the presence of desiccation cracks in the clay. Although organic vapor analyzer (OVA) readings and mercury vapor analyzer readings were at background throughout the drilling process, samples were still collected because of the very low temperatures which may have suppressed volatilization.

In addition to the borehole samples, two subsurface soil samples (SS-7 and SS-8) were collected on December 4, 1989, beneath the blacktop parking lot at a depth of 2 feet below the surface (see Figure 3-2 and Table 3-3). The samples were analyzed for TCL organics and inorganics by E & E's Analytical Services Center (ASC). In addition, quality assurance/quality control (QA/QC) samples consisting of two matrix spike/matrix spike duplicate (MS/MSD) samples (SS-5MS/SS-5MSD and SS-8/MS/SS-8MSD) were analyzed for the compounds mentioned above. Analyses and reporting were performed following the NYSDEC Contract Laboratory Protocol (CLP).

Six subsurface soil samples were collected from three of the four new well borings (GW-3155, GW-3257, and GW-3159). Two samples were collected from each well, one analyzed for grain size, and the other analyzed for grain size, Atterberg limits, and moisture content.

Field procedures for subsurface soil sampling are presented in Appendix E. Geotechnical and analytical results are discussed in Sections 4.3 and 4.5, respectively, and raw data summary sheets are included in Appendix F. Photodocumentation records of the site reconnaissance, drilling, and sample collection are presented in Appendix G. Actual sample locations are found on the site survey map in Appendix H. Copies of field logbooks are included in Appendix I.

3.2.6 Groundwater Sampling and Analysis

Groundwater samples were collected from each of the four newly-installed monitoring wells and two existing wells on January 8 and 10, 1990 (see Figures 3-2 and Table 3-1). These samples were analyzed for TCL organics and inorganics by E & E's ASC. In addition, QA/QC samples consisting of one MS/MSD sample (GW-3257MS/GW-3257MSD) and one drill water sample (GW-3257-DW) were also analyzed for these parameters.

Field procedures for groundwater sampling are presented in Appendix E. Analytical results are discussed in Section 4.5 and raw data summary sheets are included in Appendix F. Actual well locations are shown on the site survey map in Appendix H. Copies of field logbooks are included in Appendix I.

3.2.7 Surface Soil Sampling and Analysis

Six surface soil samples (0-6 inches) were collected from various locations surrounding the church building on November 29, 1989 (see Figure 3-2 and Table 3-3). These samples were analyzed for TCL organics and inorganics by E & E's ASC. In addition, QA/QC samples consisting of two MS/MSD samples (SS-5MS/SS-5MSD and SS-8MS/SS-8MSD) were analyzed for these parameters. Field procedures for surface soil sampling are presented in Appendix E. Analytical results are discussed in Section 4.5 and raw data summary sheets are included in Appendix F. Actual sample locations are shown on the site survey map in Appendix H. Copies of field logbooks are included in Appendix I.

3.2.8 Test Pit Sampling and Analysis

Three test pits were excavated in the blacktop parking lot area on December 18, 1989, by Green Environmental Specialists, Inc. under the supervision of E & E (see Figures 3-1 and 3-2 and Table 3-4). The excavated soils were screened with an OVA. In Test Pit No. 1, one part per million (ppm) of total organic vapors above background was noted at a depth of 3 feet below ground surface; in Test Pit No. 2 at 3 ppm at 4 feet; and at 1 ppm at 2 feet in Test Pit No. 3. No readings were recorded in the breathing zone. Table 3-5 provides a detailed description of each test pit.

A 4-inch clay pipe trending north-south was ruptured during the excavation of Test Pit No. 1, causing water to flow into the test pit. The pipe is believed to be part of the roof drainage system of the church building carrying runoff to the local storm sewer system due to the close proximity of a manhole in line with the pipe in the parking lot. Soil was backfilled over the pipe to stop the water flow. The pipe was repaired on August 1, 1990 by Green Environmental Specialists, Inc., under the supervision of E & E prior to repaving the test pits. All three test pits were repaved with blacktop cold-patch on the above mentioned date. Soil samples TP-1 and TP-2 were analyzed by E & E's ASC for TCL organics and inorganics. The concrete fragment sample TP-3 was only tested for mercury. In addition, a QA/QC sample consisting of one MS/MSD sample (TP-2MS/TP-2MSD) was analyzed for these parameters.

The field procedures are described in Appendix E, results are discussed in Section 4.5, and raw data are presented in Appendix F. Actual test pit locations are found on the site survey map in Appendix H. Copies of field logbooks are included in Appendix I.

Table 3-1

SOURCES CONTACTED FOR THE NYSDEC PHASE II INVESTIGATION AT THE 97th STREET METHODIST CHURCH SITE

New York State Department of Health
Regional Toxic Program Office
584 Delaware Avenue
Buffalo, New York 14202
Contact: Cameron O'Conner
Telephone Number: 716/847-4365
Date: March 24, 1989
Information Gathered: File search for NYSDEC Phase II report preparation.

New York State Department of Environmental Conservation
584 Delaware Avenue
Buffalo, New York 14202
Contact: Jaspal Singh Walia
Telephone Number: 716/847-4585
Date: March 27-28, 1989
Information Gathered: File search for NYSDEC Phase II report preparation.

New York State Department of Environmental Conservation
Bureau of Hazardous Site Control
50 Wolf Road
Albany, New York 12233
Contact: Mike Ryan and Jane Thapa
Telephone Number: 518/457-9538
Date: April 3-4, 1989
Information Gathered: File search for additional data and NYSDEC Phase I reports.

New York State Department of Health
Bureau of Environmental Exposure
11 University Plaza
Room 205
Albany, New York 12203
Contact: Lani D. Rafferty
Telephone Number: 518/458-6306
Date: April 3-4, 1989
Information Gathered: Viewed site inspection reports for NYSDEC Phase II investigation.

New York State Department of Environmental Conservation
Division of Regulatory Affairs
600 Delaware Avenue
Buffalo, New York 14202
Contact: Mary Ketter
Telephone Number: 716/847-4551
Date: April 6, 1989
Information Gathered: File search.

Niagara County Department of Health
Division of Environmental Health
10th and E. Falls Street
Niagara Falls, New York 14302
Contact: Mike Hopkins
Telephone Number: 716/284-3129
Date: April 10, 1989
Information Gathered: File search for 97th Street Church site.

02[UZ]YO7080/D2834/2764/23

Table 3-1 (Cont.)

Soil and Water Conservation District
4487 Lake Avenue
Lockport, New York 14094
Contact: Dick Tilman
Telephone Number: 716/434-4949
Date: April 10, 1989
Information Gathered: Review of aerial photographs in the vicinity of the 97th Street Church site.

New York State Department of Environmental Conservation
Information Services/Significant Habitat Unit
Wildlife Resources Center
Delmar, New York 12054-9767
Contact: John Ozard
Telephone Number: 518/439-8391
Date: May 2, 1989
Information Gathered: Information on designated critical habitats with respect to NYSDEC Phase II sites.

New York State Department of Environmental Conservation
Fish and Wildlife Division
128 South Street
Olean, New York 14760
Contact: Joe Evans
Telephone Number: 716/372-8676
Date: January 24, 1990
Information Gathered: Stream classification and fisheries information.

New York State Department of Environmental Conservation
Water Division
600 Delaware Avenue
Buffalo, New York 14202
Contact: Rebecca Anderson
Telephone Number: 716/847-4590
Date: January 24, 1990
Information Gathered: Flood insurance rate maps.

02[UZ]YO7080/D2834/2764/23

Table 3-2

MONITORING WELL LOCATIONS

Well	Location
GW-3151 (existing)	Upgradient shallow overburden well near the northeast corner of the site.
GW-3251 (existing)	Upgradient bedrock well adjacent to GW-3151 near the northeast corner of the site.
GW-3155	Upgradient shallow overburden well near the northwest corner of the site.
GW-3157	Downgradient shallow overburden well 10 feet west of GW-3257 near the southwest corner of the site.
GW-3257	Downgradient bedrock well 10 feet east of GW-3157 near the southwest corner of the site.
GW-3159	Downgradient shallow overburden well near the southeast corner of the site.

[UZ]YO7080:D2834, #3025, PM = 32

Table 3-3

SURFACE AND SUBSURFACE SOIL SAMPLING LOCATIONS

Sample	Location
SS-1	19.3 feet north of the northwest corner of the garage
SS-2	17 feet west of the northwest corner of the the garage
SS-3	54.1 feet southwest of SS-2, north of the church building
SS-4	60 feet southwest of SS-3, west of the northwest corner of the church building
SS-5	15 feet south of the east corner of the church building entrance on Colvin Blvd.
SS-6	20 feet east of the northeast corner of the church building
SS-7 (subsurface)	Approximately 45 feet north of the church building near the southwest section of the blacktop parking lot at a depth of 2 feet
SS-8 (subsurface)	115.6 feet east of the southeast corner of the garage and 93.6 feet north of the northeast corner of the church building at a depth of 2 feet
GW-3155 (subsurface)	Near the northwest corner of the site at a depth interval between 2 to 4 feet
GW-3257 (subsurface)	Near the southwest corner of the site at a depth interval between 2 to 4 feet
GW-3159 (subsurface)	Near the southeast corner of the site at a depth interval between 2 to 4 feet

[UZ]YO7080:D2834, #2763, PM = 35

Table 3-4

TEST PIT SAMPLE LOCATIONS

Sample	Location
TP-1	Sample collected from gravel/clay interface at a depth of 1.4 feet below ground surface (i.e., blacktop) from Test Pit No. 1 located along GPR line 0+80, between lines C and D.
TP-2	Sample collected from the red-brown clay of the bottom of Test Pit No. 2 located along GPR line 0+20 between lines F and G.
TP-3	Sample consisted of a concrete fragment excavated from Test Pit No. 3 located along GPR line F between lines 0+70 to 0+90.

[UZ]YO7080:D2834, #2762, PM = 34

Table 3-5

TEST PIT DESCRIPTIONS

Depth	Description
Test Pit No. 1	
0 - 1.4 feet	Blacktop followed by fill (broken rock and gravel)
1.4 - 2.9 feet	Dark gray-green silty clay
2.9 - 4.0 feet	Red-brown clay
Test Pit No. 2	
0 - 1.4 feet	Blacktop followed by gravel and red bricks
1.4 - 3.4 feet	Medium gray, orange mottled silt and clay with occasional roots
3.4 - 4.0 feet	Red-brown clay
Test Pit No. 3	
0 - 2.0 feet	Blacktop followed by fill material (large rock fragments, gravel, and red bricks). Other debris noted were angle steel, steel reinforcement bars, plastic, a rubber boot, and a concrete fragment
2.0 - 3.3 feet	Medium gray silt and clay
3.3 - 4.0 feet	Red-brown clay

[UZ]YO7080:D2834, #2765, PM = 25

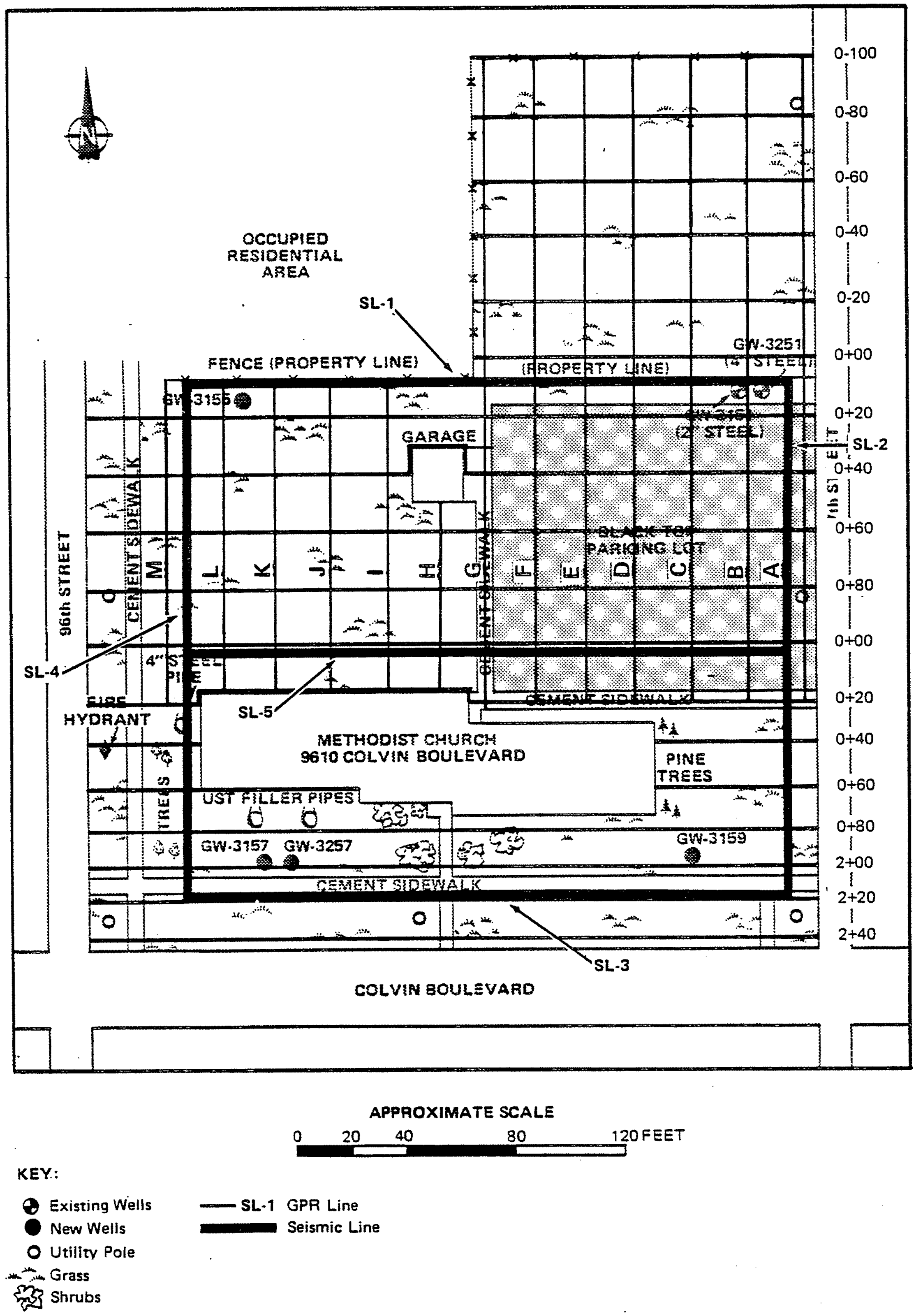


Figure 3–1
GEOPHYSICAL SURVEY AND PROPOSED GROUNDWATER MONITORING WELL LOCATIONS

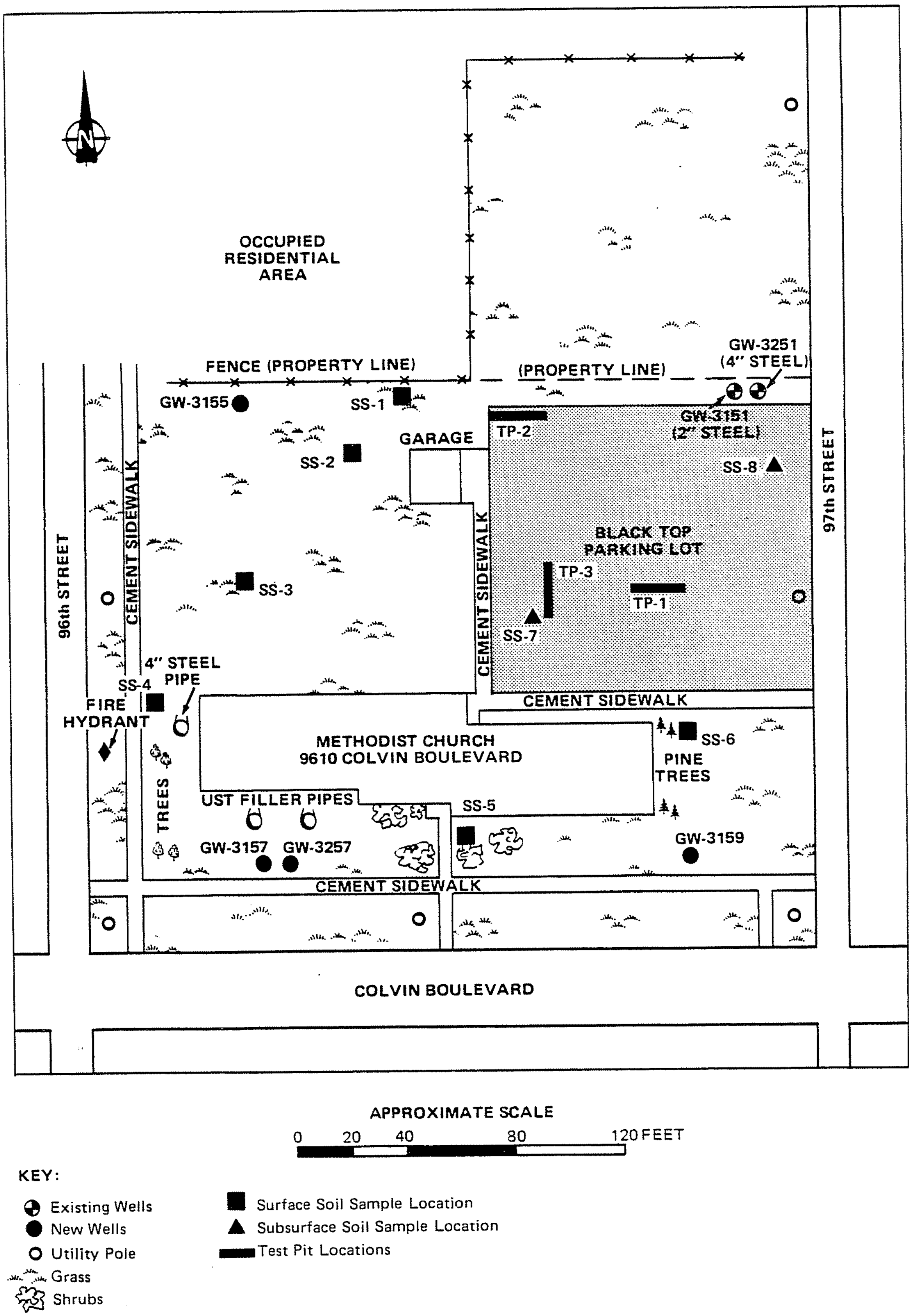


Figure 3–2
MONITORING WELL AND SURFACE AND SUBSURFACE SOIL SAMPLING LOCATIONS

4

4. SITE ASSESSMENT

4.1 SITE HISTORY

The 97th Street Church site is currently owned by the Love Canal Area Revitalization Agency. It was purchased on February 28, 1989, from the Western New York Conference (Wesley United Methodist Church), who had occupied the site since 1961. Prior to 1961, the site was owned by Mary Anne Nye Johnston and Mabel George (NYSDEC 1989).

On August 12 and September 9, 1958, Olin Chemical allegedly disposed of 23 tons of broken concrete reactor cells at the site to fill in low-lying areas. The materials were reportedly used in the manufacture of chlorine and were, therefore, potentially contaminated with mercury (NYSDEC 1986). Whether actual disposal of these materials at the site took place is questionable. According to Olin Chemical, the concrete cells were disposed in 1958 at a Methodist church located at 448 99th Street, Niagara Falls, New York. At the time of disposal, the only organic compound that Olin Chemical reports being manufactured was sodium methylate. Chlorinated organic production had ended in 1956 (NYSDEC 1986). The 97th Street Methodist Church was not erected until 1961; therefore, it did not exist at the time of disposal. Niagara Falls city directories for the years 1946-1965 indicated that the 99th Street Methodist Church was located at 398 99th Street in 1946 and 448 99th Street between 1946 and 1961 (Cummings 1985). No other incidents of waste disposal at this site have been reported.

In 1980, two monitoring wells, GW-3151 (overburden) and GW-3251 (bedrock), were installed by EPA in the northeast corner of the site as part of the Love Canal Investigation and Remedial Action Program. Low concentrations of pesticides were detected in these wells. In August 1982, USGS drilled four test borings, one in each corner of the site.

Soil samples were taken from each borehole and a groundwater sample was taken from only one of the boreholes.

Three organic compounds were detected in the groundwater: diethylphthalate, butylbenzylphthalate, and bis(2-ethylhexyl) phthalate. These compounds are common laboratory contaminants; therefore, it is unclear as to the actual source of the contamination. Iron was the only inorganic compound detected at high levels in the soil samples. In 1984, NYSDEC sampled the EPA wells and found elevated levels of pesticides, PAHs, and zinc.

A Phase I investigation was performed by ES and D&M beginning in April 1985 and was completed in January 1986. As part of an extended Phase I program, the EPA wells were sampled in May and September 1988. Elevated levels of lead were detected. The Phase II investigation began in October 1989 by E & E.

The site currently remains inactive, however, it is maintained by the LCARA and is easily accessible to the public.

4.2 REGIONAL SETTING

4.2.1 Regional Geology and Hydrology of Niagara County

Niagara County lies within the Central Lowland Physiographic Province, specifically, it occupies part of the Huron and Ontario Plains (Higgins et al. 1972).

This area, known as the Niagara Frontier, is relatively flat and broken by two east-west trending escarpments: the Niagara Escarpment and the Onondaga Escarpment. The site lies on the flat area between these escarpments called the Tonawanda Plain. This was the site of the postglacial Lake Tonawanda (Tesmer 1981).

Sediments in this area consist mainly of lacustrine deposits and glacial tills. The lacustrine deposits (i.e., silts and clays which settled to the bottom of the postglacial lake) are generally olive and brownish sediments overlying a red clay. The red clay was deposited by glacial Lake Lundy which covered almost the entire county. Glacial till also occupies a large part of the surface area in the county and underlies most areas of lake sediments. The glacial till deposits consist of ground moraines, drumlins, elongated till ridges, and terminal moraines. Ground moraines occupy the low undulating till plain and are approximately 10 to 15 feet thick. Drumlins are smoothly rounded hills that were molded beneath the ice. Drumlins in Niagara County are very subdued due to modification by the glacial lakes. Elongated till ridges are thin ridges of pebbly till trending northeast-southwest. These ridges may have been formed by giant flutings (furrows or grooves cut by glaciers) in the underlying Queenston shale. The terminal moraines have a general east-west trend and were formed when the ice stagnated for a long period of time. Other deposits, consisting of glacial outwash and beach deposits, exist in large belts (up to 8 miles in length) and are generally 1 to 10 feet thick.

Surface drainage of the Ontario Plan is northward into Lake Ontario and soil drainage is relatively poor. Surface drainage of the Huron Plain is southward into Tonawanda Creek and is also not well developed (Higgins et al. 1972).

The lacustrine sediments and glacial till of the Niagara Frontier are underlain by sedimentary rocks varying in thickness between 1,980 to 4,200 feet (see Figure 4-1) and are Ordovician, Silurian, and Devonian in age. The lower part of the Ordovician System is composed primarily of limestones and dolostones. The upper part is composed of massive shales, interbedded with thin sandstone layers. These are in turn overlain by the red shales of the Queenston Formations.

The Silurian system is composed of the Medina, Clinton, Lockport, and Salina Groups. The Medina Group consists of sandstones, shales, and siltstones. These are overlain by the limestones, shales, and dolostones of the Clinton, which in turn are overlain by the dolostones of the Lockport Group. Above the Lockport are shales, siltstones, and dolostones, and gypsum, anhydrite, and salt beds of the Salina Group. The poorly drained Tonawanda Plain is formed on the weathered surface of the Lockport and Salina Groups (Tesmer 1981).

The Devonian system overlies Silurian rocks to the south of Niagara County. The formation at the Devonian-Silurian contact is the Onondaga limestone which is a massive cherty limestone that outcrops across most of northern Erie County.

Niagara County has abundant surface waters bordering it: Tonawanda Creek to the south, the Niagara River to the west, and Lake Ontario to the north. The county's municipal water district draws most of its water from the Niagara River. However, rural residents depend on both bedrock and overburden wells. The bedrock wells north of the Niagara Escarpment are dug or drilled into the Queenston shale. The yields of water are often inadequate during extended dry periods and may contain high levels of salt or sulfate. Bedrock wells to the south of the escarpment are drilled into the Lockport dolomite. Yields are generally higher, but the water is hard from high calcium and other base concentrations. Shallow dug wells and springs are commonly in the three most permeable of the 11 soil associations in Niagara County: the Otisville-Altmar-Fredon-Stafford association, the Howard-Arkport-Phelps association, and the Hilton-Ovid-Ontario association. The shallow wells are less desirable than bedrock wells due to increasing pollution of shallow groundwater, primarily by septage (Higgins et al. 1972).

4.3 SITE GEOGRAPHY

4.3.1 Topography

The site is located on the Huron Plain of the Central Lowland Physiographic Province. The plain is nearly level and slopes gently westward from an altitude of approximately 600 feet above mean sea level (AMSL) on the east to 570 AMSL feet along the Niagara River. The low-lying plain is broken in places by low, narrow, irregular ridges trending northeast-southwest. They extend up to 2 miles in length and are 20 to 50 feet above the general land surface (Higgins et al. 1972).

The ground surface over the site is flat with a <1% slope and is at an elevation of approximately 575 feet AMSL (USGS 1980).

The site is located in Zone C of the Flood Insurance Rate Map dated March 16, 1983 (Community Panel No. 360506003B) prepared by the Federal Emergency Management Agency (FEMA). Zone C represents areas of minimal flooding. The map is currently undergoing revisions and, based upon the preliminary revised map (Community Panel No. 360506003C), the site is now located in Zone A5 which is an area of 100-year flood plain with base elevations and flood hazard factors determined. The revised map is expected to be published in September 1990 (Anderson 1980).

4.3.2 Soils

Eleven different soil associations have been designated for Niagara County. The site lies within the Canandaigua-Raynham-Rhinebeck association. The soil is found in areas dominated by soils formed in lake-laid silts and very fine sands. The soils are nearly level to gently sloping, are poorly to very poorly drained, and have a medium to fine textured subsoil. This association, which makes up approximately 11 percent of the county, is composed of 26 percent Canandaigua soils, 23 percent Raynham soils, 17 percent Rhinebeck soils, and 34 percent minor soils. The minor soils are mainly of the Lakemont, Madalin, Odessa, Niagara, Minoa, and Lamson series. These soils are also poorly to very poorly drained (Higgins et al. 1972). The permeability of the soils in this association range from 0.63 to 2.0 inches per hour and the pH ranges from 5.6 to 7.6.

The new soil borings at the site (see Appendix C) generally indicated approximately 2 feet of a sandy, clayey silt at or close to the surface, followed by 2 to 4 feet of silt and clay (exhibiting evidence of desiccation cracks), 10 feet of clay, 1 foot of silt and clay, and 8 feet of silty, clayey sand. The overburden shows varves and thickens 5 to 10 feet from south to north across the site, as indicated by the seismic survey. Varves are sedimentary beds or laminations that are deposited each year within glacial lakes. Results of the geotechnical analyses of the site soils (Appendix D) are summarized in Table 4-1.

4.4 SITE HYDROGEOLOGY

The information used to develop the discussion in this subsection includes the Phase II geophysical survey, four monitoring well borings and installations, USGS topographic maps, geological survey maps, and regional groundwater reports.

The geophysical survey results are presented in Appendix B, the boring logs are included in Appendix C, and geotechnical analysis results are presented in Appendix D.

4.4.1 Geology

Bedrock underlying the soils at the site is at a depth of 25 feet in the southwest corner of the site as determined by the drilling of GW-3257 and 30.5 feet in the northeast corner as determined by the drill log from GW-3152 (see Appendix C). The top of the bedrock was also estimated to be 5 to 10 feet deeper in the northern part of the site, as indicated by the shallow seismic refraction survey (see Appendix B). The top 5 feet of bedrock is a weathered, medium to light gray dolostone. The entire core from a depth of 25 feet to 40 feet below ground surface is heavily fractured, with some mineralization along fracture planes, and contains styolites and small vugs filled with gypsum. The fractures are mostly horizontal; however, two high angle fractures (45° and 75°) were noted between a depth of 25 to 30 feet below ground surface. The fractures are partially filled with clay. Drill log information is summarized in Table 4-2.

The bedrock underlying the site is part of the Lockport Group. In this region, the Lockport is almost all dolostone. The formations are generally brownish-gray in color, medium to thick bedded, stylolitic, exhibiting parting (i.e., separations along planes), mineralized vugs, and poorly preserved fossils. The group is divided into four formations: Oak Orchard Dolostone, Eramosa Dolostone, Goat Island Dolostone, and Gasport Limestone from youngest to oldest, respectively. The Oak Orchard Dolostone is approximately 120 feet thick and forms the cap rock to the American Falls, the Eramosa Dolostone is approximately 15 feet thick, the Goat Island Dolostone is approximately 17 to 26 feet thick, and the Gasport Limestone is approximately 15 to 45 feet thick. The Eramosa and Goat Island Dolostones are mined for crushed stone and asphalt filler, and the Gasport Limestone has been used as building stone (Tesmer 1981).

4.4.2 Hydrology

Groundwater

Four new groundwater monitoring wells were installed at the site. These wells were installed to establish if groundwater contamination from the alleged burial of mercury-contaminated concrete reactor cells occurred. The well locations are shown in Figure 3-2 and well construction data are presented in Table 4-3. Appendix C contains the boring logs for three of the four new wells, as well as the logs for the two existing wells (GW-3151 and GW-3251) drilled in 1980. A boring log for GW-3157 was not recorded because it is adjacent to GW-3257. Water level data are shown in Table 4-4.

The new wells were placed in three of the four corners of the site. The southwest corner received both a shallow overburden and a bedrock well, and the northwest and southeast corners received shallow overburden wells. The northeast corner of the site already contained an overburden and bedrock well installed by EPA in 1980. Under directions from NYSDEC, the three new shallow overburden wells were screened with a 5-foot screen in the fractured (desiccated) clay zone. All three wells monitor the water table. Water was at a depth of approximately 3 to 7 feet below ground surface. The bedrock well was screened in competent bedrock and monitors groundwater at a depth of approximately 10 feet below ground surface. Depth to groundwater varied 2.26 feet between GW-3157 (overburden) and GW-3257 (bedrock), and 5.46 feet between GW-3151 (overburden) and GW-3251 (bedrock). This may be due to semi-confined or confined conditions caused by the overlying silts and clays, thus creating a potentiometric surface.

Groundwater flow on the water table zone appears to be to the southwest, as indicated by water level contours presented in Figure 4-2. Groundwater flow in the bedrock cannot accurately be determined due to an insufficient number of on-site bedrock wells; however, the water table appears relatively flat based upon information from the two on-site bedrock wells. The shallow groundwater flow may be influenced by the groundwater pumping and treatment station in the fenced area of Love Canal, immediately south of the site on the south side of Colvin Boulevard.

Surface Water

Bergholtz Creek is 0.17 mile north of the site and flows west to Cayuga Creek. Cayuga Creek is 0.59 mile to the west of the site and flows south to the Niagara River. The Niagara River is 0.66 mile to the south of the site and flows to the west (USGS 1980).

Bergholtz Creek is a Class D stream from its source to its mouth at the junction with Cayuga Creek. Cayuga Creek is a Class C stream from its mouth to Tributary No. 2, and Class D from Tributary No. 2 to its source. Tributary No. 2 is located approximately 0.2 mile north of Niagara Falls Boulevard. The Niagara River is Class A-between the confluence of Lake Erie and Lake Ontario from the international boundary to the American shore.

Class A- is the same as Class A waters (i.e., a source of water supply for drinking, culinary or food processing purposes, and any other uses); however, the Class A- designation is used when international waters are involved (Evans 1990 and McKeown 1990). Class C waters are suitable for fishing and all other uses, except as sources of drinking, culinary, or food processing waters, or for primary contact recreation. Class D waters are suitable for secondary contact recreation, but due to such natural conditions as intermittency of flow water quality or stream bed conditions, these waters are not conductive to propagation of game fishery and will not support the propagation of fish (NYSDEC 1986).

4.5 SITE CONTAMINATION ASSESSMENT

Analytical data for the site contamination assessment are presented in Appendix F. For TCL organic compounds, all positive reported values and qualifiers for samples, field QC samples, and laboratory MS/MSD samples are presented on data summary forms. For the inorganic portion of the TCL list, CLP Form 1s are included for all samples and field QC samples.

All CLP data packages were reviewed to determine whether qualified data were acceptable for the intended use. In general, common laboratory contaminants, including methylene chloride, acetone, 2-butanone, and phthalate compounds, are considered background contamination and not evaluated if the values are qualified with a "B" and levels are less than five times the detection limit. All QA/QC requirements were met and the data were acceptable.

4.5.1 Subsurface Soil From Well Borings

Subsurface soil samples were collected from GW-3155, GW-3257, and GW-3159 using decontaminated split spoons and analyzed for TCL organics and inorganics. A sample was not collected from GW-3157 because it was adjacent to GW-3257. None of the samples collected exhibited organic vapors or mercury vapor readings above background; however, the soil was sampled because ambient air temperatures may have been suppressing volatilization.

Two volatile organic compounds (trichloroethene and 1,1,2,2-tetrachloroethane) were detected in sample GW-3257, which was collected at a depth of 2-4 feet (see Table 4-5 and Appendix F). One volatile organic compound (tetrachloroethene) was also detected below quantitation sample limits from this sample. Only one metal (cobalt) was detected above the common concentration range for metals in natural soils of the eastern United States (see Table 4-6). This elevated concentration also occurred in sample GW-3257. No other chemical compounds (i.e., BNAs, PCBs/pesticides, or cyanide) were detected in the subsurface soil from the well borings.

4.5.2 Groundwater

Six groundwater samples were collected using dedicated PVC bailers from the four new monitoring wells and the two existing wells and analyzed for TCL organics and inorganics. Well GW-3251 is considered upgradient and GW-3257 is considered the downgradient well for the bedrock zone. Wells GW-3151 and GW-3155 are considered shallow upgradient wells and GW-3157 and GW-3159 are considered downgradient wells that monitor the shallow groundwater aquifer within the overburden. Groundwater elevation data support this latter assumption. It appears that the shallow water may be affected by a groundwater pumping and treatment station in the fenced area of Love Canal, immediately south of the site on the south side of Colvin Boulevard.

One volatile organic compound (total xylenes) was detected in sample GW-3257. Six BNAs (1,4-dichlorobenzene, n-nitroso-di-n-propylamine, 1,2,4-trichlorobenzene, 2,4-dinitrotoluene, and two PAHs (acenaphthene and pyrene) were detected in sample GW-3159 in very low concentrations (i.e., less than sample quantitation limits). These analytical results are presented in Table 4-7 and Appendix F.

Total iron and manganese exceeded NYSDEC Class GA groundwater standards in water samples from all of the new and existing wells, and total lead exceeded standards in the drill water sample (GW-3257-DW) and in well GW-3257. The best use for Class GA water is as a potable water supply (NYSDEC 1986). Dissolved iron exceeded standards only in wells GW-3151, GW-3157, and GW-3257. Dissolved manganese exceeded standards only in wells GW-3151, GW-3155, GW-3157, and GW-3159. Levels of dissolved manganese were higher than total manganese in samples GW-3155 and GW-3159. This was probably due to sample differentials because the total and dissolved portions were collected on different days. Dissolved lead was not analyzed for the drill water sample and was not detected in GW-3257. It is possible that the presence of total lead levels in well GW-3257 may be attributed to the introduction of the drill water. Table 4-8 presents the groundwater inorganic analysis results.

4.5.3 Soils

Eight near-surface soil samples were collected from the site and analyzed for TCL organics and inorganics. Six were from the surface (0 to 6 inches) and two were from a depth of 2 feet below the blacktop parking lot. The surface soils were collected with dedicated pre-cleaned stainless steel spoons and the subsurface soils were collected with a decontaminated split spoon sampler using the drill rig.

Several BNAs were detected in the near-surface soil samples in very low concentrations, except in sample SS-6 where elevated concentrations of PAHs were detected. Isophorone was detected in sample SS-1 and SS-4, dibenzofuran in SS-6, and 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene in SS-8. Also, numerous PAHs (phenanthrene, fluoranthene, pyrene, and benzo(b)fluoranthene) were detected in all of the near-surface soils except SS-5, along with acenaphthene in SS-6 and SS-7, anthracene and fluorene in SS-6, benzo(a)anthracene, chrysene, benzo(a)pyrene, indeno(1,2,3-CD) pyrene, and benzo(g,h,i) perylene in all samples except SS-4 and SS-5 (see Table 4-5 and Appendix F). Calcium in sample SS-8 was the only inorganic substance that exceeded the common range of natural soils in the eastern United States (see Table 4-6 and Appendix F). No other chemical constituents (i.e., volatile organics, PCBs/pesticides or cyanide) were detected in the near-surface soil samples.

4.5.4 Test Pit Samples

One test pit sample was collected from each of the three test pits dug in the blacktop parking lot area using dedicated pre-cleaned stainless steel spoons. Samples TP-1 and TP-2 were soil samples that were analyzed for TCL organics and inorganics, and sample TP-3 was a concrete fragment sample analyzed only for mercury.

Several BNAs were detected in very low concentrations (i.e., below sample quantitation limits) in the soil sample TP-1. Phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd) pyrene, and benzo(g,h,i) perylene were detected in TP-1MS, but only anthracene and fluoranthene were detected in TP-1MSD. Only fluoranthene and pyrene were detected in TP-1 (see Table 4-5 and Appendix G). The chemical constituents varied in the original sample and MS/MSD samples because of the difficulty of getting duplicate samples at such low concentrations. Chromium was the only inorganic substance detected above the common range for natural soils in the eastern United States (see Table 4-6 and Appendix F). Mercury was not detected in the concrete fragment TP-3. No other chemical constituents (i.e., volatile organics, PCBs/pesticides, or cyanide) were detected in samples from the test pits.

4.5.5 Contamination Assessment Summary

The groundwater beneath the site contained very low levels (below sample quantitation limits) of total xylenes in the shallow water table aquifer and 1,4-dichlorobenzene, n-nitroso-di-n-propylamine, 1,2,4-trichlorobenzene, 2,4-dinitrotoluene, and several PAHs in the bedrock aquifer. These chemical constituents were only detected in downgradient wells; therefore, the source may be on site. Iron and manganese were also detected in all the wells, and total lead was detected in GW-3257 and in the drillwater sample. Iron and manganese are common metals found in sediments and groundwater. The lead concentration in GW-3257 may have been elevated by the use of drill water which contained lead. The source of the drillwater was the city of Niagara Falls water taken at the groundwater pumping and treatment station directly south of the site.

The near-surface soils (0-2 feet) contained very low concentrations (below sample quantitation limits) of isophorone in SS-1 and SS-4, dibenzofuran in SS-6, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene in SS-8. PAHs were also detected in all near-surface soil samples except SS-5. Sample SS-5 was located in front of the entrance to the church building on Colvin Boulevard (see Figure

3-2). Most of the concentrations of PAHs were very low level, except in sample SS-6. The actual cause of these high concentrations are unknown; however, sample SS-6 is located on the east side of the church building in close proximity to the asphalt parking lot, where runoff from the parking lot may be influencing the PAH content in the sample. Calcium was the only inorganic substance that exceeded the common range of natural soils of the eastern United States.

The subsurface soil from well boring GW-3257 at a depth of 2-4 feet contained trichloroethene, tetrachloroethene, 1,1,2,2-tetrachloroethane, and cobalt above the common range for natural soils of the eastern United States. This sample was taken from a downgradient soil boring; therefore, the source of the contaminants is probably on site. The subsurface soil sample TP-1 at 1.4 feet from surface contained very low concentrations (i.e., below sample quantitation limits) of PAHs and chromium above natural soil concentrations for the eastern United States. No other contaminants were detected from TP-2 (sampled at a depth of 4 feet) or the TP-3 concrete fragment (sampled at a depth of 2 feet).

4.6 RECOMMENDATIONS

Based upon the geophysical surveys, test pit excavations, and groundwater and soil sample analyses, there is no evidence of the presence of concrete reactor cells or lead and mercury contamination at the 97th Street Methodist Church site. Since the groundwater in the area is not used nor is it likely to be used by the public and almost all surface soils contained very low concentrations of chemical contaminants. Except for sample SS-6 which contained elevated levels of PAHs, there appears to be no immediate threat to human health and the environment from the site. The levels of PAHs are low enough not to cause concern. No further action on this site is recommended.

Table 4-1

GEOTECHNICAL ANALYSES SUMMARY

Sample Identification	Test Type	Results
GW-3155-1 (2-4 feet)	Particle size	Silt and clay (22.3% water content)
GW-3155-2 (10-12 feet)	Particle size Atterberg limits	Lean clay (28.6% water content) Liquid limit - 45 Plastic limit - 22 Plasticity index - 23
GW-3257-1 (6-8 feet)	Particle size	Silt and clay (24.4% water content)
GW-3257-2 (24-26 feet)	Particle size Atterberg limits	Silty, clayey, gravel with sand (7.7% water content) Liquid limit - 17 Plastic limit - 12 Plasticity index - 5
GW-3159-1 (2-4 feet)	Particle size	Silt and clay with some fine sand (8.1% water content)
GW-3159-2 (10-12 feet)	Particle size Atterberg limits	Lean clay (27.7% water content) Liquid limit - 42 Plastic limit - 22 Plasticity index - 20

[UZ]YO7080:D2834, #3026, PM=22

Table 4-2

DRILLING LOG INFORMATION OF NEW AND EXISTING WELLS

Well Type	Approximate Thickness of Overburden (feet)	Approximate Elevation** of Top of Bedrock or Refusal (feet above MSL)	Approximate Thickness of Weathered Bedrock (feet)	Total Depth of Well Measured From Top of PVC Casing or Steel Casing Where Indicated (feet)	Comments
GW-3151 (existing) overburden	NA	NA	NA	24.84*	Drilled 9/24/80
GW-3251 (existing) bedrock	30.5	468.3	Unknown	32.5*	Drilled 9/24/80 - 9/27/80
GW-3155 (new) overburden	NA	NA	NA	14.95	Drilled 11/30/89
GW-3157 (new) overburden	NA	NA	NA	11.33	Drilled 11/31/89
GW-3257 (new) bedrock	25.0	474.1	5.0	39.17	Drilled 11/30/89 - 12/6/89
GW-3159 (new) overburden	NA	NA	NA	14.91	Drilled 12/1/89

[UZ]YO7080:D2834, #2761, PM=13

NA = Not applicable
MSL = Mean sea level

*Measured from top of steel casing.
**Elevations are not true elevations, but are referenced to a bonnet bolt (assumed elevation of 500 feet) on the fire hydrant located on the east side of 96th Street, west of the church building.

Table 4-3

MONITORING WELL CONSTRUCTION DATA

Well	Opening	Feet of Screen or Open Hole	Feet of Riser	Thickness of Bentonite (feet)	Total Depth of Well from Top of PVC Casing (feet)	Stick-up Height (feet)
GW-3151 (existing)	Screen	2	23	None	24.84	3
GW-3251 (existing)	Open	5	27.5	None	32.5	3
GW-3155 (new)	Screen	5	10	2	14.95	2
GW-3157 (new)	Screen	5	6	2	11.33	2
GW-3257 (new)	Screen	10	29	2	39.17	2
GW-3159 (new)	Screen	5	10	2	14.91	2

[UZ]YO7080:D2834, #2760, PM = 15

Table 4-4

WATER LEVEL DATA

Well	Date Measured	Depth Measured from Top of PVC Casing Unless Otherwise Indicated (feet)	Elevations Above MSL**		
			Elevation at Top of Casing	Grade Elevation	Water Level Elevation
GW-3151	1/8/90	6.63*	502.45*	499.3	495.82
GW-3251	1/8/90	12.04*	502.40*	498.8	490.36
GW-3155	1/8/90	5.25	501.67	498.8	496.32
GW-3157	1/8/90	8.89	501.53	499.3	492.64
GW-3257	1/8/90	11.40	501.78	499.1	490.38
GW-3159	1/8/90	6.95	502.34	499.4	495.39

[UZ]YO7080:D2834, #3027, PM = 26

MSL = Mean sea level

*From top of steel casing.
**Elevations are not true elevations, but are referenced to a bonnet bolt (assumed elevation of 500 feet) on the fire hydrant located on the east side of 96th Street, west of the church building.

Table 4-5

SOILS ORGANIC ANALYSES SUMMARY

Compound Detected	Concentration ($\mu g/kg$)	Sample
Volatile Organics		
Trichloroethene	19	GW-3257 (2-4 feet)
Tetrachloroethene	4 (J)	GW-3257 (2-4 feet)
1,1,2,2-Tetrachloroethene	14	GW-3257 (2-4 feet)
BNAs		
Isophorone	70 (J)	SS-1
	370 (J)	SS-4
1,4-Dichlorobenzene	170 (J)	SS-8
1,2-Dichlorobenzene	240 (J)	SS-8
1,2,4-Trichlorobenzene	310 (J)	SS-8
Dibenzofuran	59 (J)	SS-6
Total PAHs	1,900 (J)	SS-1
	1,600 (J)	SS-2
	1,800 (J)	SS-3
	1,200 (J)	SS-4
	20,000	SS-6
	2,300 (J)	SS-7
	1,400 (J)	SS-8
	3,100 (J)	SS-8 MS
	4,000 (J)	SS-8 MSD
	100 (J)	TP-1
	2,600 (J)	TP-1 MS
	140 (J)	TP-2 MSD

[UZ]YO7080:D2834, #3028, PM = 25

J = Estimated value for tentatively identified compounds or when mass spectral data indicate the presence of a compound that meets the identification criteria, but the result is less than the sample quantitation limit but greater than zero.

Table 4-6

SOIL AND CONCRETE FRAGMENT INORGANIC ANALYSES

Inorganics Detected	Range in Samples (mg/kg)	Guidelines for Soils/ Surface Materials of Eastern United States[1]: Range (mg/kg)	Guidelines for Soils/ Surface Materials of Eastern United States[1]: Estimated Arithmetic Mean (mg/kg)	Comments	Samples Exceeding Concentration Range: Location	Samples Exceeding Concentration Range: Level (mg/kg)
Aluminum	11,400 - 22,500	7,000 - >100,000	57,000	Levels are all below the arithmetic mean		
Arsenic	2.8 - 6.4	<1.1 - 73	7.4	Levels are all below the arithmetic mean		
Barium	68.5 - 171.0	10 - 1,500	420	Levels are all below the arithmetic mean		
Cadmium	ND - 5.0	No guideline				
Calcium	2,010 - 365,000	10 - 280,000	630	Levels are all above the arithmetic mean	SS-8	365,000
Chromium	17.3 - 1,190	1 - 1,000	52	Levels are all below the arithmetic mean except for sample TP-1 which exceeded the common range	TP-1	1,190
Cobalt	7.0 - 71.7	<0.1 - 70	9.2	Levels are often close to the arithmetic mean except for sample SS-7 (40.5 mg/kg) and GW-3257, which exceeded the common range	GW-3257 (2-4 feet)	71.7
Copper	13.4 - 26.3	<1 - 700	22	Levels are often close to the arithmetic mean		
Iron	19,100 - 37,200	10 - >100,000	2,500	Levels are all greater than the arithmetic mean		
Lead	4.7 - 41.4	<10 - 300	17	Levels are close to the arithmetic mean		
Magnesium	4,460 - 13,300	50 - 50,000	460	Levels are all above the arithmetic mean		
Manganese	208 - 2,880	<2 - 7,000	640	Levels are all below the arithmetic mean except for sample GW-3257 (2,880 mg/kg)		
Mercury	ND - 2.8	0.01 - 3.4	0.12	Levels are all above the arithmetic mean except for samples SS-5 (0.14 mg/kg), SS-7 (0.12 mg/kg), and SS-8 (0.13 mg/kg) which were close to the arithmetic mean.		

[UZ]YO7080:D2834, #2755, PM = 4

Table 4-6 (Cont.)

Inorganics Detected	Range in Samples (mg/kg)	Guidelines for Soils/Surface Materials of Eastern United States[1]: Range (mg/kg)	Estimated Arithmetic Mean (mg/kg)	Comments	Samples Exceeding Concentration Range: Location	Level (mg/kg)
Nickel	19 - 50.0	<5 - 700	18	Levels are all above the arithmetic mean		
Potassium	1,010 - 2,750	50 - 3,700	--	Levels are often in the medium range		
Sodium	122 - 340	<500 - 50,000	780	Levels are all below the arithmetic mean		
Vanadium	16.1 - 41.1	<7 - 300	66	Levels were all below the arithmetic mean		
Zinc	55.2 - 143	<5 - 2,900	52	Levels were all slightly above the arithmetic mean		

[UZ]YO7080:D2834, #2755, PM = 4

[1]Shacklette and Boerngen 1984.
ND = Not detected

Table 4-7

GROUNDWATER ORGANIC ANALYSES SUMMARY

Compound Detected	Concentration (µg/L)	Sample	Regulatory Limits (µg/L)
Volatile Organics			
Total xylenes	2.0 (J)	GW-3257	10,000[1]
	1.0 (J)	GW-3257 MS	
	2.0 (J)	GW-3257 MSD	
BNAs			
1,4-Dichlorobenzene	4.0 (J)	GW-3159	
n-Nitroso-di-n-propylamine	5.0 (J)	GW-3159	
1,2,4-Trichlorobenzene	4.0 (J)	GW-3159	
2,4-Dinitrotoluene	2.0 (J)	GW-3159	
Total PAHs	9.0 (J)	GW-3159	

[UZ]YO7080:D2834, #2758, PM = 21

[1]50 Federal Register 46902 1985 Proposed Maximum Contaminant Levels

J = Estimated value for tentatively identified compounds or when mass spectral data indicate the presence of a compound that meets the identification criteria, but the result is less than the sample quantitation limit but greater than zero.

Table 4-8

GROUNDWATER INORGANIC ANALYSES

Inorganics Detected	Range (μg/L)	NYSDEC Class GA Groundwater Standards[1] (μg/L)	Sample Exceeding Standards (μg/L)		
			Location	Total Metals	Dissolved Metals
Aluminum	ND-8330	No regulatory limit			
Arsenic	ND-5.9	25			
Barium	ND-95.1	1,000			
Cadmium	ND-6.8	10			
Calcium	85,400-954,000	No regulatory limit			
Chromium	ND-33.0	50			
Cobalt	ND-17.9	No regulatory limit			
Copper	ND-123	1,000			
Iron	68-84,700	300	GW-3151	84,700	7,420
			GW-3251	46,000	85
			GW-3155	10,800	151
			GW-3157	2,150	804
			GW-3257	116,000	1,370
			GW-3159	10,900	68

[UZ]YO7080:D2834, #2757, PM = 23

Table 4-8 (Cont.)

Inorganics Detected	Range (µg/L)	NYSDEC Class GA Groundwater Standards[1] (µg/L)	Sample Exceeding Standards (µg/L)		
			LOCATION	Total Metals	Dissolved Metals
Lead	ND-35.9	25	GW-3257	34.8	ND
			GW-3257-DW	35.9	NR
Magnesium	ND-246,000	No regulatory limit			
Manganese	ND-1,030	300	GW-3151	1,030	610
			GW-3251	357	ND
			GW-3155	367	683
			GW-3157	629	499
			GW-3257	436	40.8
			GW-3159	603	650
Potassium	94.4-9,090	No regulatory limit			
Sodium	38,500-124,000	No regulatory limit			
Vanadium	ND-32.7	No regulatory limit			
Zinc	ND-134	200			

[UZ]YO7080:D2834, #2757, PM = 23

[1] Source: NYSDEC 1986 Water Quality Regulations

ND = Not detected
NR = Not run
GA = Water best suited as a potable water supply

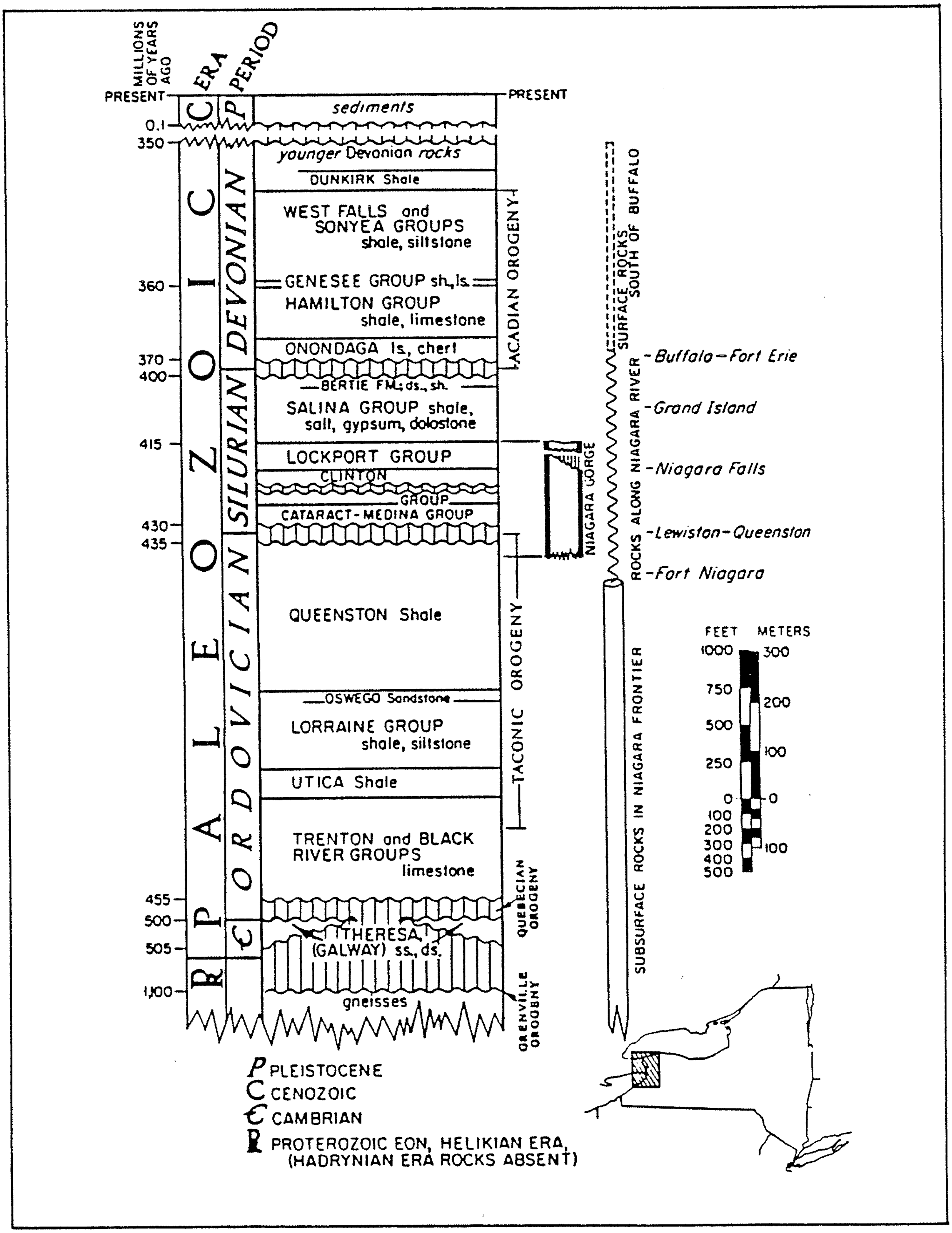


Figure 4—1
STRATIGRAPHIC COLUMN, NIAGARA FRONTIER

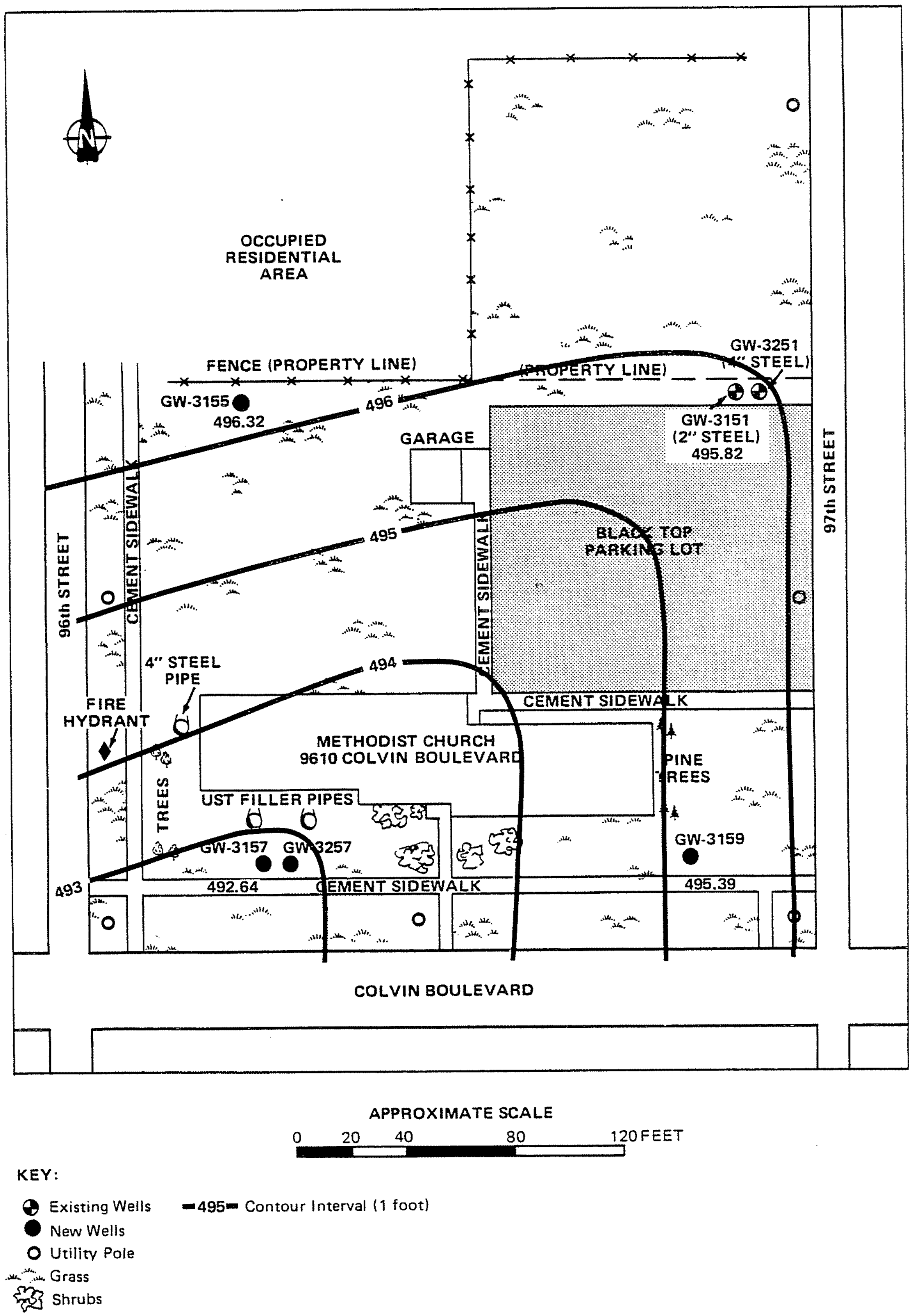


Figure 4–2
SHALLOW GROUNDWATER ELEVATION CONTOUR MAP

5

5. FINAL APPLICATION OF HAZARD RANKING SYSTEM

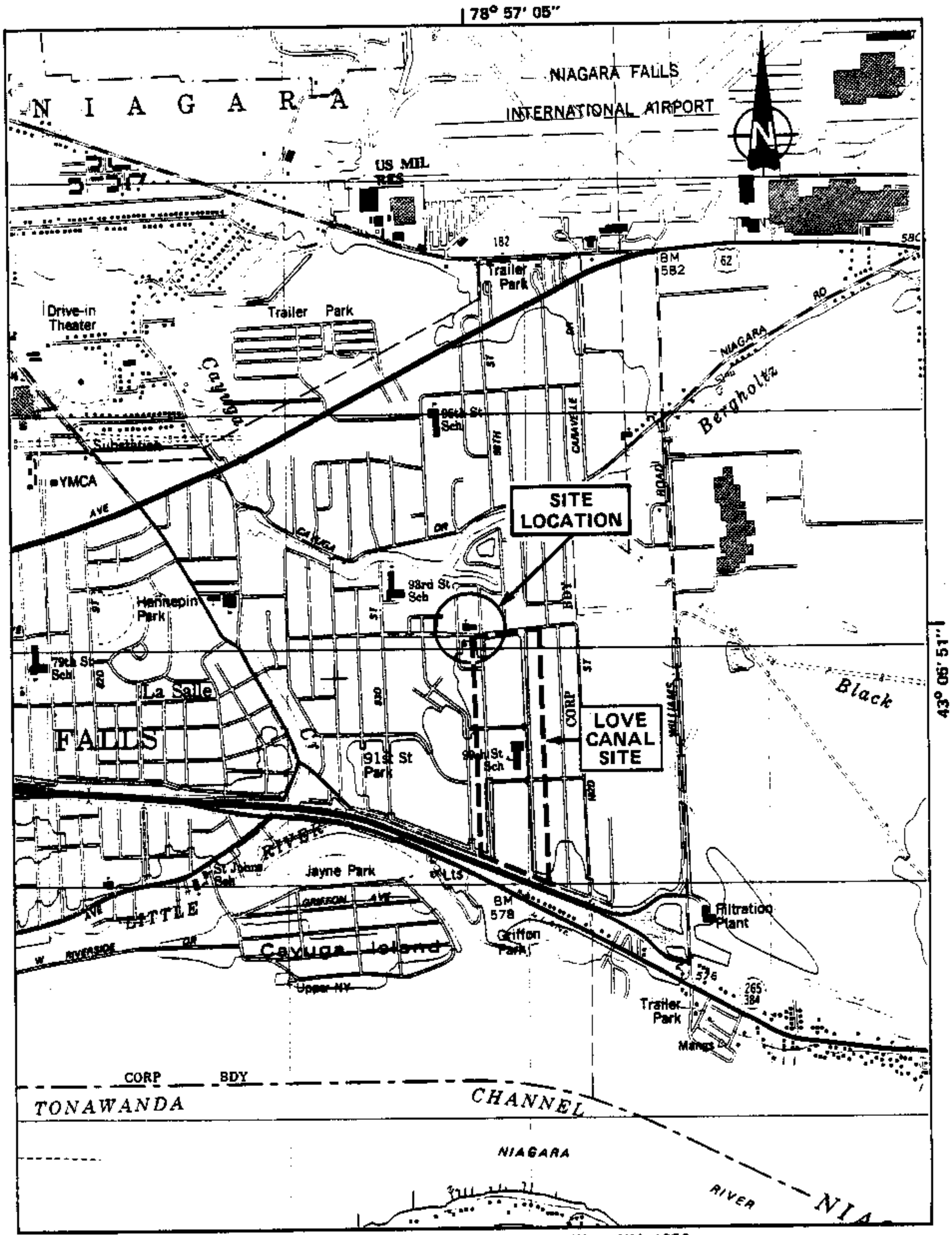
5.1 NARRATIVE SUMMARY

The 97th Street Methodist Church site is situated within a 1-acre parcel located in the city of Niagara Falls, Niagara County, New York (see Figure 5-1). The church was built in 1961. LCARA is the current owner. The facility was previously owned by Western New York Conference (Wesley United Methodist Church), and prior to that by Mary Ann Nye Johnston and Mabel George.

Approximately 23 tons of broken concrete reactor cells were allegedly disposed on site by Olin Chemical in 1958 as fill for low-lying areas, although Olin Chemical asserts that the disposal took place elsewhere.

According to tests conducted by E & E, only very low levels (below sample quantitation limits) of contaminants were found in the groundwater and soils. Mercury was not detected on site in any of the water samples and it was within common ranges for soils in the eastern United States from all the soil samples tested. No pesticides or cyanide were detected from any of the water and soil samples collected on site. Only one small concrete fragment was found in the test pits and mercury was not detected from this fragment.

The site is located at 9610 Colvin Boulevard between 96th and 97th Streets in the city of Niagara Falls. Approximately 11,871 people within a 1-mile radius are potentially affected by direct contact and possible groundwater contamination.



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle, Tonawanda West, NY, 1980.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 5–1
LOCATION MAP: 97th STREET METHODIST CHURCH SITE

FIGURE 1

H R S   C O V E R   S H E E T

Facility Name: 97th Street Methodist Church Site

Location: 9610 Colvin Boulevard, Niagara Falls, NY

EPA Region: II

Person(s) in Charge of Facility: Love Canal Revitalization Agency

Name of Reviewer: G. Florentino   Date: 12/17/90

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 an abandoned Methodist Church in the Love Canal area. In 1958, 23 tons of concrete reactor cells potentially contaminated with mercury were allegedly disposed on the church property to fill in low-lying areas. No other incidents of waste disposal are known to have occurred at this site. The site is located at 9610 Colvin Boulevard, between 96th and 97th Streets, Niagara Falls, New York. The soil and groundwater in the vicinity of the site are of major concern.

Scores: S_M = 5.19   (S_{gw} = 4.47 S_{sw} = 7.79 S_a = 0)

S_{FE} = not scored

S_{DC} = 0

Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2	4	6	
Net Precipitation	0 1 2 3	1	2	3	
Permeability of the Unsaturated Zone	0 1 2 3	1	2	3	
Physical State	0 1 2 3	1	0	3	
	Total Route Characteristics Score		8	15	
3 Containment	0 1 2 3	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	1	8	
	Total Waste Characteristics Score		19	26	
5 Targets					3.5
Ground Water Use	0 1 2 3	3	3	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
	Total Targets Score		3	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			2,565	57,330	
7 Divide line 6 by 57,330 and multiply by 100		S_{gw} =	4,47		

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	0 1 2 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 3	2	6	6	
Physical State	0 1 2 3	1	0	3	
	Total Route Characteristics Score		8	15	
3 Containment	0 1 2 3	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	1	8	
	Total Waste Characteristics Score		19	26	
5 Targets					4.5
Surface Water Use	0 1 2 3	3	9	9	
Distance to a Sensitive Environment	0 1 2 3	2	2	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	
	Total Targets Score		11	55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			5,016	64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{sw} = 7.79				

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
[1] Observed Release	0 45	1	0	45	5.1
Date and Location:					
Sampling Protocol:					
If line [1] is 0, the S_a = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2].					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a = 0			

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	4.47	19.98
Surface Water Route Score (S_{sw})	7.79	60.68
Air Route Score (S_a)	0	0
$S^2_{gw} + S^2_{sw} + S^2_a$		80.66
$\sqrt{S^2_{gw} + S^2_{sw} + S^2_a}$		8.98
$\sqrt{S^2_{gw} + S^2_{sw} + S^2_a} / 1.73 = S_M =$		5.19

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
	Total Targets Score			24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} = Not Scored			

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Incident	0 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1	3	3	8.2
3 Containment	0 15	1	0	15	8.3
4 Waste Characteristics Toxicity	0 1 2 3	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 5	4	20	20	
Distance to a Critical Habitat	0 1 2 3.	4	0	12	
Total Targets Score			20	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			0	21,600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =	0		

FIGURE 12
DIRECT CONTACT WORK SHEET

*Alternative Score: Dissolved lead was not detected, only total lead; therefore, an alternative score was determined using the other compounds detected.

HRS Documentation Records

5.4

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 = 4,320 drums plus 80 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: 97th Street Methodist Church Site

Location: 9610 Colvin Boulevard

Date Scored: April 23, 1990

Person Scoring: Gene Florentino

Primary Source(s) of Information (e.g., EPA region, state, FIT, etc.):

Ref. 1
Ref. 3
Ref. 4
Ref. 5

Factors Not Scored Due to Insufficient Information:

Comments or Qualifications:

GROUNDWATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (3 maximum):

Lead (total)
Ref. 1

Rationale for attributing the contaminants to the facility:

Groundwater and soil samples collected on site.

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

Lockport dolomite
Ref. 2
Assigned value = 2
Top of bedrock 25 feet

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

Potentiometric surface
9 feet
Ref. 1

Depth from the ground surface to the lowest point of waste disposal/storage:

Unknown
Assigned value = 1

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

36 inches
Ref. 3

Mean annual or seasonal evaporation (list months for seasonal):

27 inches
Ref. 3

Net precipitation (subtract the above figures):

9 inches
Assigned value = 2

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Silt and clay lacustrine deposite
Ref. 2

Permeability associated with soil type:

10^{-5} - 10^{-4} cm/sec
0.63 - 2.0 inches/hour
Assigned value = 1
Ref. 3

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Solid (broken concrete reactor cells)
Assigned value = 0
Ref. 4

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Landfill, no liner, no collection system
Assigned value = 3
Ref. 4

Method with highest score:

Landfill, no liner, no collection system
Assigned value = 3
Ref. 4

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Lead
Ref. 1, 4

Compound with highest score:

Lead Score = 18
Ref. 3

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0. (Give a reasonable estimate even if quantity is above maximum.):

23 tons of broken reactor cells which may have contained mercury. Actual mercury or other contaminant content is unknown.
Ref. 5

Basis of estimating and/or computing waste quantity:

No evidence of reactor cells found; however, the waste is suspected to have been disposed.
Assigned value = 1
Ref. 1

* * *

5. TARGETS

Groundwater Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Groundwater is not used
Assigned value = 1
Ref. 4

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Groundwater is not used
Ref. 4

Distance to above well or building:

NA
Assigned value = 0

Population Served by Groundwater Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

None
Ref. 4

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

None
Ref. 4

Total population served by groundwater within a 3-mile radius:

NA

SURFACE WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

Surface water not tested
No surface water on site
Ref. 5, 6

Rationale for attributing the contaminants to the facility:

NA

* * *

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

<1%
Ref. 5, 6

Name/description of nearest downslope surface water:

Bergholtz Creek, 0.17 miles to the north of the site
Ref. 6

Average slope of terrain between facility and above-cited surface water body in percent:

<1%
Assigned value = 0
Ref. 6

Is the facility located either totally or partially in surface water?

No surface water on or near the site
Ref. 5, 6

Is the facility completely surrounded by areas of higher elevation?

No. Surrounding areas are flat-lying with the exception of the clay-capped area of Love Canal to the south of the site
Ref. 5, 6

1-Year 24-Hour Rainfall in Inches

2.1 inches
Assigned value = 2
Ref. 3

Distance to Nearest Downslope Surface Water

0.17 miles (Bergholtz Creek)
Assigned value = 3
Ref. 6

Physical State of Waste

Solid (broken concrete reactor cells)
Assigned value = 0
Ref. 4

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Landfill, no liner, no collection system
Ref. 4

Method with highest score:

Landfill, no liner, no collection system
Assigned value = 3

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

No surface water tested; however, high levels of lead were found in the groundwater.
Ref. 1, 4

Compound with highest score:

Lead
Score = 18
Ref. 3

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0. (Give a reasonable estimate even if quantity is above maximum.):

23 tons of broken reactor cells which may have contained mercury.
Actual mercury or other contaminant content is unknown.

Basis of estimating and/or computing waste quantity:

Waste quantity unknown
Assigned value = 1
Ref. 4

* * *

5. TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Drinking water, recreation
Assigned value = 3
Ref. 6, 7, 8

Is there tidal influence?

No

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None
Western New York State is not a coastal area
Assigned value = 0

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

P FO/SS 1Ad (1 mile to SE)	PF01A (1 mile to NNW)
PF01A (1/2 mile to ESE)	P FO/SS 1Ad (0.9 mile to NW)
Assigned value = 1	R20WH (1 mile to south)
Ref. 9	

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None
Assigned value = 0
Ref. 4

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None within 3 miles
Ref. 10

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

NA

Total population served:

NA

Name/description of nearest of above water bodies:

Distance to above-cited intakes, measured in stream miles:

>3 miles
Assigned value = 0
Ref. 10

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected:

Air samples were not analytically sampled and tested. The site was screened with an HNu and Mercury Vapor Analyzer, and no organic or mercury vapors were detected.
Assigned value = 0
Ref. 5

Date and location of detection of contaminants:

NA

Methods used to detect the contaminants:

NA

Rationale for attributing the contaminants to the site:

NA

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not sampled
Ref. 1, 4

Most incompatible pair of compounds:

NA

Toxicity

Most toxic compound:

Hazardous Waste Quantity

Total quantity of hazardous waste:

23 tons of broken concrete reactor cells possibly contaminated with mercury. Actual mercury content unknown.

Basis of estimating and/or computing waste quantity:

Reports from Olin Chemical
Assigned value = 1
Ref. 4

* * *

3. TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi	0 to 1 mi	0 to 1/2 mi	0 to 1/4 mi
61,466	11,871		

Assigned value = 24
Ref. 11

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None
Assigned value = 0
Ref. 4

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

P FO/SS 1Ad (1 mile to SE)
PF01A (1/2 mile to ESE)
R20WH (1 mile to south)
PF01A (1 mile to NNW)
P FO/SS 1Ad (0.9 mile to NW)
Assigned value = 1
Ref. 9

Distance to critical habitat of an endangered species, if 1 mile or less:

None within 3 miles
Assigned value = 0
Ref. 10

Land Use

Distance to commercial/industrial area, if 1 mile or less:

2,750 feet
Assigned value = 1
Ref. 6

Distance to national or state park, forest, wildlife reserve, if 2 miles or less:

None
Assigned value = 0
Ref. 4, 5

Distance to residential area, if 2 miles or less:

Adjacent
Assigned value = 3
Ref. 5, 6

Distance to agricultural land in production within past 5 years, if 1 mile or less:

None
Assigned valule = 0
Ref. 4, 6

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None
Assigned value = 0
Ref. 4, 6

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

No
Assigned value = 0
Ref. 4

F I R E   A N D   E X P L O S I O N

1. CONTAINMENT

Hazardous substances present:

No fire hazard at site
Ref. 12

Type of containment, if applicable:

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

No readings with O_2/explosimeter
Assigned value = 0
Ref. 1

Ignitability

Compound used:

Reactivity

Most reactive compound:

Incompatibility

Most incompatible pair of compounds:

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

23 tons of broken concrete reactor cells, potentially contaminated with mercury. Actual mercury content is unknown.

Basis of estimating and/or computing waste quantity:

Reports from Olin Chemical
Ref. 4

* * *

3. TARGETS

Distance to Nearest Population

Adjacent (51 - 200 feet)
Assigned value = 4
Ref. 5, 6

Distance to Nearest Building

On site
Assigned value = 3
Ref. 5, 6

Distance to a Sensitive Environment

Distance to wetlands:

1/2 mile
Assigned value = 0
Ref. 9

Distance to critical habitat:

None
Assigned value = 0
Ref. 4

Land Use

Distance to commercial/industrial area, if 1 mile or less:

2,750 feet
Assigned value = 1
Ref. 6

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

None
Assigned value = 0
Ref. 4, 6

Distance to residential area, if 2 miles or less:

Adjacent
Assigned value = 3
Ref. 5, 6

Distance to agricultural land in production within past 5 years, if 1 mile or less:

None
Assigned value = 0
Ref. 4, 6

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None
Assigned value = 0
Ref. 4, 6

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

No
Assigned value = 0
Ref. 4

Population Within 2-Mile Radius

27,472
Assigned value = 5
Ref. 11

Buildings Within 2-Mile Radius

9,720 (occupied units), >2,600 buildings
Assigned value = 5
Ref. 11

D I R E C T   C O N T A C T

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No incidents on record
Ref. 4

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

No barriers
Assigned value = 3
Ref. 5

* * *

3. CONTAINMENT

Type of containment, if applicable:

Broken concrete reactor cells are buried
Assigned value = 0
Ref. 4

* * *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

1,4-dichlorobenzene	Score = 15
2,4-dinitrotoluene	Score = 15
Lead	Score = 18

Ref. 3

Compound with highest score:

Lead
1,4-dichlorobenzene (alternate score because only total lead was detected)

* * *

5. TARGETS

Population Within One-Mile Radius

11,871
Assigned value = 5
Ref. 11

Distance to Critical Habitat (of endangered species)

None within 1 mile
Assigned value = 0
Ref. 4

REFERENCES

If the entire reference is not available for public review in the EPA regional files on this site, indicate where the reference may be found.

Reference Number	Description of the Reference
1	Ecology and Environment Engineering, P.C., 1990, Draft Phase II Investigation of the 97th Street Methodist Church Site, Niagara Falls, New York, for the New York State Department of Environmental Conservation. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
2	Higgins, V.A., P.S. Puglia, R.P. Leonard, T.D. Yoakum, and W.A. Wirtz, 1972, Soil Survey of Niagara County, New York, United States Department of Agriculture, Soil Conservation Service, Cornell, New York.
3	Uncontrolled Hazardous Waste Site Ranking Systems, A Users Manual, National Oil and Hazardous Substances, Contingency Plan, Appendix A (40 CFR) (47 FR 31219), July 16, 1982. Document location: Ecology and Environment, Inc., Buffalo, New York.
4	New York State Department of Environmental Conservation, January 1986, Engineering Investigation at Inactive Hazardous Waste Sites in the State of New York, Phase I Investigations, 97th Street Methodist Church, Site Number 932084A, City of Niagara Falls, Niagara County, New York, prepared by Engineering Science and Dames and Moore. Document location: NYSDEC, Albany, New York.
5	Ecology and Environment Engineering, P.C., October 11, 1989, Site Inspection (EPA Documentation Forms, Section 5 of this report). Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
6	United States Geological Survey, 1980, Tonawanda West, New York Quadrangle, Niagara County, New York, 7.5-Minute Series (Topographic), Washington, D.C.
7	Evans, J., January 24, 1990, personal communication, New York State Department of Environmental Conservation, Division of Fish and Wildlife, Olean, New York.
8	McKeown, P., March 13, 1990, personal communication, New York State Department of Environmental Conservation, Division of Fish and Wildlife, Olean, New York.
9	United States Department of the Interior, 1978, National Wetlands Inventory Map, Tonawanda West, New York, Washington, D.C.
10	R&D Engineering, 1987, Niagara County Water District Water Supply and Transmission System, Plate I. Document Location: Ecology and Environment, Inc., Buffalo, New York.
11	General Sciences Corporation, 1987, Graphical Exposure Modeling System Users Guide, Volume I: Core Manual, United States Environmental Protection Agency, Washington, D.C.
12	Shiah, R., March 15, 1990, personal communication, Battalion Chief, City of Niagara Falls Fire Department, Niagara Falls, New York. Document location: Ecology and Environment, Inc., Buffalo New York.

REFERENCE 1

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

PHASE II INVESTIGATIONS

97th Street Methodist Church (Site Number 932084A)
City of Niagara Falls, Niagara County

MAY 1990

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., Director

Prepared by:

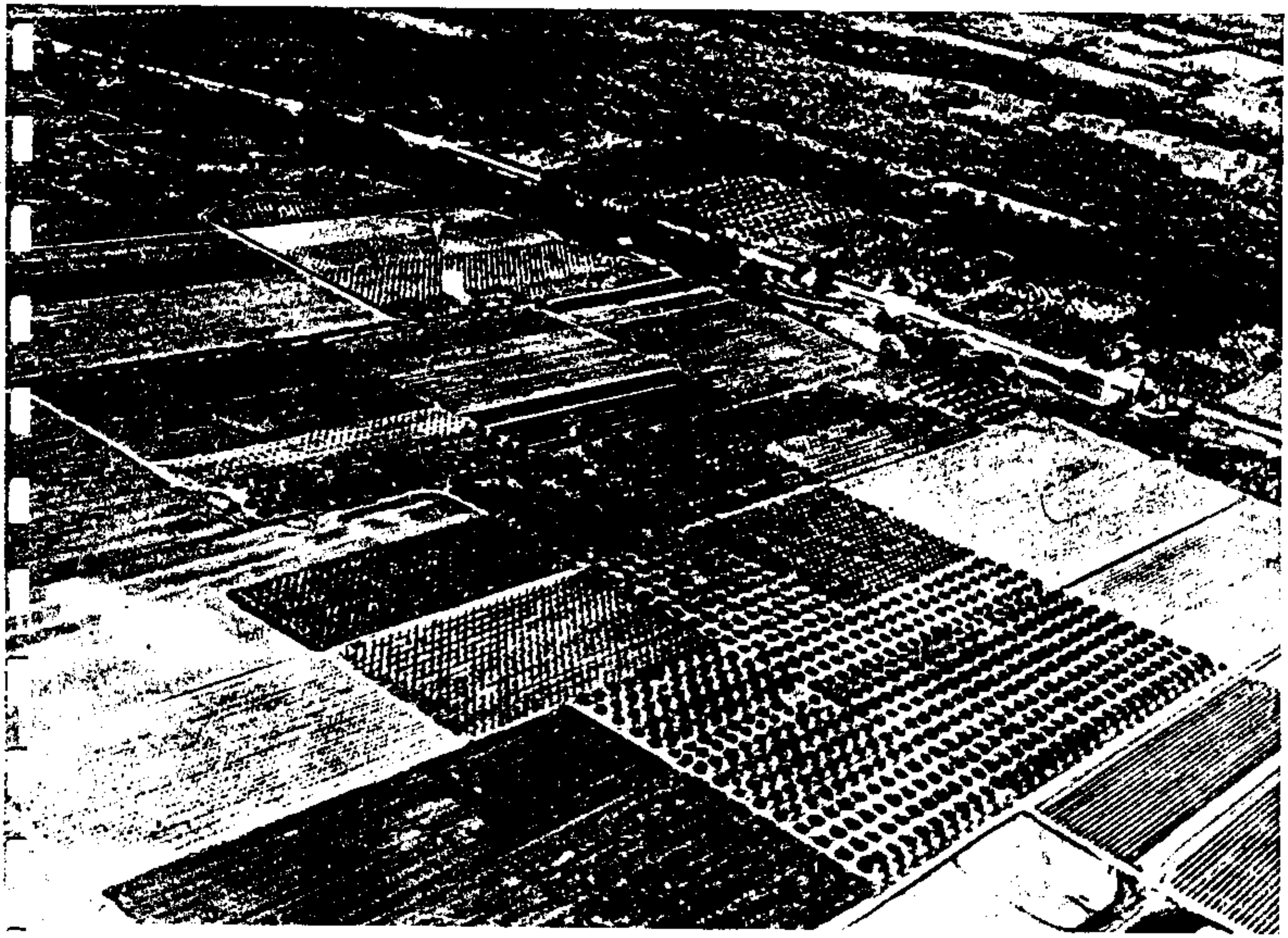
Ecology and Environment Engineering, P.C.

REFERENCE 2

03-N5
2

SOIL SURVEY OF

Niagara County, New York



Farnished by:
Soil Conservation Service
Farm & Home Center
4487 Lake Avenue
Lockport, New York 14094
Phone 434-4949

United States Department of Agriculture
Soil Conservation Service
In cooperation with
Cornell University Agricultural Experiment Station

Issued October 1972

recycled paper (15)

Property of Ecology & Environment, Inc.
195 Sugg Rd.
P.O. Box D
Buffalo N.Y. 14225

5-26

Rosslyn
1700 N. Moore
Arlington, VA 22209

REFERENCE 3

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984 recycled paper

REFERENCE 4

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

MAY 2 2

97TH STREET CHURCH SITE
9610 COLVIN BLVD.
NYS SITE NUMBER 932084A
CITY OF NIAGARA FALLS
NIAGARA COUNTY
NEW YORK STATE, 14304

Prepared For

DIVISION OF SOLID AND HAZARDOUS WASTE
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD
ALBANY, NEW YORK 12233-0001

Prepared By

ENGINEERING-SCIENCE
290 ELWOOD DAVIS ROAD
LIVERPOOL, NEW YORK 13088

In Association With

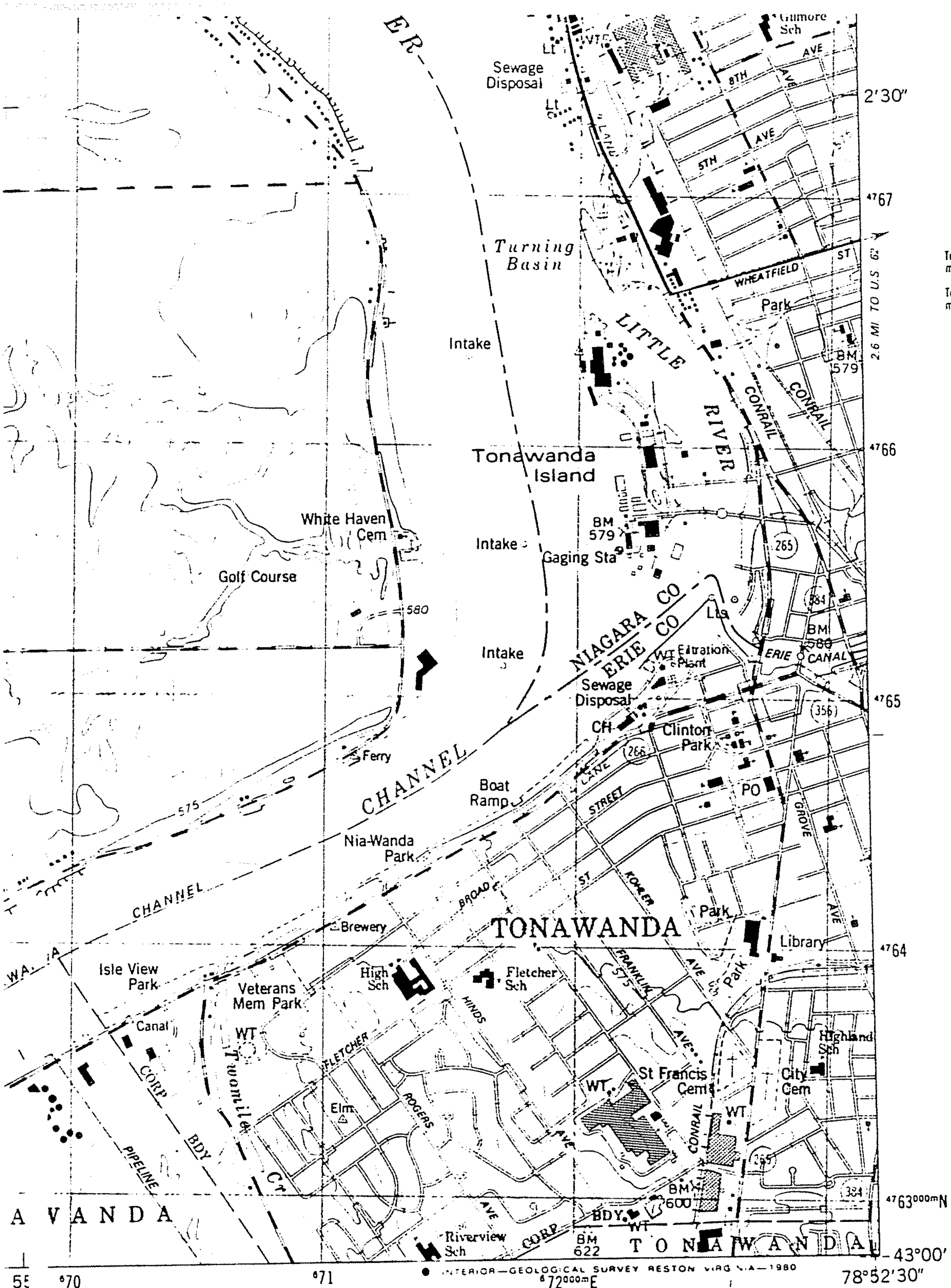
DAMES & MOORE
2996 BELGIUM ROAD
BALDWINSVILLE, NEW YORK 13027

DATE OF SUBMITTAL: JANUARY, 1986

REFERENCE 5

EPA DOCUMENTATION FORMS,
SECTION 5 OF THIS REPORT

REFERENCE 6



Feet	Meters
1	.3048
2	.6096
3	.9144
4	1.2192
5	1.5240
6	1.8288
7	2.1336
8	2.4384
9	2.7432
10	3.0480

To convert feet to meters multiply by .3048

To convert meters to feet multiply by 3.2808

(BUFFALO NE) 5269 IV NE

MILE

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

Interstate Route U S Route State Route

NEW YORK

QUADRANGLE LOCATION

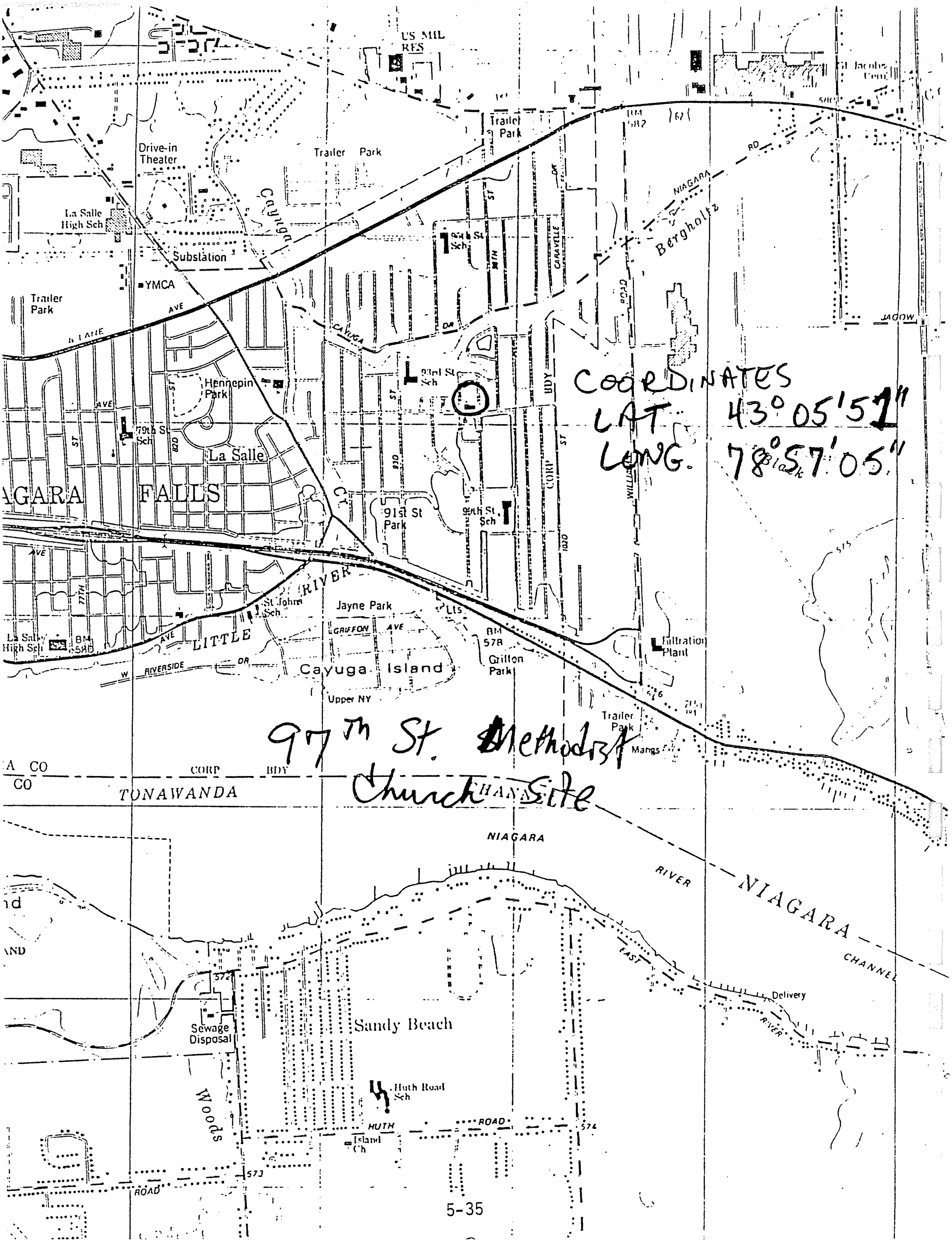
TONAWANDA WEST, N. Y.

SW/4 TONAWANDA 15' QUADRANGLE

N4300-W7852.5/7.5

1980

DMA 5270 III SW-SERIES V821



COORDINATES
LAT. 43°05'52"
LONG. 78°57'05"
97th St. Methodist Church Site
US MIL RES
St Jacobs Cem
Trailer Park
Drive-in Theater
La Salle High Sch
Cayuga
Substation
YMCA
Niagara Rd
Bergholtz
95th St Sch
93rd St Sch
Hennepin Park
79th St Sch
La Salle
NIAGARA FALLS
91st St Park
99th St Sch
Corp Bdy
Williams Road
Black
Filtration Plant
St Johns Sch
Jayne Park
Little River
Griffon Ave
Cayuga Island
Griffon Park
W Riverside Dr
Upper NY
Mangs
Tonawanda Channel
Niagara River
Niagara
River
Channel
East River
Delivery
Sandy Beach
Sewage Disposal
Woods
Huth Road Sch
Huth Road
Island Ch
Road

REFERENCE 7

CONTACT REPORT

Meeting [ ]   Telephone [X]   Other [ ]

AGENCY: NYSDEC, Fish and Wildlife Division

ADDRESS: 128 South Street
Olean, NY 14760

PHONE NO.: 716-372-8676

PERSON CONTACTED: Joe Evans

TO: YO-7000 File

FROM: G. Florentino GF

DATE: Jan. 24, 1990

SUBJECT: Stream Classification and Fisheries Information

CC:

The following information was obtained regarding the streams in the vicinity of the 97th Methodist Church site:

Cayuga Creek: From the mouth to the area between LaSalle High School and the Drive-in Theater, it is Class C, then it becomes Class D to its source.

Bergholtz Creek: Entire Stream is Class D.

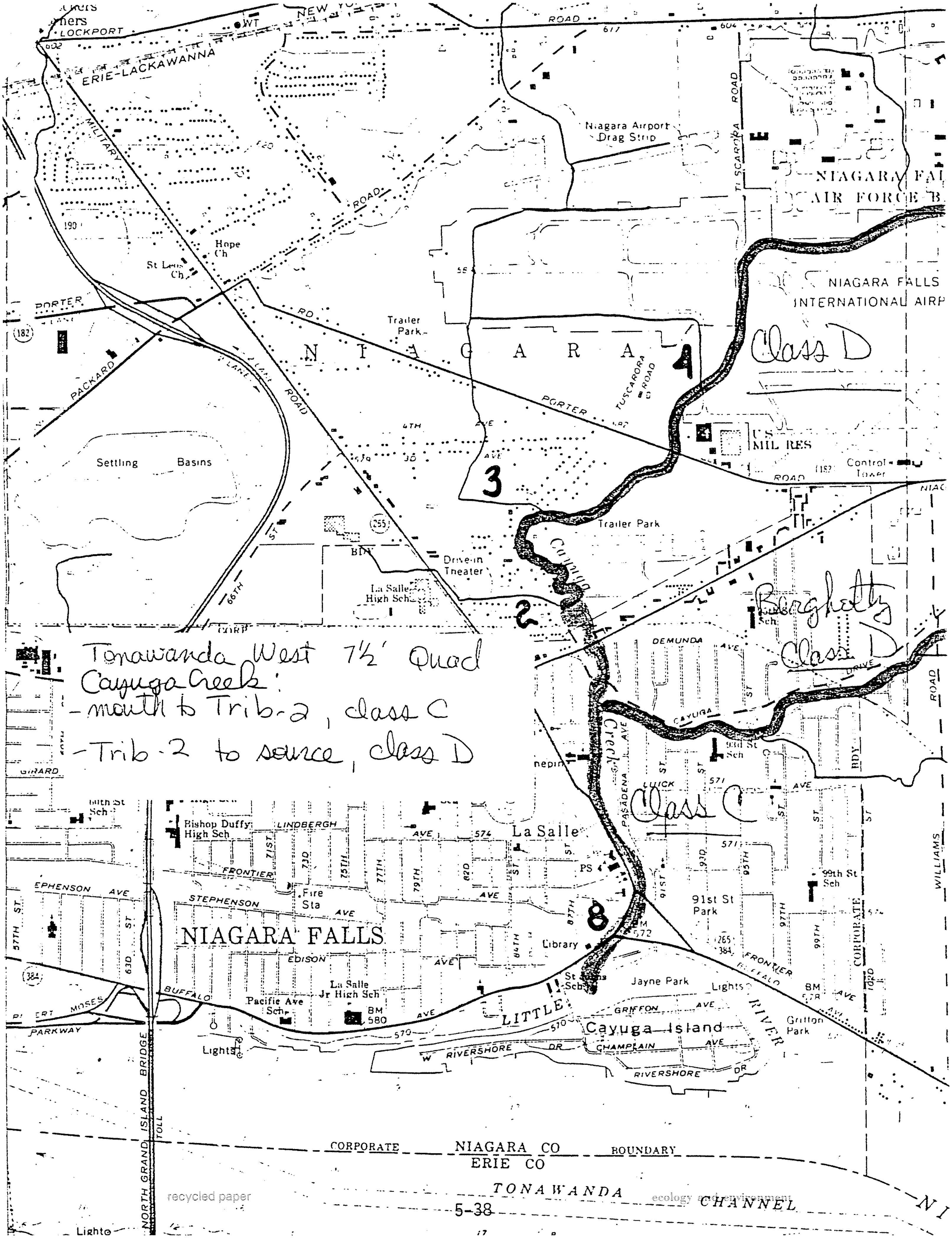
Mr. Evans will send copies of fisheries information.

oio
CR-YO7020

Joseph T Evans
Signature of Approval

Sr. Aquatic Biologist
Title

Feb 12, 1990
Date


Tonawanda West 7½' Quad
Cayuga Creek:
-mouth to Trib-2, class C
-Trib-2 to source, class D
Class D
Bergholtz
Class D
Class C
1
2
3
8
LOCKPORT
ERIE-LACKAWANNA
MILITARY
ROAD
Niagara Airport
Drag Strip
TUSCARORA ROAD
NIAGARA FALLS
AIR FORCE B
NIAGARA FALLS
INTERNATIONAL AIRP
Hope Ch
PORTER
PACKARD
N I A G A R A
Trailer Park
TUSCARORA ROAD
PORTER ROAD
US MIL RES
Control Tower
Settling Basins
66TH ST
Trailer Park
Drive-in Theater
La Salle High Sch
DEMUNDA AVE
CAYUGA DRIVE
Cayuga Creek
PASADENA AVE
93d St Sch
LUICK AVE
GIRARD
60th St Sch
Bishop Duffy High Sch
LINDBERGH AVE
La Salle
FRONTIER
STEPHENSON AVE
Fire Sta
99th St Sch
91st St Park
NIAGARA FALLS
Library
EDISON AVE
La Salle Jr High Sch
Pacific Ave Sch
Jayne Park
BUFFALO AVE
LITTLE RIVER
GRIFFON AVE
Cayuga Island
CHAMPLAIN AVE
RIVERSHORE DR
Griffon Park
CORPORATE
WILLIAMS ROAD
PARKWAY
NORTH GRAND ISLAND BRIDGE
Lights
CORPORATE NIAGARA CO BOUNDARY
ERIE CO
TONAWANDA CHANNEL

REFERENCE 8

CONTACT REPORT

Meeting [ ]   Telephone [X]   Other [ ]

AGENCY: NYSDEC

ADDRESS: 128 South Street
Olean, NY 14760

PHONE NO.: 716-372-8676

PERSON CONTACTED: Paul McKeown

TO: YO-7000 File

FROM: G. Florentino

DATE: March 13, 1990

SUBJECT: Stream Classification of the Niagara River

CC:

Niagara River is Class A^{-} between confluence of Lake Ontario to Lake Erie, from the international boundary to American shore.

Class A^{-} - is the same as Class A, but it is used when classifying waters along international boundaries.

oio
CR-YO7010

[illegible]
Signature

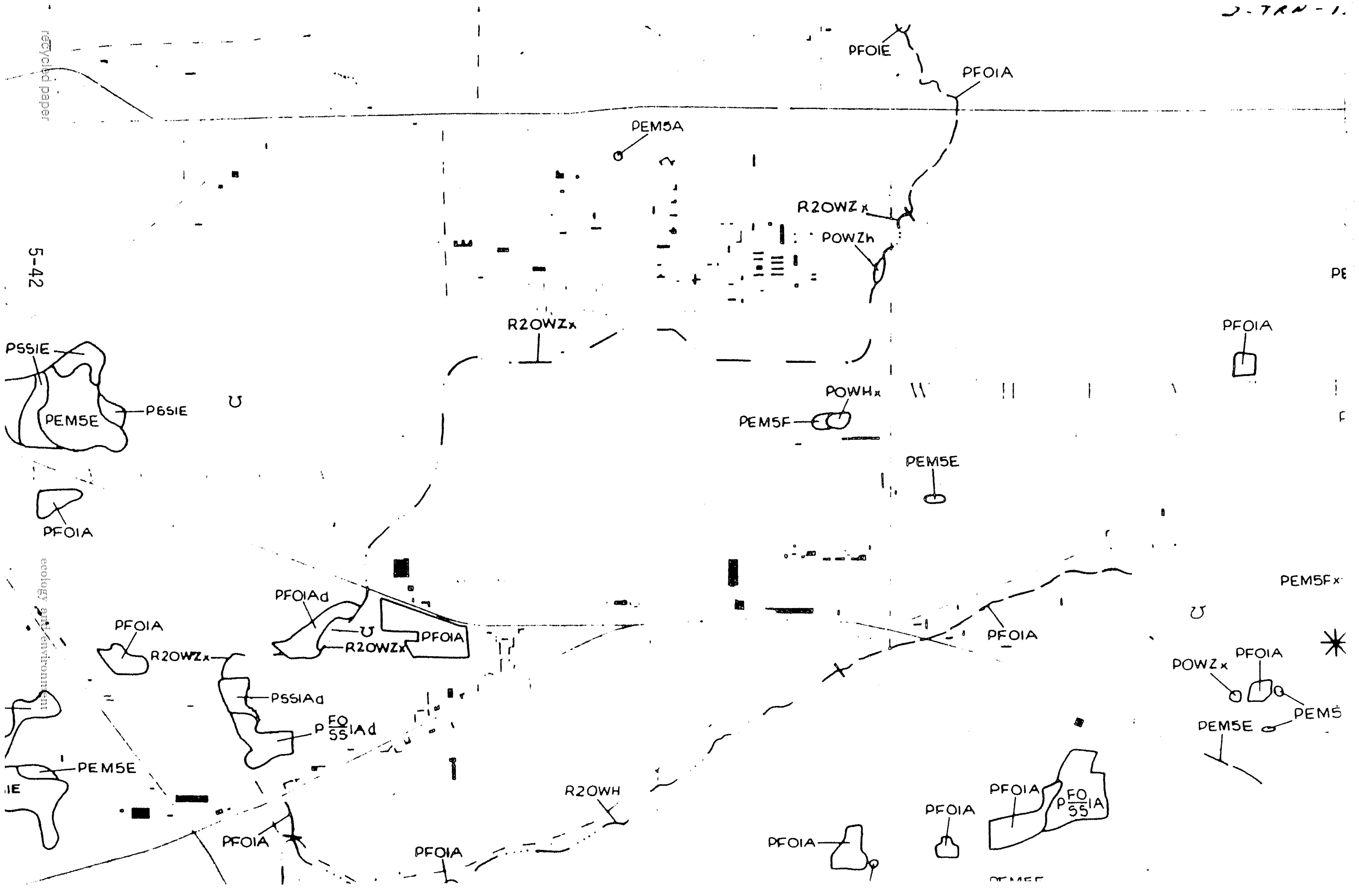
Senior Aquatic Biologist
Title

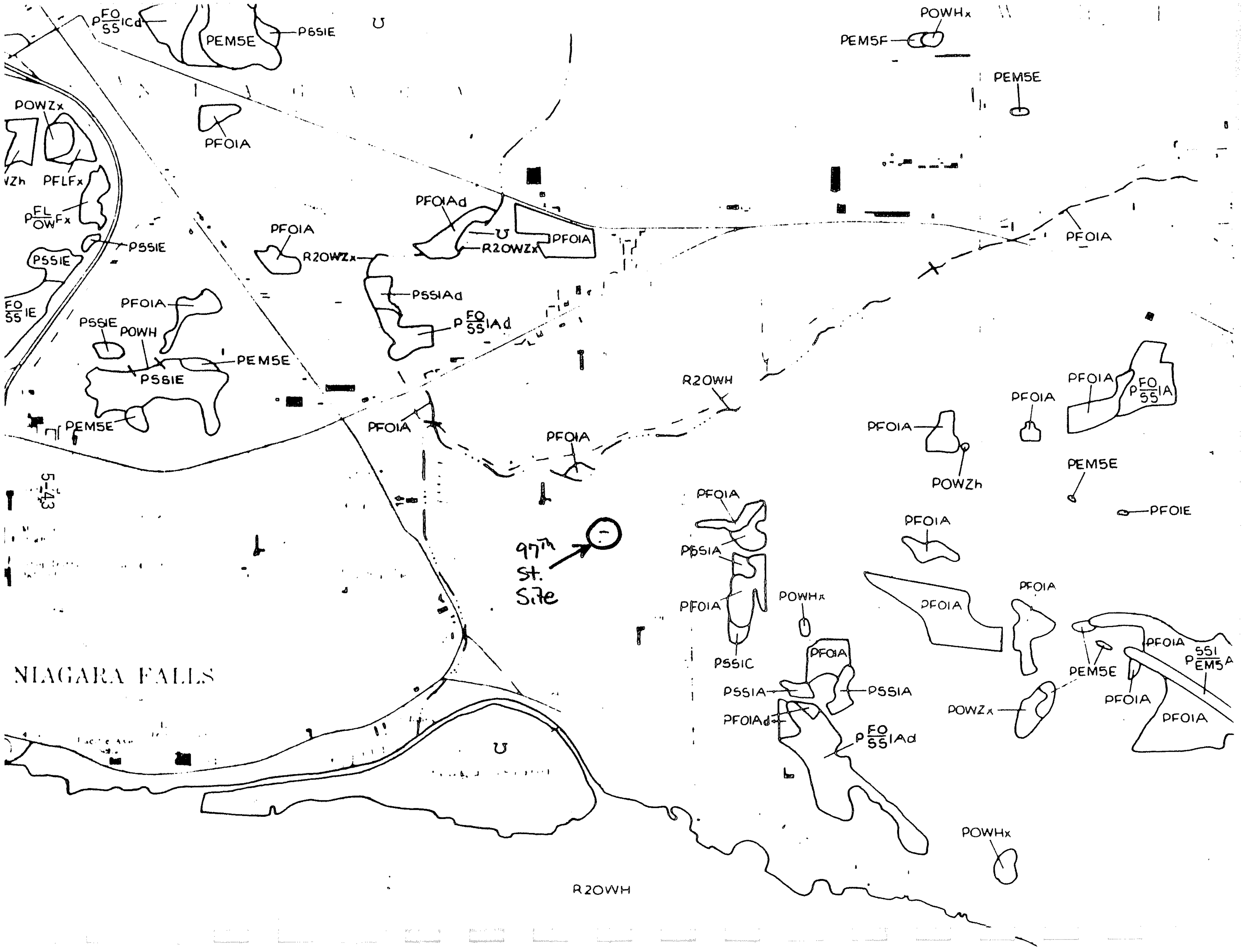
3/20/90
Date

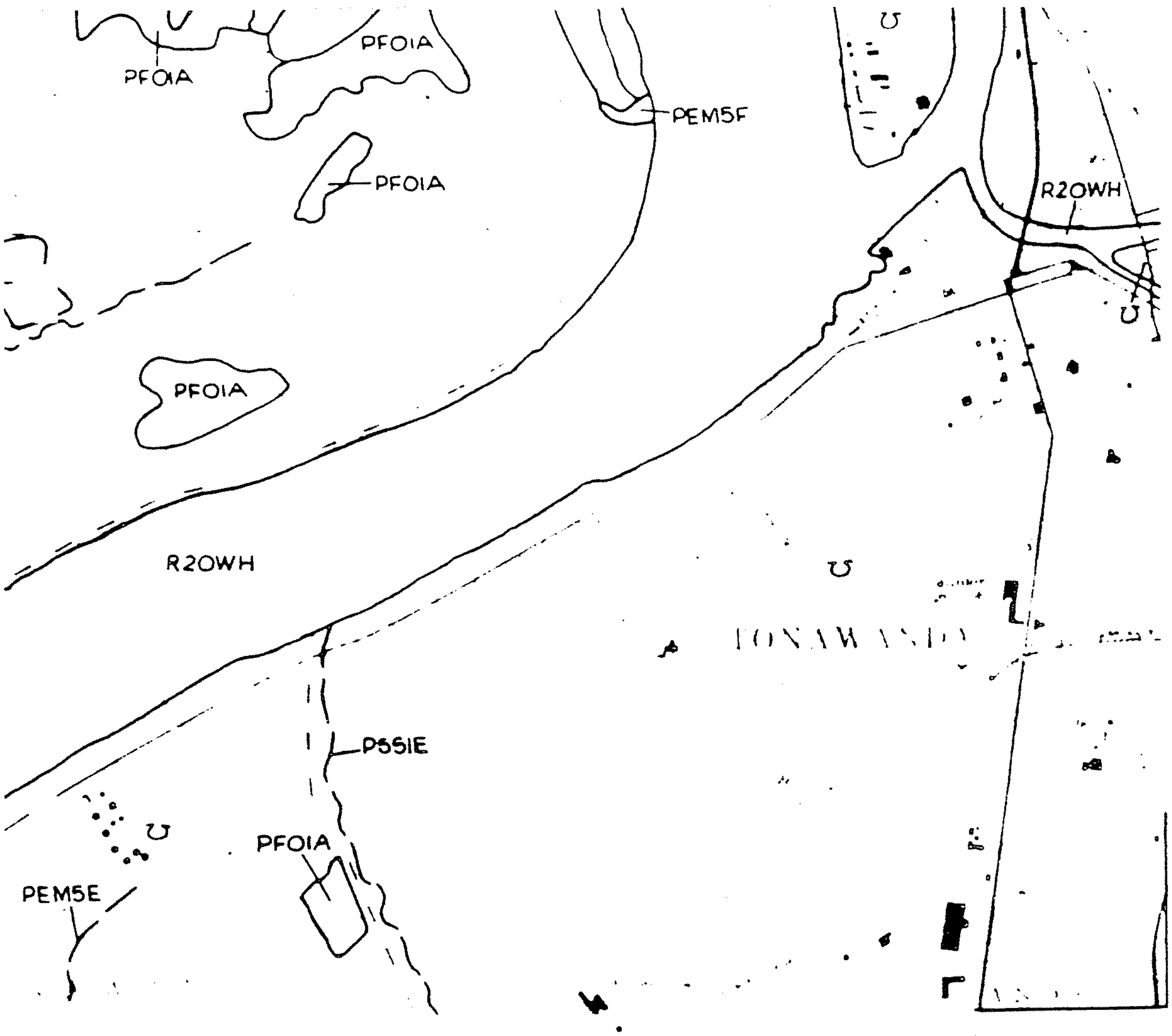
REFERENCE 9

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR




97th St. Site
NIAGARA FALLS
R2OWH
R2OWZx
PFOIA
PFOIAd
PFOIE
PSSIA
PSSIAd
PSSIC
PSSIE
PEM5E
PEM5F
POWHx
POWH
POWZx
POWZh
PFLFx
U



TONAWANDA WEST, NY

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*)
- Dominance type (either vegetative or sedentary animal) can be added to the map by the interested user
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated
- Some areas designated R4SB, R4SBW, or R4SBJ (intermittent streams) may not meet the definition of wetlands.

AERIAL PHOTOGRAPHY

DATE 10/ /78
SCALE 1 80 000
TYPE B-W

DATE / /
SCALE
TYPE

DATE /
SCALE
TYPE

U.S. DEPARTMENT OF THE INTERIOR

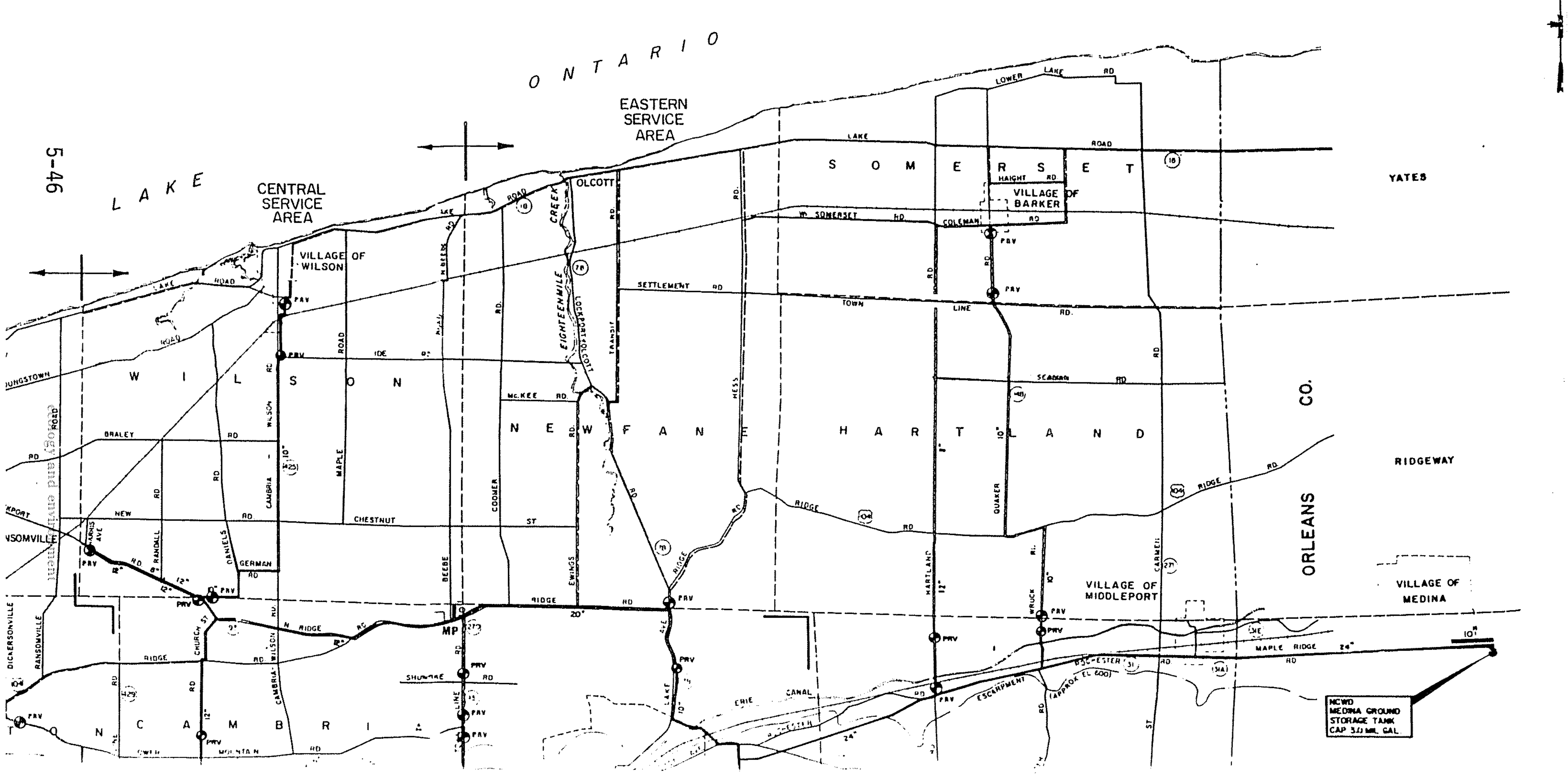
FISH AND WILDLIFE SERVICE

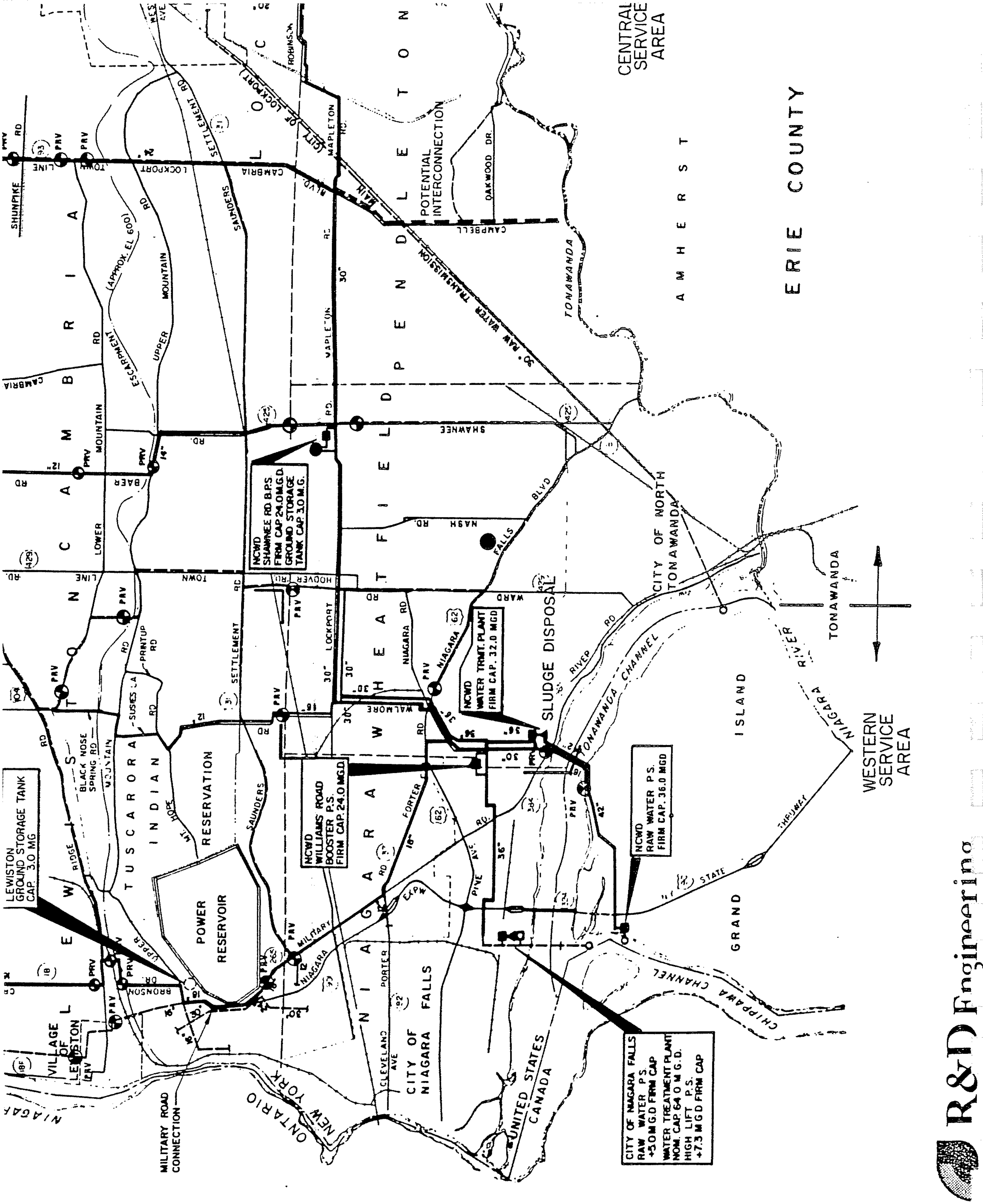
Prepared by Office of Biological Services for the National Wetlands Inventory

REFERENCE 10

NIAGARA COUNTY WATER DISTRICT

WATER SUPPLY AND TRANSMISSION SYSTEM




CENTRAL SERVICE AREA
ERIE COUNTY
A M H E R S T
WESTERN SERVICE AREA
LEWISTON GROUND STORAGE TANK CAP. 3.0 MG
NCWD SHAWNEE RD. B.P.S. FIRM CAP. 24.0 M.G.D. GROUND STORAGE TANK CAP. 3.0 M.G.
NCWD WILLIAMS' ROAD BOOSTER P.S. FIRM CAP. 24.0 M.G.D.
NCWD WATER TRMT. PLANT FIRM CAP. 32.0 MGD
NCWD RAW WATER P.S. FIRM CAP. 36.0 MGD
CITY OF NIAGARA FALLS RAW WATER P.S. +5.0 M.G.D FIRM CAP WATER TREATMENT PLANT NOM. CAP. 64.0 M.G.D. HIGH LIFT P.S. +7.3 M.G.D FIRM CAP
POTENTIAL INTERCONNECTION
30" RAW WATER TRANSMISSION MAIN
MILITARY ROAD CONNECTION
SLUDGE DISPOSAL
POWER RESERVOIR
TUSCARORA INDIAN RESERVATION
VILLAGE OF LEWISTON
CITY OF NIAGARA FALLS
CITY OF NORTH TONAWANDA
TONAWANDA
GRAND ISLAND
TONAWANDA CHANNEL
CHIPPAWA CHANNEL
NIAGARA RIVER
UNITED STATES
CANADA
NEW YORK
ONTARIO
L E W I S T O N
C A M B R I A
L O C K P O R T
N I A G A R A
W H E A T F I E L D
P E N D L E T O N
LOCKPORT RD.
SHAWNEE RD.
SAUNDERS SETTLEMENT RD.
UPPER MOUNTAIN RD.
LOWER MOUNTAIN RD.
ESCARPMENT (APPROX. EL 600)
MAPLETON RD.
CAMPBELL BLVD.
OAKWOOD DR.
NASH RD.
WARD RD.
WALMORE RD.
NIAGARA FALLS BLVD.
RIVER RD.
MILITARY RD.
PORTER RD.
PINE AVE.
CLEVELAND AVE.
HOOVER RD.
TOWN LINE RD.
BAER RD.
SHUNPIKE RD.
ROBINSON
R&D Engineering

REFERENCE 11

DRAFT

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 1. CORE MANUAL

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68023970
Project Officer: Russell Kinerson
Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION
6100 Chevy Chase Drive, Suite 200
Laurel, Maryland 20707

Submitted: February, 1987

REFERENCE 12

CONTACT REPORT

Meeting [ ]   Telephone [X]   Other [ ]

AGENCY: Niagara Falls Fire Department

ADDRESS: Public Safety Building
520 Hyde Park Blvd.
Niagara Falls, NY 14301

PHONE NO.: 716-286-4728

PERSON CONTACTED: Battalion Chief Richard Shiah
Chief of Fire Prevention

TO: YO-7000 File

FROM: G. Florentino

DATE: March 15, 1990

SUBJECT: Fire Hazard at 97th St. Methodist Church Site

CC:

Chief Shiah stated that there is no apparent fire hazard at the 97th Street Methodist Church site location at 9610 Colvin Blvd., between 96th and 97th Streets, Niagara Falls, NY, Chief Shiah plans on inspecting the church site.

oio
CR-Y07070

Richard J. Shiah
Signature

Chief of Fire Prevention
Title

3/20/90
Date

EPA 2070—13

5.5

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 1 - SITE LOCATION AND INSPECTION INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 932084A

II. SITE NAME AND LOCATION

01 Site Name (Legal, common, or descriptive name of site)	02 Street, Route No., or Specific Location Identifier
97th Street Methodist Church	9610 Colvin Boulevard

03 City	04 State	05 Zip Code	06 County	07 County Code	08 Cong. Dist.
Niagara Falls	NY	14304	Niagara		

09 Coordinates Latitude	Longitude	10 Type of Ownership (Check One)
4 3 0 4 5 1 .	7 8 5 7 0 5 .	[ ] A. Private [X] 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
10 / 11 / 89 Month Day Year	[ ] Active [X] Inactive	1958 (Beginning Year) | 1958 (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 [X] F. State Contractor Ecology & Env., Inc. (Name of Firm)

[ ] G. Other (Specify) ______

05 Chief Inspector	06 Title	07 Organization	08 Telephone No.
G. Florentino	Geologist	Ecology and Environment	(716) 684-8060
09 Other Inspectors	**10 Title**	**11 Organization**	**12 Telephone No.**
J. Nickerson	Geologist	Ecology and Environment	(716) 684-8060
			( )
			( )
			( )
			( )

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
Ashok K. Gupta	Sanitary Engineer	NYSDEC - Albany	(518) 451-0927
			( )
			( )
			( )
			( )

17 Access Gained by (Check one)	18 Time of Inspection	19 Weather Conditions
NYSDEC Permission	1030	Overcast, 50°F, light wind from north

IV. INFORMATION AVAILABLE FROM

01 Contact	02 Agency/Organization	03 Telephone No.
Walter Demick	NYSDEC - Albany	(518) 457-9538

04 Person Responsible for Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
J. Griffis		Ecology and Environment, Inc.	(716) 684-8060	10 / 12 / 89 Month Day Year

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 2 - WASTE INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 932084A

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 Physical States (Check all that apply)

[X] A. Solid
[ ] B. Powder, Fines
[ ] C. Sludge
[ ] D. Other ________ (Specify)
[ ] E. Slurry
[ ] F. Liquid
[ ] G. Gas

02 Waste Quantity at Site (Measure of waste quantities must be independent)

Tons 23
Cubic Yards ____
No. of Drums ____

03 Waste Characteristics (Check all that apply)

[X] A. Toxic
[ ] B. Corrosive
[ ] C. Radioactive
[X] D. Persistent
[X] E. Soluble
[ ] F. Infectious
[ ] G. Flammable
[ ] H. Ignitable
[ ] I. Highly volatile
[ ] J. Explosive
[ ] K. Reactive
[ ] L. Incompatible
[ ] M. Not applicable

III. WASTE TYPE

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	unknown		Mercury may be incorporated in concrete reactor cells

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

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)

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)

NYSDEC 1986 Phase I Investigation
NYSDEC 1989 Phase II Work Plan

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS	I. IDENTIFICATION 01 State: NY 02 Site Number: 932084N

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. Groundwater Contamination — 02 [X] Observed (Date 1980-1988) [ ] Potential [X] Alleged
03 Population Potentially Affected 11,871 — 04 Narrative Description

EPA onsite wells tested in 1980 indicated low concentrations of pesticides.
USGS onsite borings tested in 1982 indicated low concentrations of organics.
EPA wells tested in 1984 indicated low concentrations of pesticides, PAH's, and zinc.
EPA wells tested in 1988 indicated low concentrations of lead.

01 [ ] B. Surface Water Contamination — 02 [ ] Observed (Date ______) [ ] Potential [ ] Alleged
03 Population Potentially Affected ______ — 04 Narrative Description:

No surface water onsite.

01 [ ] C. Contamination of Air — 02 [X] Observed (Date 10/11/89) [ ] Potential [ ] Alleged
03 Population Potentially Affected ______ — 04 Narrative Description:

No air samples taken, however, the site was screened with a HNu and Mercury Vapor Analyzer and no readings above background were obtained.

01 [ ] D. Fire/Explosive Conditions — 02 [ ] Observed (Date ______) [ ] Potential [ ] Alleged
03 Population Potentially Affected ______ — 04 Narrative Description:

No record.

01 [ ] E. Direct Contact — 02 [ ] Observed (Date ______) [ ] Potential [ ] Alleged
03 Population Potentially Affected ______ — 04 Narrative Description:

No record.

01 [X] F. Contamination of Soil — 02 [X] Observed (Date 8/82) [ ] Potential [X] Alleged
03 Area Potentially Affected 11,871 — 04 Narrative Description:

Soil samples tested by USGS in 1982 indicated the presence of iron.

01 [ ] G. Drinking Water Contamination — 02 [ ] Observed (Date ______) [ ] Potential [ ] Alleged
03 Population Potentially Affected ______ — 04 Narrative Description:

Residences on municipal water.

01 [ ] H. Worker Exposure/Injury — 02 [ ] Observed (Date ______) [ ] Potential [ ] Alleged
03 Workers Potentially Affected ______ — 04 Narrative Description:

No record.

01 [ ] I. Population Exposure/Injury — 02 [ ] Observed (Date ______) [ ] Potential [ ] Alleged
03 Population Potentially Affected ______ — 04 Narrative Description:

No record.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

EPA

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)

I. IDENTIFICATION

01 State	02 Site Number
NY	932084A

II. HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)

01 [ ] J. Damage to Flora — 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
04 Narrative Description:

No record.

01 [ ] K. Damage to Fauna — 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
04 Narrative Description:

No record.

01 [ ] L. Contamination of Food Chain — 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
04 Narrative Description:

No record.

01 [ ] M. Unstable Containment of Wastes (Spills/Runoff/Standing liquids, Leaking drums) — 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
03 [ ] Population Potentially Affected ________ 04 Narrative Description:

No record.

01 [ ] N. Damage to Offsite Property — 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
04 Narrative Description:

No record.

01 [ ] O. Contamination of Sewers, Storm/ Drains, WWTPs — 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
04 Narrative Description:

No record.

01 [ ] P. Illegal/Unauthorized Dumping — 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
04 Narrative Description:

No record.

05 Description of Any Other Known, Potential, or Alleged Hazards

None.

III. TOTAL POPULATION POTENTIALLY AFFECTED 11,871 within one-mile radius

IV. COMMENTS

In 1958, Olin Chemical allegedly disposed of 23 tons of broken concrete reactor cells potentially contaminated with mercury at the 97th Street Methodist Church site; however, Olin Chemical claims it was disposed at the 99th Street Methodist Church site. The 99th Street site is now beneath the capped area of Love Canal.

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

NYSDEC 1986, Phase I Investigation
NYSDEC 1989, Phase II Work Plan
Ecology and Environment, Inc. October 11, 1989 Site Inspection
General Sciences Corp., 1987, 1980 Census information

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 4 - PERMIT AND DESCRIPTIVE INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 932084A

II. PERMIT INFORMATION

01 Type of Permit Issued (Check all apply)	02 Permit Number	03 Date Issued	04 Expiration Date	05 Comments
[ ] A. NPDES NA				
[ ] 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	04 Treatment (Check all that apply)	05 Other
[ ] A. Surface Impoundment			[ ] A. Incineration	[X] A. Buildings On Site
[ ] B. Piles			[ ] B. Underground Injection	
[ ] C. Drums, Above Ground			[ ] C. Chemical/Physical	
[ ] D. Tank, Above Ground			[ ] D. Biological	
[ ] E. Tank, Below Ground			[ ] E. Waste Oil Processing	2
[ ] F. Landfill			[ ] F. Solvent Recovery	06 Area of Site
[ ] G. Landfarm			[ ] G. Other Recycling Recovery	
[ ] H. Open dump fill on			[ ] H. Other ______ (specify)	1 Acres
[x] I. Other church grounds (Specify)	23	Tons		

07 Comments

23 tons of broken concrete reactor cells were used to fill low-lying areas.

IV. CONTAINMENT

01 Containment of Wastes (Check one)

[ ] A. Adequate, Secure [ ] B. Moderate [X] C. Inadequate, Poor [ ] D. Insecure, Unsound, Dangerous

02 Description of Drums, Diking, Liners, Barriers, etc.

None

V. ACCESSIBILITY

01 Waste Easily Accessible: [ ] Yes [X] No
02 Comments:
Potential concrete is buried.

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

NYSDEC 1986 Phase I Investigtion
NYSDEC 1989 Phase II Work Plan

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 State	02 Site Number
NY	932084A

II. DRINKING WATER SUPPLY

01 Type of Drinking Supply (Check as applicable)

	Surface	Well
Community	A. [X]	B. [ ]
Non-community	C. [ ]	D. [ ]

02 Status

Endangered	Affected	Monitored
A. [ ]	B. [ ]	C. [X]
D. [ ]	E. [ ]	F. [ ]

03 Distance to Site

A 0.66 (mi)

B ______ (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)

[X] D. Not Used, Unusable

02 Population Served by Groundwater 0

03 Distance to Nearest Drinking Water Well NA (mi)

04 Depth to Groundwater 9 (ft)

05 Direction of Groundwater Flow Unknown (south-west - perched)

06 Depth to Aquifer of Concern 9 (ft)

07 Potential Yield of Aquifer Unknown (gpd)

08 Sole Source Aquifer Unknown [ ] Yes [ ] No

09 Description of Wells (including usage, depth, and location relative to population and buildings)

None in immediate area

10 Recharge Area

[ ] Yes
[ ] No

Comments: Unknown

11 Discharge Area

[ ] Yes
[ ] No

Comments: Unknown

IV. SURFACE WATER

01 Surface Water (Check one)

[X] 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
Bergholtz Creek	[ ]	0.17 (mi)
Cayuga Creek	[ ]	0.59 (mi)
Niagara River	[ ]	0.66 (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. 11871	B. 24,472	C. 37,762
No. ofPersons	No. of Persons	No. of Persons

02 Distance to Nearest Population Adjacent (mi)

03 Number of Buildings Within Two (2) Miles of Site 5,579 (Occupied Units)

04 Distance to Nearest Off-Site Home Adjacent (mi)

05 Population within Vicinity of Site (Provide narrative description of nature of population within vicinity of site, i.e., rural, village, densely populated urban area)

The site is directly across from the secured area of Love Canal. The area is urban; however, many of the adjacent homes are abandoned, but some families are still living in the area.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA (Cont.)	I. IDENTIFICATION 01 State: NY 02 Site Number: 932084A

VI. ENVIRONMENTAL INFORMATION

01 Permeability of Unsaturated Zone (Check one)

[X] 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)

[ ] A. Impermeable (Less than 10^{-6} cm/sec)   [ ] B. Relatively Impermeable ($10^{-4} - 10^{-6}$ cm/sec)   [X] 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
25 (ft)	unknown	5.6-7.6

06 Net Precipitation	07 One Year 24-Hour Rainfall	08 Site Slope	Direction of Site Slope	Terrain Average Slope
9 (in)	2.1 (in)	<1 %	flat	<1 %

09 Flood Potential	10
(Preliminary Revised) Site is in 100 Year Floodplain	[ ] Site is on Barrier Island, Coastal High Hazard Area, Riverine Floodway

11 Distance to Wetlands (5 acre minimum)	12 Distance to Critical Habitat (of endangered species)
ESTUARINE NA A. ____ (mi) OTHER B. 0.28 (mi)	NA (mi) Endangered Species: ____

13 Land Use in vicinity

Distance to:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREA; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. 1.2 (mi)	B. 0 (mi)	C. 0.25 (mi)	D. 0.28 (mi)

14 Description of Site in Relation to Surrounding Topography

The site and the surrounding topography are flat-lying, covered with grass, concrete, and asphalt. Storm sewers collect runoff from the site and surrounding areas.

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

Ecology and Environment, Inc., October 11, 1989, Site Inspection
NYSDEC 1986 Phase I Investigation
NYSDEC 1988 Work Plan
United States Department of Agriculture, Soil Conservation Service, Soils of Niagara County

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 6 - SAMPLE AND FIELD INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 932084A

II. SAMPLES TAKEN - No samples taken during S.I. NONE

Sample Type	01 Number of Samples Taken	02 Samples Sent to	03 Estimated Date Results Available
Groundwater			
Surface Water			
Waste			
Air			
Runoff			
Spill			
Soil			
Vegetation			
Other			

III. FIELD MEASUREMENTS TAKEN

01 Type	02 Comments
Organic Vapors	Site screened with HNu Photoionizer
Mercury Vapor	Site screened with Mercury Vapor Analyzer

IV. PHOTOGRAPHS AND MAPS

01 Type [X] Ground [ ] Aerial

02 In Custody of Ecology and Environment, Inc.
(Name of Organization or Individual)

03 Maps
[X] Yes
[ ] No

04 Location of Maps
Site sketch in Ecology and Environment, Inc. Logbook

V. OTHER FIELD DATA COLLECTED (Provide narrative description of sampling activities)

NONE

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

Ecology and Environment, Inc., October 11, 1989 Site Inspection

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 7 - OWNER INFORMATION	I. IDENTIFICATION	
	01 State NY	02 Site Number 932084A

II. CURRENT OWNER(S)				PARENT COMPANY (if applicable)		
01 Name Love Canal Revitalization Agency		02 D+B Number		08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City Niagara Falls	06 State NY	07 Zip Code		12 City	13 State	14 Zip Code
01 Name		02 D+B Number		08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code
01 Name		02 D+B Number		08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code
01 Name		02 D+B Number		08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (if applicable, most recent first)		
01 Name Western NY Conference (Wesley United Methodist Church)		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 Niagara Falls	06 State NY	07 Zip Code	05 City	06 State	07 Zip Code
01 Name Mary Ann Nye Johnston		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 Mabel George		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)

NYSDEC 1989 Phase II Work Plan

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 8 - OPERATOR INFORMATION - NA	I. IDENTIFICATION 01 State: NY 02 Site Number: 932084A

II. CURRENT OPERATOR (if different from Owner) | **OPERATOR'S PARENT COMPANY (if applicable)**

01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner				

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner) | **PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)**

01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				
01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				
01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				

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: NY 02 Site Number: 932084A

II. ON-SITE GENERATOR - NA

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) - NA

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) - NA

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: NY 02 Site Number: 932084A

II. PAST RESPONSE ACTIVITIES

01 [ ] A. Water Supply Closed — 02 Date ______ 03 Agency ______
04 Description:
None on Record.

01 [ ] B. Temporary Water Supply Provided — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] C. Permanent Water Supply Provided — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] D. Spilled Material Removed — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] E. Contaminated Soil Removed — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] F. Waste Repackaged — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] G. Waste Disposed Elsewhere — 02 Date ______ 03 Agency ______
04 Description:
None on record

01 [X] H. On-Site Burial — 02 Date 1958 03 Agency ______
04 Description:
Olin Chemical alleged disposed 23 tons of broken concrete reactor cells.

01 [ ] I. In Situ Chemical Treatment — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] J. In Situ Biological Treatment — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] K. In Situ Physical Treament — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] L. Encapsulation — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] M. Emergency Waste Treatment — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] N. Cutoff Walls — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] O. Emergency Diking/Surface Water Diversion — 02 Date ______ 03 Agency ______
04 Description:
None on Record

01 [ ] P. Cutoff Trenches/Sump — 02 Date ______ 03 Agency ______
04 Description:
None on Record

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 10 - PAST RESPONSE ACTIVITIES (Cont.)	I. IDENTIFICATION	
	01 State NY	02 Site Number 932084A

II. PAST RESPONSE ACTIVITIES (Cont.)

01 [ ] Q. Subsurface Cutoff Wall 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] R. Barrier Walls Constructed 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] S. Capping/Covering 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] T. Bulk Tankage Repaired 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] U. Grout Curtain Constructed 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] V. Bottom Sealed 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] W. Gas Control 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] X. Fire Control 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [ ] Y. Leachate Treatment 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [X] Z. Area Evacuated 02 Date ________ 03 Agency ________
04 Description:
Area was evacuated because of proximity to Love Canal

01 [ ] 1. Access to Site Restricted 02 Date ________ 03 Agency ________
04 Description:
None on Record

01 [X] 2. Population Relocated 02 Date ________ 03 Agency ________
04 Description:
Church services no longer held; adjacent families relocated due to proximity to Love Canal

01 [ ] 3. Other Remedial Activities 02 Date ________ 03 Agency ________
04 Description:

1980 EPA installed and tested 2 groundwater monitoring wells
1982 USGS installed 4 soil borings and tested soil and groundwater
1984 & 1988 NYDEC sampled EPA wells

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

NYSDEC 1986 Phase I Investigation
NYSDEC 1989 Phase II Work Plan

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 11 - ENFORCEMENT INFORMATION	I. IDENTIFICATION	
	01 State	02 Site Number
	NY	932084A

II. ENFORCEMENT INFORMATION

01 Past Regulatory/Enforcement Action [X] Yes [ ] No

02 Description of Federal, State, Local Regulatory/Enforcement Action

A Phase I investigation was performed by NYSDEC. No other enforcement action has taken place.

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

NYSDEC 1986 Phase I Investigation
NYSDEC 1989 Phase II Work Plan

6

recycled paper
ecology and environment

6

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Appendices

APPENDIX A

SITE-SPECIFIC SAFETY PLAN AND DRILLING SITE SAFETY CHECKLIST

ecology and environment, inc.

SITE SAFETY PLAN

Version 988

A. GENERAL INFORMATION

Project Title: 97th St Methodist Church
Project No.: Y0-7020/7030/7060
TDD/Pan No.:
Project Manager: G. Florentino
Project Dir.:
Location(s): 9610 Colvin Blvd. (Btwn 96th & 97th sts.) Niagara Falls, NY 14304
Prepared by: G. Florentino
Date Prepared: 10/3/89
Approval by: [signature] corp. H/S group
Date Approved: 5 Oct 89
Site Safety Officer Review:
Date Reviewed:
Scope/Objective of Work: Site Reconnaissance, ~~and~~ Geophysical Survey, ~~and~~ Surficial Soil Sampling, and drilling and monitoring well Inst.
Proposed Date of Field Activities: 10/9/89

Background Info: Complete: [X] Preliminary (No analytical data available) [ ]

Documentation/Summary:

Overall Chemical Hazard:	Serious [ ] Low [X]	Moderate [ ] Unknown [ ]
Overall Physical Hazard	Serious [ ] Low [X]	Moderate [ ] Unknown [ ]

B. SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [ ]	Solid [X]	Sludge [ ]	Gas/Vapor [ ]

Characteristic(s):

Flammable/ Ignitable [ ]	Volatile [X]	Corrosive [ ]	Acutely Toxic [X]
Explosive [ ]	Reactive [ ]	Carcinogen [ ]	Radioactive* [ ]

Other:

Physical Hazards:

Overhead [X]	Confined* Space [ ]	Below Grade [ ]	Trip/Fall [X]
Puncture [ ]	Burn [ ]	Cut [ ]	Splash [ ]
Noise [X]	Other: Automobile Traffic		

*Requires completion of additional form and special approval from the Corporate Health/Safety group. Contact RSC or HQ.

Site History/Description and Unusual Features (see Sampling Plan for detailed description): Alleged burial of broken concrete Reactor cells ~~in August~~ contaminated with mercury, in Aug. & Sept. 1958 by Olin Chemical

ocations of Chemicals/Wastes: Buried onsite

stimated Volume of Chemicals/Wastes: 23 Tons of Concrete

ite Currently in Operation Yes: [ ] No: [X]

- -

C. HAZARD EVALUATION

List Hazards by Task (i.e., drum sampling, drilling, etc.) and number them. (Task numbers are cross-referenced in Section D)

Ph ical Hazard Evaluation: TASK 1: Site Reconnaissance
TASK 2: Geophysical Survey
TASK 3: Surface Soil Sampling
TASK 4: Drilling & Monitoring Well Installation

Ch ical Hazard Evaluation:

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
Mercury	~~0.1~~ 0.05 mg/m^3	inhalation skin absorption	abdominal pain vomiting	—	—
Phthalates					
esticides					
*note That undisturbed liquid mercury will not be detected by instrumentation if it has been dormant for a period of time.					

Note: Complete and attach a Hazard Evaluation Sheet for major known contaminant.

- -

D. SITE SAFETY WORK PLAN

Site Control: Attach map, use back of this page, or sketch of site showing hot zone, contamination reduction, zone, etc.

Perimeter identified? [Y] Site secured? [N]

Work Areas Designated? [Y] Zone(s) of Contamination Identified? [N]

Personnel Protection (TLD badges required for all field personnel):

Anticipated Level of Protection (Cross-reference task numbers to Section C):

	A	B	C	D
Task 1			(X)	X
Task 2			(X)	X
Task 3			(X)	X
Task 4			(X)	X

(Expand if necessary)

Modifications: Level C available as backup. Mercury vapor can only be removed using special MSA MercSorb APR cartridges!

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates >_____ mg/m^3, other mercury >.025 mg/m^3
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapor (in breathing zone) >5 ppm, particulates >_____ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates >_____ mg/m^3, other ____________.
- Level A: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates >_____ mg/m^3, other ________.

Air Monitoring (daily calibration unless otherwise noted):

Contaminant of Interest	Type of Sample (area, personal)	Monitoring Equipment	Frequency of Sampling
Volatile Organics	Area	HNu	Continuous
Radiation	"	Mini-Rad	"
Mercury Vapor ~~[illegible]~~	"	Mercury Vapor Analyzer	"
* → operator must	be trained in use	, limitations and	field "burn off" procedures

(Expand if necessary)

Decontamination Solutions and Procedures for Equipment, Sampling Gear, etc.:

1) Scrub with brushes in trisodium phosphate sol'n
2) Rinse with deionized water
3) 10% Nitric acid rinse
4) Rinse with Hexane* } ~~require APR usage, gloves~~
5) Rinse with Acetone* } ~~may damage some equipment!~~
6) Triple Dionized water rinse

* Note: decon activities requiring solvent use necessitate wearing APR/GMC-~~H~~A-cartridge, as well as impermeable gloves.

*[illegible]

Personnel Decon Protocol: Following disposal of expendables, crew will wash hands/face ASAP with soap and water

Decon Solution Monitoring Procedures, if Applicable: NA

Special Site Equipment, Facilities, or Procedures (Sanitary Facilities and Lighting Must Meet 29 CFR 1910.120):

NA

Site Entry Procedures and Special Considerations: Notify ~~NYSDEC~~ appropriate NYSDEC and LOVE CANAL Representatives prior to entry. Park vehicles off main road (Colvin Blvd.)

Work Limitations (time of day, weather conditions, etc.) and Heat/Cold Stress Requirements:

Daylight, no working during thunderstorms

General Spill Control, if applicable: NA

Investigation-Derived Material Disposal (i.e., expendables, decon waste, cuttings): disposal according to work plan

Double-bagging of disposables, and ~~Then what??~~ NA

(~~If IDM and decon solutions are to remain on site, written permission necessary from client~~)

Sample Handling Procedures Including Protective Wear:

Rubber booties and gloves; Tyvek or cotton coveralls, and safety shoes. Surgical gloves for samples

Team Member*	Responsibility
G. Florentino	Team Leader
TBD	Site Safety Officer

*All entries into exclusion zone require Buddy System use. All E & E field staff participate in medical monitoring program and have completed applicable training per 29 CFR 1910.120. Respiratory protection program meets requirements of 29 CFR 1910.134, and ANSI Z88.2 (1980).

E. EMERGENCY INFORMATION

(Use supplemental sheets, if necessary)

LOCAL RESOURCES

(Obtain a local telephone book from your hotel, if possible)

Ambulance 911

Hospital Emergency Room Mt. St. Mary's Hospital 297-4800

Poison Control Center Niagara County 278-4511

Police (include local, county sheriff, state) Niagara County Sheriff 439-9393

Fire Department 911

Airport NA

Agency Contact (EPA, State, Local USCG, etc.) NYSDEC

Local Laboratory E+E Asc 4285 Genesee St

UPS/Fed. Express NA

Client/EPA Contact Gerald Rider NYSDEC (Albany) 518-457-0927

Site Contact Owners: W.D. Broderick - Love Canal Area Revitalation Agency
D. Weaver + V. French - United Methodist Church

SITE RESOURCES

Site Emergency Evacuation Alarm Method Blast Van Horn

Water Supply Source NA ~~for~~ decon ??

Telephone Location, Number NA

Cellular Phone, if available NA

Radio NA

Other NA

EMERGENCY CONTACTS

1. Dr. Raymond Harbison (Univ. of Florida) .... (501) 221-0465 or (904) 462-3277, 3281
   Alachua, Florida (501) 370-8263 (24 hours)

2. Ecology and Environment, Inc., Safety Director
   Paul Jonmaire .... (716) 684-8060 (office)
   (716) 655-1260 (home)

3. Regional Office Contact .... Same as above (home)
   ________ (office)

4. FITOM, TATOM, or Office Manager .... NA (home)

MEDTOX HOTLINE

Twenty-four hour answering service: (501) 370-8263

What to report:

- State: "this is an emergency."
- Your name, region, and site.
- Telephone number to reach you.
- Your location.
- Name of person injured or exposed.
- Nature of emergency.
- Action taken.

A toxicologist, (Drs. Raymond Harbison or associate) will contact you. Repeat the information given to the answering service.

If a toxicologist does not return your call within 15 minutes, call the following persons in order until contact is made:

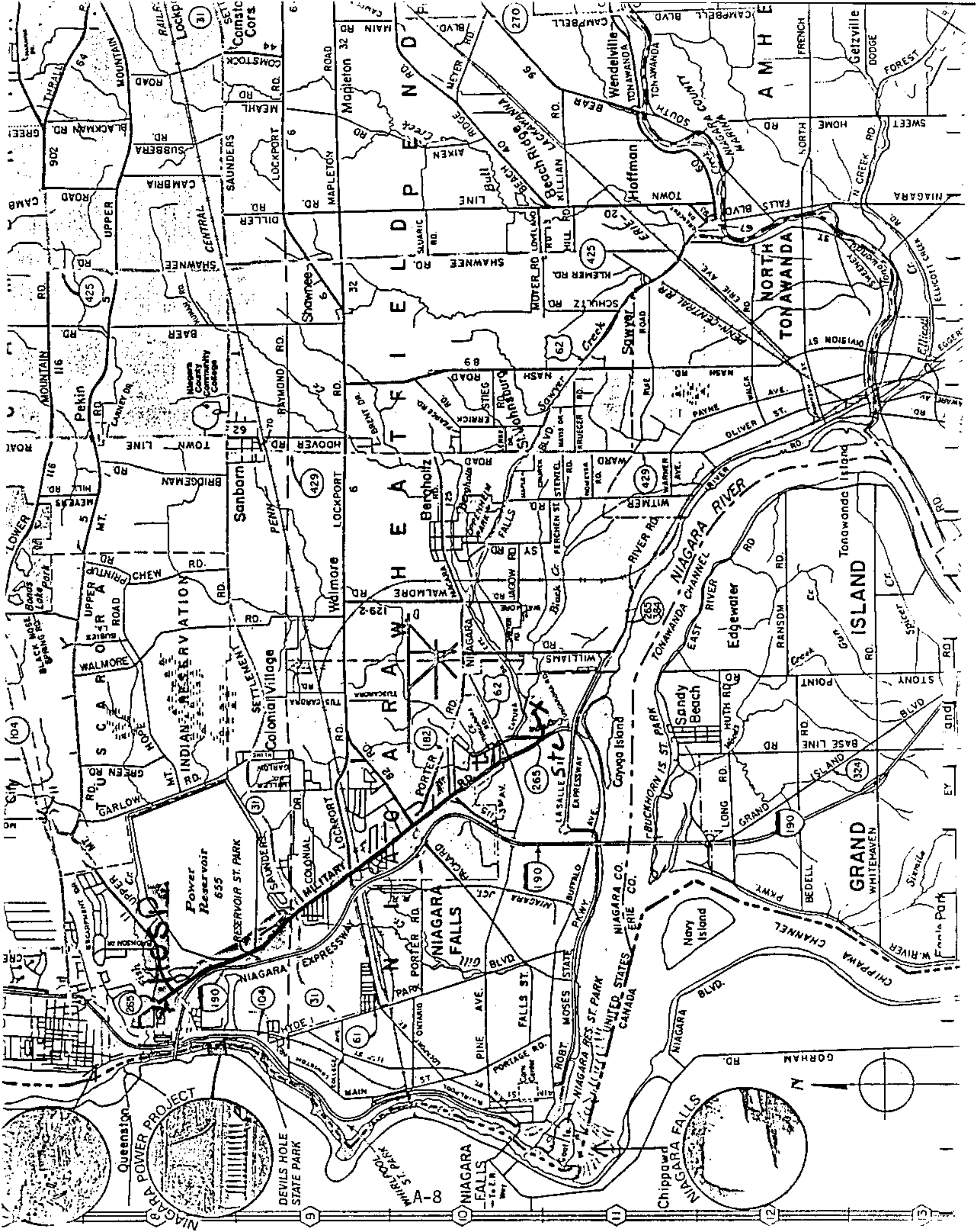
a. **24 hour hotline - (716) 684-8940**
b. Corporate Safety Director - Paul Jonmaire - home # (716) 655-1260
c. Assistant Corp. Safety Officer - Steven Sherman - home # (716) 688-0084

EMERGENCY ROUTES

(NOTE: Field Team must Know Route(s) Prior to Start of Work)

Directions to hospital (include map) Mt. St. Mary's Hospital: 5300 Military Rd, Lewiston
olvm Blvd west to end, Left on Pasadena Ave, 2 blks to Lindbergh Ave,
Right on Lindbergh, 2 blks to Military Rd (Rt 265), turn right, go
5 ~~veral~~ miles north. After passing Upper Mt. Road, hospital is on
left side.

ergency Egress Routes to Get Off-Site


NIAGARA FALLS
NORTH TONAWANDA
GRAND ISLAND
NIAGARA RIVER
TONAWANDA CHANNEL
CHIPPAWA CHANNEL
Power Reservoir
TUSCARORA INDIAN RESERVATION
WHEATFIELD
LEWISTON
Sanborn
Pekin
Walmore
Bergholtz
St. Johnsburg
Shawnee
Mapleton
Wendelville
Hoffman
Beach Ridge
Colonial Village
Sandy Beach
Edgewater
Cayuga Island
Navy Island
Queenston
Chippawa
Site
NIAGARA POWER PROJECT
DEVILS HOLE STATE PARK
WHIRLPOOL ST. PARK
NIAGARA RES. ST. PARK
RESERVOIR ST. PARK
BUCKHORN IS. ST. PARK
NIAGARA CO.
ERIE CO.
UNITED STATES
CANADA
Niagara County Community College
NIAGARA EXPRESSWAY
LA SALLE EXPRESSWAY
MILITARY RD.
ROBT. MOSES STATE PKWY.

F. EQUIPMENT CHECKLIST

PROTECTIVE GEAR

Level A	No.	Level B	No.
SCBA		SCBA	
SPARE AIR TANKS		SPARE AIR TANKS	
ENCAPSULATING SUIT (Type ____________)		PROTECTIVE COVERALL (Type ____________)	
SURGICAL GLOVES		RAIN SUIT	
NEOPRENE SAFETY BOOTS		BUTYL APRON	
BOOTIES		SURGICAL GLOVES	
GLOVES (Type ____________)		GLOVES (Type ____________)	
OUTER WORK GLOVES		OUTER WORK GLOVES	
HARD HAT		NEOPRENE SAFETY BOOTS	
CASCADE SYSTEM		BOOTIES	
5-MINUTE ESCAPE COOLING VEST		HARD HAT WITH FACE SHIELD	
		CASCADE SYSTEM	
		MANIFOLD SYSTEM	
Level C		**Level D**	
ULTRA-TWIN RESPIRATOR	X	ULTRA-TWIN RESPIRATOR (Available)	X
POWER AIR PURIFYING RESPIRATOR		CARTRIDGES (Type GMC-H/Mersorb)	X
CARTRIDGES (Type GMC-H/Mersorb)	X	5-MINUTE ESCAPE MASK (Available)	
5-MINUTE ESCAPE MASK		PROTECTIVE COVERALL (Type Tyvek)	X
PROTECTIVE COVERALL (Type Tyvek)	X	RAIN SUIT	X
RAIN SUIT	X	NEOPRENE SAFETY BONDS	
BUTYL APRON		BOOTIES	X
SURGICAL GLOVES	X	WORK GLOVES	X
GLOVES (Type ____________)		HARD HAT WITH FACE SHIELD	
OUTER WORK GLOVES		SAFETY GLASSES	
NEOPRENE SAFETY BOOTS			
HARD HAT WITH FACE SHIELD			
BOOTIES	X		
HARDHAT			

INSTRUMENTATION	No.	DECON EQUIPMENT	No.
OVA		WASH TUBS	X
THERMAL DESORBER		BUCKETS	
O2/EXPLOSIMETER W/CAL. KIT		SCRUB BRUSHES	X
PHOTOVAC TIP		PRESSURIZED SPRAYER	X
HNu (Probe 10.2 eV)	X	DETERGENT (Type TSP)	X
MAGNETOMETER		SOLVENT (Type Acetone/Hexane)	X
PIPE LOCATOR		PLASTIC SHEETING	X
WEATHER STATION		TARPS AND POLES	
DRAEGER PUMP, TUBES ______		TRASH BAGS	X
BRUNTON COMPASS	X	TRASH CANS	
MONITOX CYANIDE		MASKING TAPE	
HEAT STRESS MONITOR		DUCT TAPE	X
NOISE EQUIPMENT ______		PAPER TOWELS	X
PERSONAL SAMPLING PUMPS		FACE MASK	
Mercury Vapor Analyzer	X	FACE MASK SANITIZER	
		FOLDING CHAIRS	
		STEP LADDERS	
RADIATION EQUIPMENT		DISTILLED WATER	X
DOCUMENTATION FORMS		10% Nitric Acid	X
PORTABLE RATEMETER			
SCALER/RATEMETER		**SAMPLING EQUIPMENT**	
NaI Probe		8 OZ. BOTTLES	X
ZnS Probe		HALF-GALLON BOTTLES	
GM Pancake Probe		VOA BOTTLES	
GM Side Window Probe		STRING	
MICRO R METER		HAND BAILERS	
ION CHAMBER		THIEVING RODS WITH BULBS	
ALERT DOSIMETER		SPOONS	X
POCKET DOSIMETER		KNIVES	
Mini-RAD	X	FILTER PAPER	
FIRST AID EQUIPMENT		PERSONAL SAMPLING PUMP SUPPLIES	
FIRST AID KIT	X		
OXYGEN ADMINISTRATOR			
STRETCHER			
PORTABLE EYE WASH	X		
BLOOD PRESSURE MONITOR			
FIRE EXTINGUISHER			

VAN EQUIPMENT	No.
TOOL KIT	X
HYDRAULIC JACK	
LUG WRENCH	
TOW CHAIN	
VAN CHECK OUT	
Gas	
Oil	
Antifreeze	
Battery	
Windshield Wash	
Tire Pressure	
MISCELLANEOUS	
PITCHER PUMP	
SURVEYOR'S TAPE	X
100 FIBERGLASS TAPE	
300 NYLON ROPE	
NYLON STRING	
SURVEYING FLAGS	X
FILM	X
WHEEL BARROW	
BUNG WRENCH	
SOIL AUGER	
PICK	
SHOVEL	
CATALYTIC HEATER	
PROPANE GAS	
BANNER TAPE	
SURVEYING METER STICK	
CHAINING PINS & RING	
TABLES	
WEATHER RADIO	
BINOCULARS	
MAGAPHONE	

MISCELLANEOUS (Cont.)	No.
SHIPPING EQUIPMENT	
COOLERS	X
PAINT CANS WITH LIDS, 7 CLIPS EACH	
VERMICULITE	
SHIPPING LABELS	
DOT LABELS: "DANGER"	
"UP"	
"INSIDE CONTAINER COMPLIES ..."	
"HAZARD GROUP"	
STRAPPING TAPE	
BOTTLE LABELS	X
BAGGIES	X
CUSTODY SEALS	X
CHAIN-OF-CUSTODY FORMS	X
FEDERAL EXPRESS FORMS	
CLEAR PACKING TAPE	

ecology and environment, inc.

HAZARD EVALUATION OF CHEMICALS 3 1989

Chemical Name Mercury

Date Oct. 6, ~~1986~~

DOT Name/U.N. No. 2809

Job No. ~~NF-5040~~ YN-7020/7030/706

CAS Number 7439-97-6

References Consulted (circle):

NIOSH/OSHA Pocket Guide   Verschueren   Merck Index   Hazardline   Chris (Vol. II)

Toxic and Hazardous Safety Manual   ACGIH   Other: Codes of Fed. Reg.

NA2809, Colloidal mercury, NCIC 60399, OH5 14020

Chemical Properties: (Synonyms: metallic mercury, inorganic mercury, quicksilver

Chemical Formula Hg   Molecular Weight 201

Physical State Silvery-white heavy, mobile liquid metal   Solubility (H_2O) insol, 1g/100 @20°C   Boiling Point 674°

Flash Point ~~non-flam~~   Vapor Pressure/Density .0012@20°C   Freezing Point -38°

Specific Gravity 13.5939   Odor/Odor Threshold ______   Flammable Limits ______

Incompatabilities acetylene gas, ammonia

Biological Properties:

TLV-TWA 0.05 mg/m^3 NIOSH PEL 0.1. mg/m^3 Odor Characteristic ______

IDLH 28 mg/m^3 Human ______   Aquatic ______   Rat/Mouse ______

Route of Exposure inhalation, skin eye contact, skin absorption

Carcinogen indef. in animals   Teratogen ______   Mutagen ______

Handling Recommendations: (Personal protective measures)

~~Prevent skin contac; wear~~ impervious clothing, gloves, faceshield, and goggles to prevent eye contact

Monitoring Recommendations:

Adsorption tube; thermal desopr; atomic absorption spectrometry

Disposal/Waste Treatment:

RCRA HW D009 max. conc. 0.2. mg/l

~~check with local POTW for low conc.~~

Health Hazards and First Aid:

~~Primary skin irritant and sensitizer, nephrotoxix, and neurotoxin~~

wash from skin and eyes promptly if contaminated

Symptoms: Acute: metallic taste, thirst, abdominal pain, vomiting, and bloody diarrhea. Inhalation--dyspnea, cough, stomatitis, salivation

Chronic: pulmonary disturbances, anuria, skin disorders, anemia ~~leukopenia, liver damage, loosening of teeth, peripherial~~

peripherial neuropathy weight loss, and nephritis

375103

(12/83,DLD)

DRILLING SITE SAFETY CHECKLIST

- All E&E drilling personnel will have read and understood the terms of E&E drilling SOP.

- Daily inspection of rig and components - obvious or questionable safety conditions will be cause for work interruption.

- Only approved drillers will remain in proximity to borehole during drilling and in any event, an approximate 4' x 8' <u>super</u> exclusion area will be in place around moving auger. No personnel will enter this zone while drilling is ongoing.

- Continuous O_2/explosimeter monitoring at borehole using remote sampling hose.

- All field team members will be briefed on planned drilling operations and possible problems before work commences on day one. All will be shown location and operation of "kill switches". These switches will be operationally checked each morning.

- Fire extinguisher(s) will be staged next to rig before drilling/refueling operations.

- Welding/cutting activities will only be performed at a distance from ignition sources approved as safe by the Site Safety Officer (SSO), Team Leader.

- Appropriate personnel protective equipment (based on hazards associated with assumed well contaminants) will be worn as directed by the SSO and terms of the site safety plan. As a <u>minimum</u>, steel-toed boots, hard-hats, and face shields will be worn during any active drilling.

- Outrigger stabilizers must be in place before drilling commences. The rig must also be leveled.

- Drill rig boom must be horizontal during movement of rig. It will not be erected within 25 feet of overhead lines.

- Electrical storms within earshot of the job site will be cause for work termination until deemed safe by the SSO and Team Leader.

- Where underground utilities are suspected in a vacinity of operations, the local utilities shall be contacted. Where utilities are identified, they shall be marked using flags.

- Where buried drums, etc. are suspected, a full survey of drilling zone is required using appropriate instrumentation prior to ground breaking.

DRILLING SITE SAFETY CHECKLIST continued:

- o Only trained, experienced staff will operate the cathead. Personnel must be knowledgeable in safe good practive procedures for cathead use.
- o Only properly licensed staff will drive the drill rig. A daily safety check of the vehicle will be carried out by the driver, per E&E protocol.
- o Climbing on vertical boom is not permitted by E&E staff.

APPENDIX B

GEOPHYSICAL SURVEY

YO-7030 D2712

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATIONS

GEOPHYSICAL SURVEY
97th Street Methodist Church, Site Number 932084A
City of Niagara Falls, Niagara County

December 1989

Prepared for:

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001
Thomas C. Jorling, Commissioner

Division of Hazardous Waste Remediation
Michael J. O'Toole, Jr., P.E., Director

Prepared by:

Ecology and Environment Engineering, P.C.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

This geophysical investigation report for the 97th Street Methodist Church site (I.D. No. 9-32-084A) on Colvin Boulevard in Niagara Falls, New York, was prepared by Ecology and Environment Engineering, P.C. (E & E) and their subcontractor Hager-Richter Geoscience, Inc. (H-R), under contract to the New York State Department of Environmental Conservation (NYSDEC). The fieldwork was performed by the subcontractor (H-R) under the supervision of E & E. The geophysical investigation consisted of a shallow seismic refraction survey and a ground penetrating radar (GPR) survey. This report includes Seismic Refraction Data (Appendix B-1), Seismic Refraction Profiles (Appendix B-2), and GPR Profiles (Appendix B-3) for the geophysical survey performed at this site on October 24 and 25, 1989, as part of the Phase II Investigation. Additionally, interpretations of the data generated, along with conclusions, are provided in this report.

2. OBJECTIVES

The geophysical survey program at the 97th Street Methodist Church site was designed to achieve several general goals. The main objectives of the geophysical methods used were to optimize the locations of the four proposed groundwater monitoring wells; reduce the risks associated with drilling into unknown terrain and suspected fill material; reduce overall project time and cost; improve the accuracy and confidence of the investigation; identify the existence and boundaries of buried waste (i.e., concrete reactor cells); and characterize the subsurface conditions (i.e., thickness of beds, depth to bedrock, etc.)

3. METHODS

3.1 SEISMIC REFRACTION

An EG&G Model ES1225 Multiple Channel Signal Enhancement Seismograph, a 220-foot spread cable, and 12 vertical geophones were used for the seismic refraction survey. The spacing between geophones was 20 feet.

The ES1225 is a microprocessor controlled instrument that allows seismic signals from several successive shots to be accumulated, or "stacked," and added selectively to the 12 channels in order to increase the signal-to-noise ratio. The field data were recorded both on permanent paper seismograms and on digital cassette by a portable digital recorder.

Six shots (or "drops") were made for each geophone spread. Energy for the shots was provided by a 10 pound sledgehammer hitting a steel baseplate. The seismograph recorded data for 100 milliseconds after each shot. Shots were made at both ends of the cable, 80 feet offset from each end of the cable, and at locations 60 feet and 160 feet along the spread cable. The purpose of six shots along a given spread is to provide reversed refraction profiles and data redundancy, both of which are necessary to obtain accurate depths.

Data were obtained along five lines of profile, four lines along the boundaries and one across the middle of the site. The locations of all seismic survey lines were selected in the field by the E & E site representative. The locations of the seismic refraction lines are shown in Figure 3-1.

The seismic data were analyzed using the Generalized Reciprocal Method (GRM) of seismic refraction interpretation for the intermediate and bedrock layers and the crossover distance method for the shallow

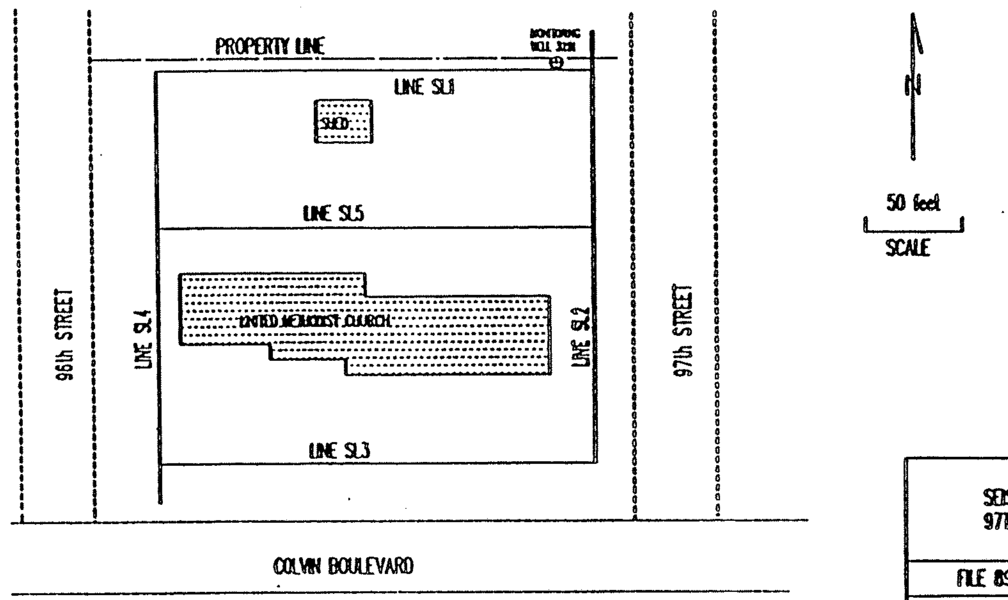


Figure 3-1
SEISMIC REFRACTION LINE LOCATIONS
97TH STREET METHODIST CHURCH SITE
NIAGARA FALLS, NY

FILE 89041	OCTOBER 1989

HAGER-RICHTER GEOSCIENCE, INC.
8 Industrial Way, D10
Salem, NH 03079

layer. The GRM has several advantages over other seismic refraction interpretation methods such as the crossover-distance method. The GRM allows for some variation in the surface topography as well as lateral variation in the seismic velocity of the upper layers. The method uses a principle of migration whereby the refractor need only be planar over a short distance, thus allowing the calculation of depth to an undulating interface. In addition, the GRM method is relatively insensitive to dip angles as high as 20°, unlike most other methods which can be sensitive to dips as low as 5°. The GRM also allows for the calculation of depth below each geophone instead of below only the shot points as in the time-intercept and crossover-distance methods.

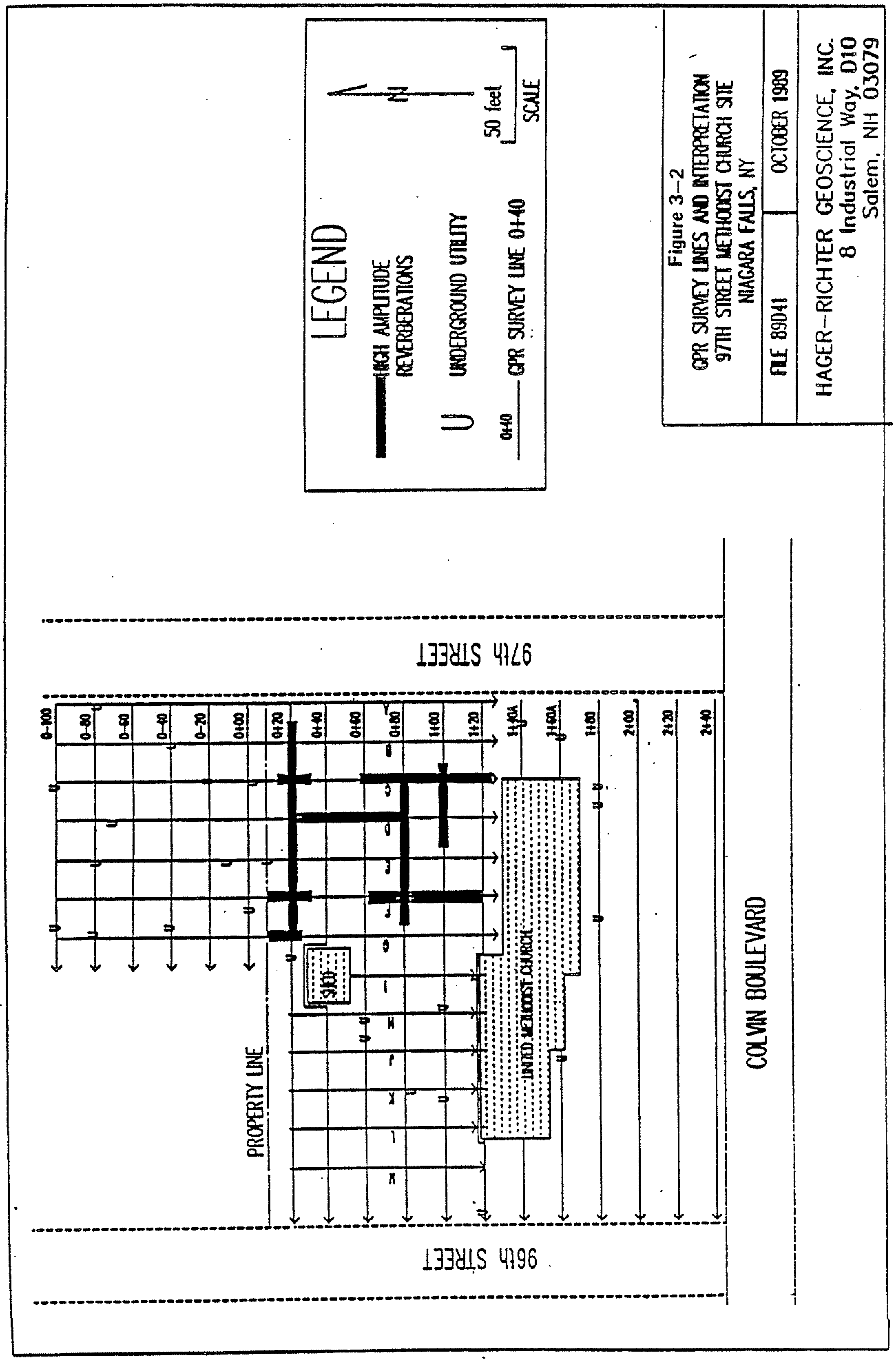
The seismic refraction method assumes that velocity increases with depth and does not completely account for a lower velocity material underlying a higher velocity material, a common situation in stratified sediments. If present, the lower velocity layers cause an error in the thickness calculated for any layers beneath them. The uncertainty in depth estimates due to this and other causes may be as much as 15%.

3.2 GROUND PENETRATING RADAR

GPR is similar to other radar systems (for example, weather radar) in that it transmits electromagnetic signals and then detects, amplifies, and displays reflections of the signals. The reflections are produced by spatial changes in the electrical properties (complex dielectric constant) of the materials in the path of the signals. For GPR, changes in electrical conductivity, permittivity, density, and/or rock or sediment type can produce reflections of the radar signal that result in images of the subsurface.

A Geophysical Survey Systems, Inc., Model SIR-3 ground penetrating radar system was used for this investigation. The unit consists of an electronics unit, power supply, graphic recorder, and a transmitting/receiving antenna. The transmit/receive GPR antenna is housed in a box that is moved across the surface. The transmitted signal is directed into the ground and the reflected signals received by the antenna are output on a graphic recorder. The horizontal axis of the graphic record is the ground surface. The vertical axis is calibrated in round-trip travel time of the radar signal in nanoseconds. The travel times can be converted to estimated depth if the composition of the subsurface is known from either correlation with borehole logs or by other means. For those sites where the subsurface is electrically inhomogeneous, the travel times of the radar signal will be different in the various materials and the vertical scale for the radar records may not necessarily be uniform with depth.

The GPR survey was conducted using a 300 MHz antenna which has a maximum depth of penetration of 25 to 30 feet under optimal subsurface conditions. The instrument settings were adjusted to provide maximum resolution in the 0- to 15-foot depth range. Figure 3-2 is a sketch map showing the locations of the GPR profiling lines. GPR data were obtained along lines spaced 20 feet apart running from east to west across the site. Because it was thought that the reactor cells were likely to have been buried on the northern half of the site and the adjacent lawn, GPR data were also acquired along lines spaced 20 feet apart and running from north to south in these areas. GPR data were acquired along 31 lines totaling 5,155 linear feet.


LEGEND
HIGH AMPLITUDE REVERBERATIONS
U UNDERGROUND UTILITY
0+40 GPR SURVEY LINE 0+40
50 feet
SCALE
N
97th STREET
96th STREET
COLVIN BOULEVARD
PROPERTY LINE
UNITED METHODIST CHURCH
SHED
0-100
0-80
0-60
0-40
0-20
0+00
0+20
0+40
0+60
0+80
1+00
1+20
1+40A
1+60A
1+80
2+00
2+20
2+40
Figure 3-2
GPR SURVEY LINES AND INTERPRETATION
97TH STREET METHODIST CHURCH SITE
NIAGARA FALLS, NY
FILE 89041
OCTOBER 1989
HAGER-RICHTER GEOSCIENCE, INC.
8 Industrial Way, D10
Salem, NH 03079

4. DATA INTERPRETATION

4.1 SEISMIC REFRACTION SURVEY

Figures B-1 to B-5 in Appendix B-2 are interpreted depth profiles for each seismic line. The profiles are shown as depth below surface because elevations for the seismic lines were not surveyed and the total elevation change over the site was less than 2 feet. The locations of intersecting seismic lines and the velocity range exhibited by each layer are also indicated in the profiles. Three layers were identified in the seismic data for the site: an upper layer of 4-8 feet deep with a velocity range of 1,100 to 1,500 feet per second, a middle layer which extends to depths of between 28 to 40 feet and has a velocity range of 5,100 to 5,400 feet per second, and a high velocity layer with a velocity range of 18,900 to 20,400 feet per second. By correlation with the log provided by NYSDEC for existing well 3251 in the northeast corner of the site, it appears that the upper layer is unsaturated fill or sediments, the middle layer is saturated clay and till layers, and the deeper layer is Lockport dolomite. The bedrock surface is 5 to 10 feet deeper in the northern part of the site than in the southern part.

4.2 GROUND PENETRATING RADAR SURVEY

The depth to which the transmitted GPR signal penetrates is dependent upon the electrical properties of the underlying materials. Clay-rich sediments are conductive and inhibit penetration of the GPR signal to layers below. This is apparently the case at the 97th Street Methodist Church site, where the upper few feet are probably clay-rich fill or sediments and the maximum depth of signal penetration is approximately 25 nanoseconds for the site. Using an average time-to-depth conversion factor of 5 nanoseconds per foot, we obtain a maximum depth of penetration of about 5 feet below the surface. This is illustrated on the left side of Figure C-1 (Appendix B-3) where we observe no signal below about 25 nanoseconds. Thus, any cement reactors with tops buried deeper than about 5 feet would not be detected.

One might expect that broken concrete reactor cells would have electrical properties very different from the ground in which they are buried. If the reactor cells are reinforced concrete, we expect that they would produce strong reverberating reflections of the radar signal, similar to the reverberations observed when crossing the GPR over the concrete sidewalks at the site. If the reactor cells were broken or crushed, we would expect the reverberations to be somewhat jumbled or distorted. There are a few GPR records of the asphalt parking area that have strong high amplitude reverberations generated from objects near the surface. An example of the reverberations is shown in the right side of Figure 3-1 (Appendix B-3) and the lines along which they are found are shown in Figure 3-2. It is possible, but unlikely, that these reverberations are caused by reinforced concrete reactor cells whose tops are buried less than 5 feet deep. Because of the flat, undistorted nature of the reverberations, it is more likely that they are caused by concrete slabs or sidewalks underlying the asphalt. Trenching these few areas would determine the origin of the reverberations.

Underground utilities generate characteristic tight hyperbolas (see Figure C-2). Potential locations at the 97th Street Methodist Church Site of underground utility lines identified in the GPR data are shown in Figure 3-2.

5. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the surface geophysical surveys conducted by Hager-Richter Geoscience, Inc., at the 97th Street Methodist Church site in October 1989, the following is concluded:

1. Three distinct velocity layers are present at the site: (1) a low velocity layer interpreted to be unsaturated fill or sediments roughly 4 to 8 feet thick, (2) an intermediate velocity layer interpreted to be saturated clays and tills roughly 20 to 35 feet thick, and (3) a high velocity bedrock, of Lockport Dolomite, at a depth ranging from 27 to 40 feet.

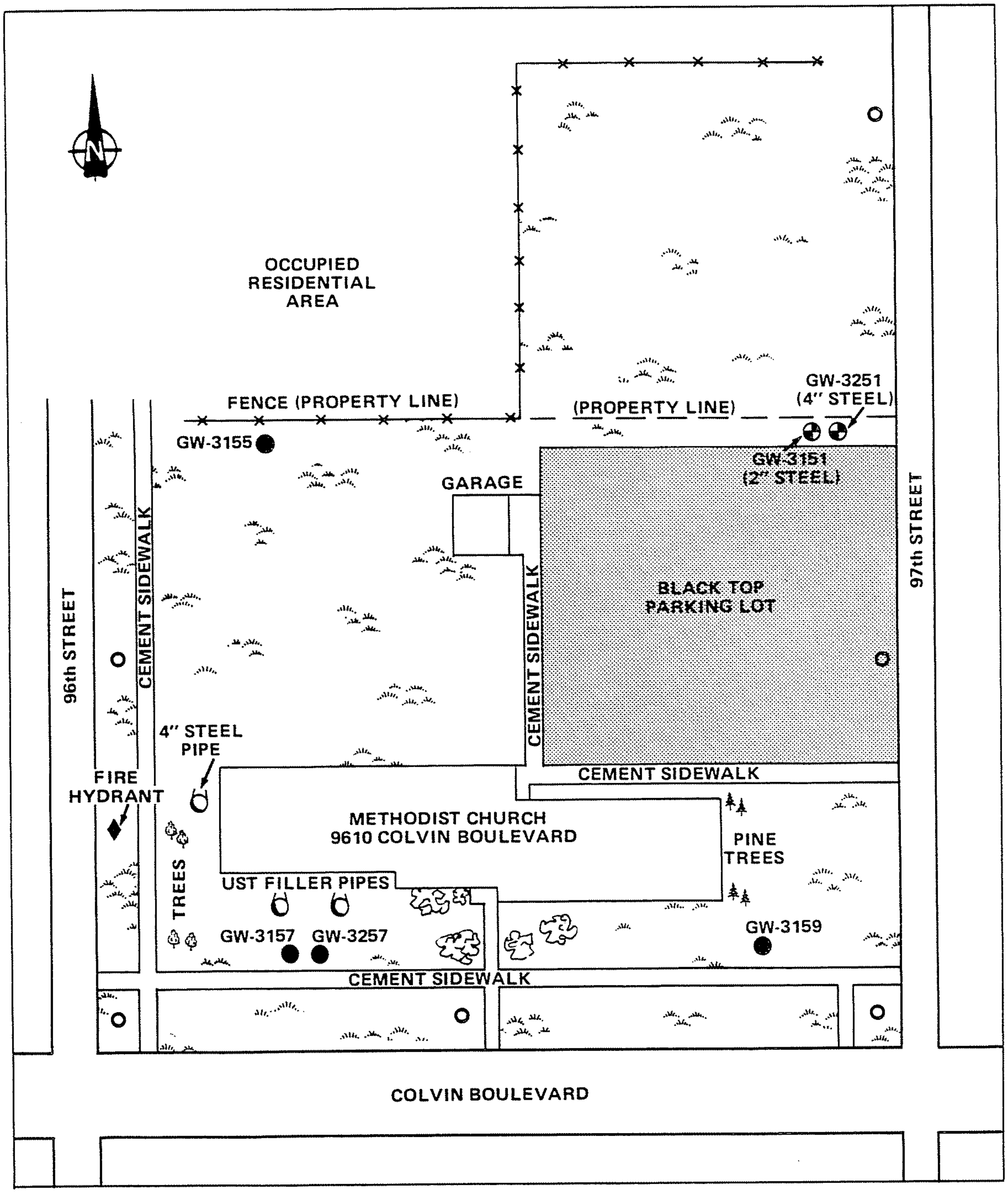
2. The bedrock surface is 5 to 10 feet deeper in the northern part of the site than in the southern part.

3. High amplitude reverberations recorded in a few GPR records of the asphalt parking area are possibly caused by reinforced concrete reactor cells. However it is more likely that they are caused by concrete slabs or sidewalks underlying the asphalt. No other anomalies are evident in the radar records for the rest of the site, indicating that there are no concrete reactor cells buried in the top 4 to 6 feet beneath the surface for those areas.

4. Several possible utility lines at the site are identified in Figure 3-2.

E & E recommends that a test pit(s) be dug in the vicinity of the GPR reverberations beneath the asphalt parking lot in order to determine whether they were caused by the presence of reactor cells, or concrete slabs and/or sidewalks.

The results of this survey indicate that the placement of the four monitoring wells as suggested in the work plan can be completed without impacting any buried objects (see Figure 5-1).



APPROXIMATE SCALE

0 20 40 80 120 FEET

KEY:

- Existing Wells
- Proposed Wells
- Utility Pole
- Grass
- Shrubs

Figure 5–1

SITE PLAN AND PROPOSED GROUNDWATER MONITORING WELL LOCATIONS, 97th STREET METHODIST CHURCH SITE, NIAGARA FALLS, N.Y.

Prior to drilling, the underground-utility locating service will be contacted to indicate possible public utilities buried in the vicinity of each of the drill sites. All proposed well locations will be confirmed with a NYSDEC representative prior to the commencement of drilling.

APPENDIX B-1

SEISMIC REFRACTION DATA

Table 1-1

SEISMIC REFRACTION RESULTS

Layer 1		Layer 2		Layer 3	
Location	Velocity[1]	Depth[2]	Velocity	Depth	Velocity
Line SL1					
0+00	1300	6	5300	39	19200
0+20	1300	6	5300	40	19200
0+40	1300	6	5300	38	19200
0+60	1300	5	5300	39	19200
0+80	1300	5	5300	39	19200
1+00	1300	5	5300	40	19200
1+20	1200	5	5200	38	18900
1+40	1200	5	5200	38	18900
1+60	1200	5	5200	37	19000
1+80	1200	5	5200	35	19200
2+00	1200	5	5100	35	19400
2+20	1300	5	5100	35	19400
Line SL2					
0+00	1400	6	5200	37	19000
0+20	1400	6	5200	37	19000
0+40	1300	6	5200	34	19000
0+60	1300	6	5200	31	19000
0+80	1300	6	5200	29	19000
1+00	1300	6	5200	30	19000
1+20	1300	5	5200	29	19000
1+40	1300	5	5200	30	19000
1+60	1200	5	5200	32	19000
1+80	1200	5	5200	31	19000
2+00	1300	5	5200	33	19000
2+20	1300	5	5200	35	19000
Line SL3					
0+00	1500	7	5400		
0+20	1400	8	5400		
0+40	1400	8	5400	31	19700
0+60	1300	8	5400	32	19700
0+80	1300	8	5300	32	19700
1+00	1300	7	5200	31	20400
1+20	1200	7	5100	32	20400
1+40	1200	6	5100	33	20200
1+60	1100	6	5000	32	20200
1+80	1100	6	5000	33	20200
2+00	1100	6	5000	34	19900
2+20	1100	6	5000		

[UZ]YO7030:D2712, #2151, PM=30

Table 1-1 (Cont.)

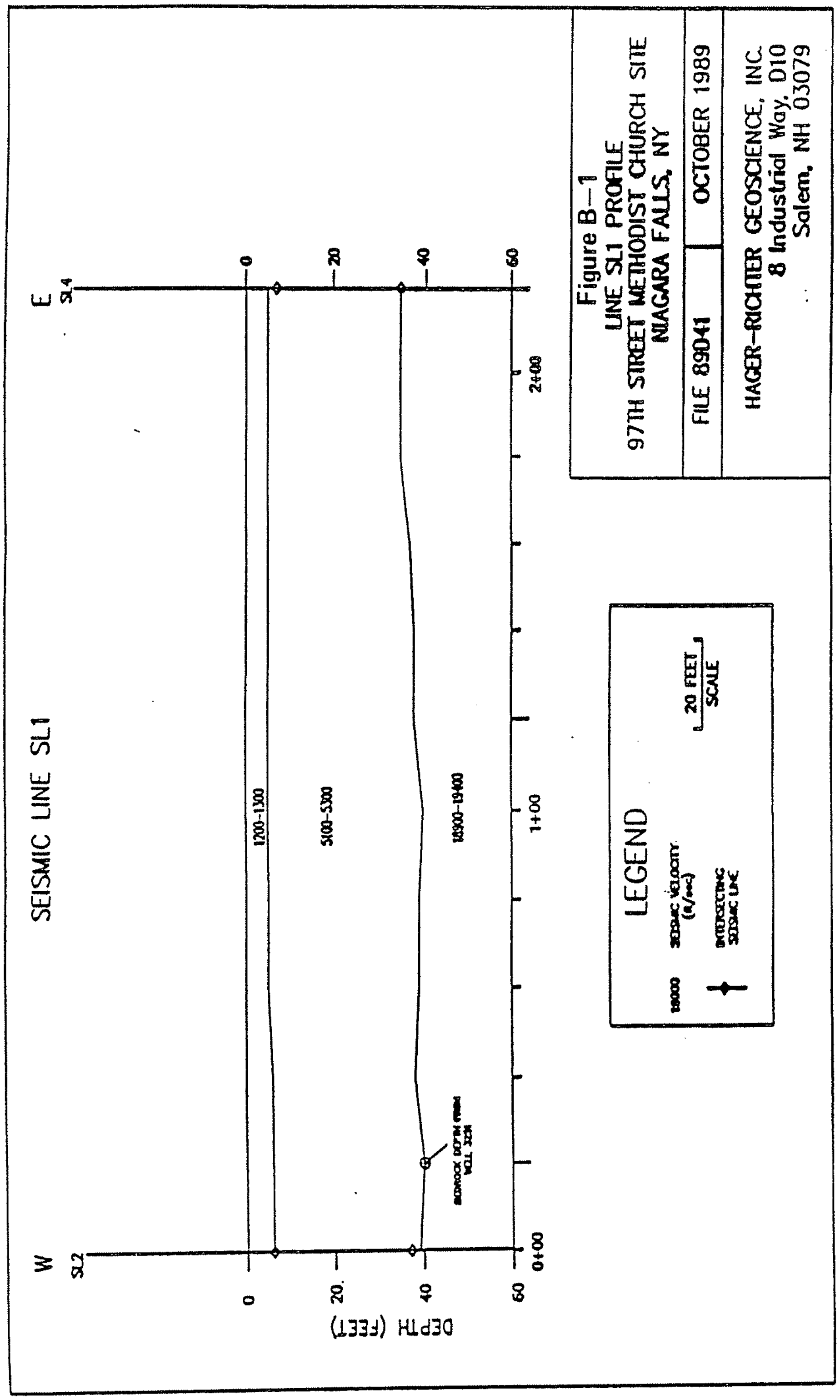
	Layer 1	Layer 2		Layer 3	
Location	Velocity[1]	Depth[2]	Velocity	Depth	Velocity
Line SL4					
0+00	1300	8	5200	28	19900
0+20	1300	9	5200	28	19900
0+40	1200	8	5200	27	19900
0+60	1100	7	5200	29	19900
0+80	1200	7	5200	28	19900
1+00	1200	7	5200	28	19900
1+20	1200	8	5200	28	19900
1+40	1200	8	5200	33	19900
1+60	1300	8	5200	33	19900
1+80	1200	8	5200	36	20200
2+00	1200	8	5200	35	20200
2+20	1200	8	5200	36	20200
Line SL5					
0+00	1300	6	5300	29	19000
0+20	1300	6	5300	28	19000
0+40	1300	7	5300	27	19000
0+60	1300	7	5300	29	19000
0+80	1300	6	5300	32	19000
1+00	1300	5	5300	34	19000
1+20	1300	5	5300	35	19000
1+40	1300	4	5300	36	19000
1+60	1300	3	5300	36	19000
1+80	1300	3	5300	34	19000
2+00	1300	3	5300	33	19000
2+20	1300	3	5300	32	19000

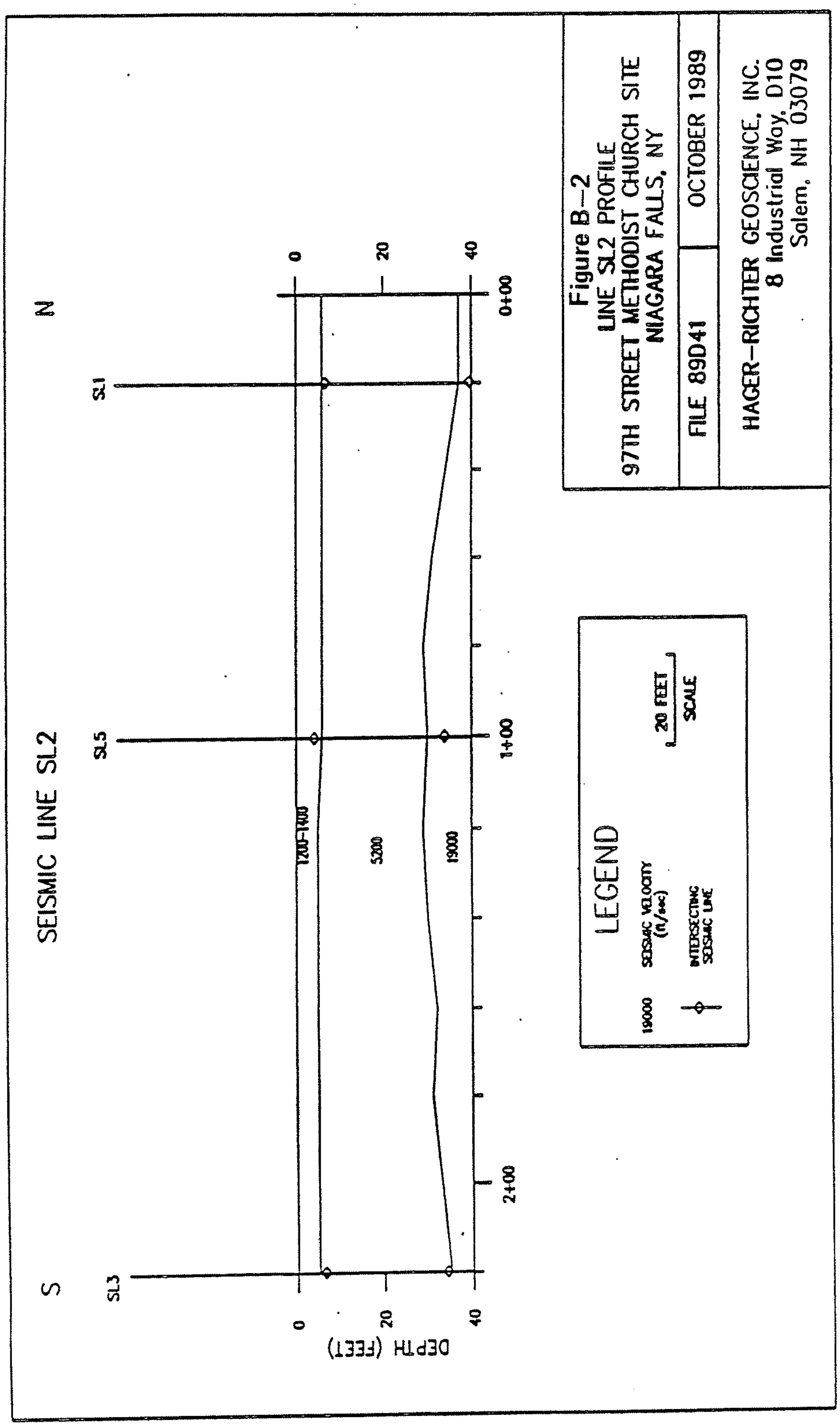
[UZ]YO7030:D2712, #2151, PM=30

Notes: [1]All velocities are in feet per second.
[2]All depths are in feet beneath the ground surface. Depth errors are as much as 15% of the total depth.

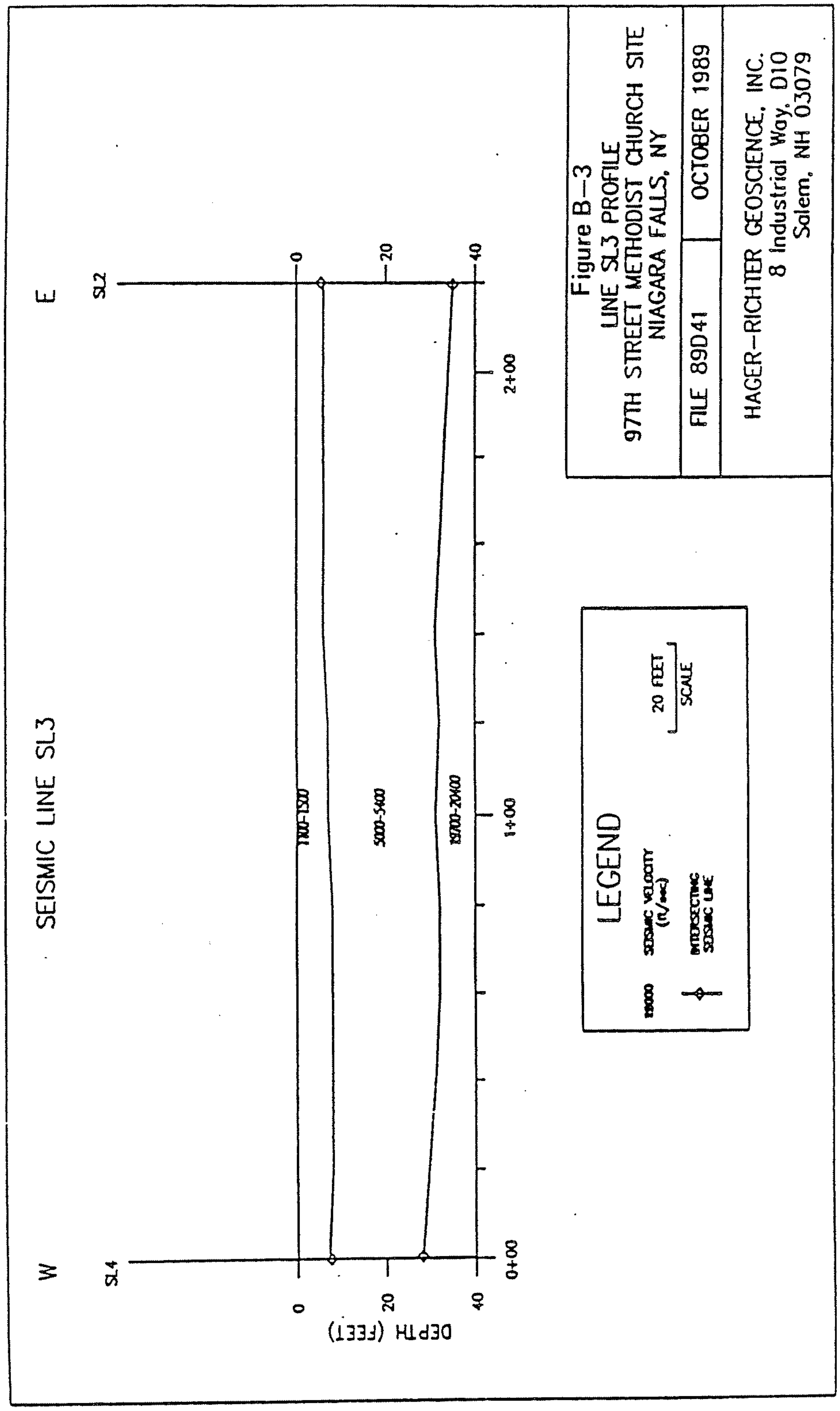
APPENDIX B-2

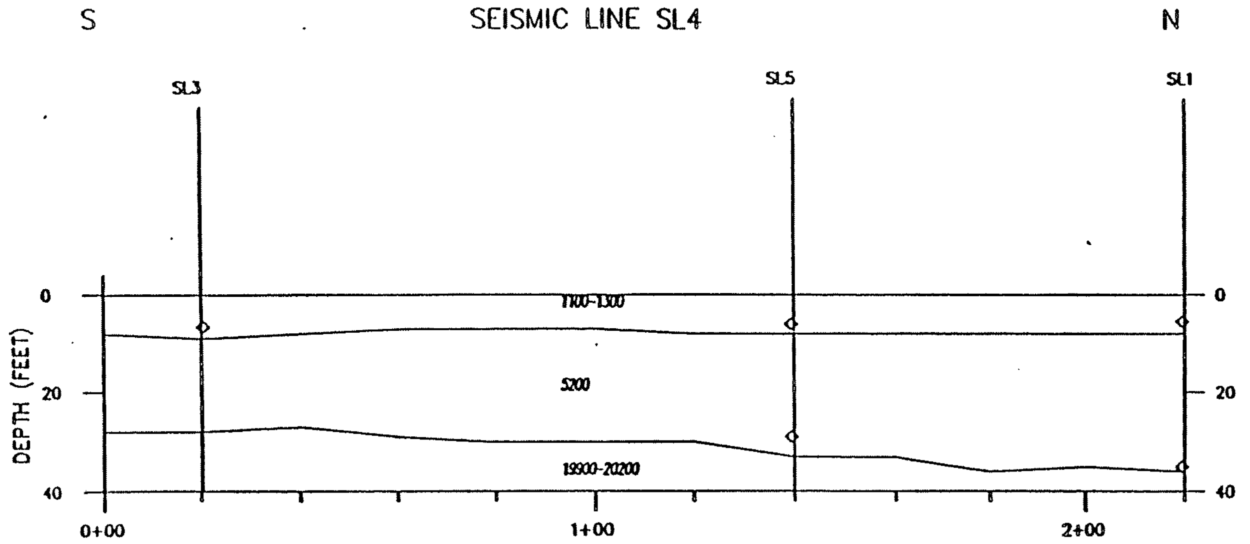
SEISMIC REFRACTION PROFILES


SEISMIC LINE SL1
W
E
SL2
SL4
DEPTH (FEET)
0
20
40
60
0+00
1+00
2+00
1200-1300
5100-5300
18300-19400
LEGEND
18000
SEISMIC VELOCITY (ft/sec)
INTERSECTING SEISMIC LINE
20 FEET
SCALE
Figure B—1
LINE SL1 PROFILE
97TH STREET METHODIST CHURCH SITE
NIAGARA FALLS, NY
FILE 89041
OCTOBER 1989
HAGER—RICHTER GEOSCIENCE, INC.
8 Industrial Way, D10
Salem, NH 03079



SEISMIC LINE SL2
S
N
SL3
SL5
SL1
DEPTH (FEET)
0
20
40
0+00
1+00
2+00
1200-1400
5200
19000
LEGEND
19000 SEISMIC VELOCITY (ft/sec)
INTERSECTING SEISMIC LINE
20 FEET
SCALE
Figure B-2
LINE SL2 PROFILE
97TH STREET METHODIST CHURCH SITE
NIAGARA FALLS, NY
FILE 89D41
OCTOBER 1989
HAGER-RICHTER GEOSCIENCE, INC.
8 Industrial Way, D10
Salem, NH 03079


SEISMIC LINE SL3
W
E
SL4
SL2
DEPTH (FEET)
0
20
40
0+00
1+00
2+00
1100-1500
5000-5400
19700-20400
LEGEND
SEISMIC VELOCITY (ft/sec)
INTERSECTING SEISMIC LINE
20 FEET
SCALE
Figure B-3
LINE SL3 PROFILE
97TH STREET METHODIST CHURCH SITE
NIAGARA FALLS, NY
FILE 89D41
OCTOBER 1989
HAGER-RICHTER GEOSCIENCE, INC.
8 Industrial Way, D10
Salem, NH 03079



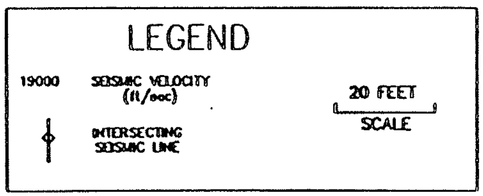
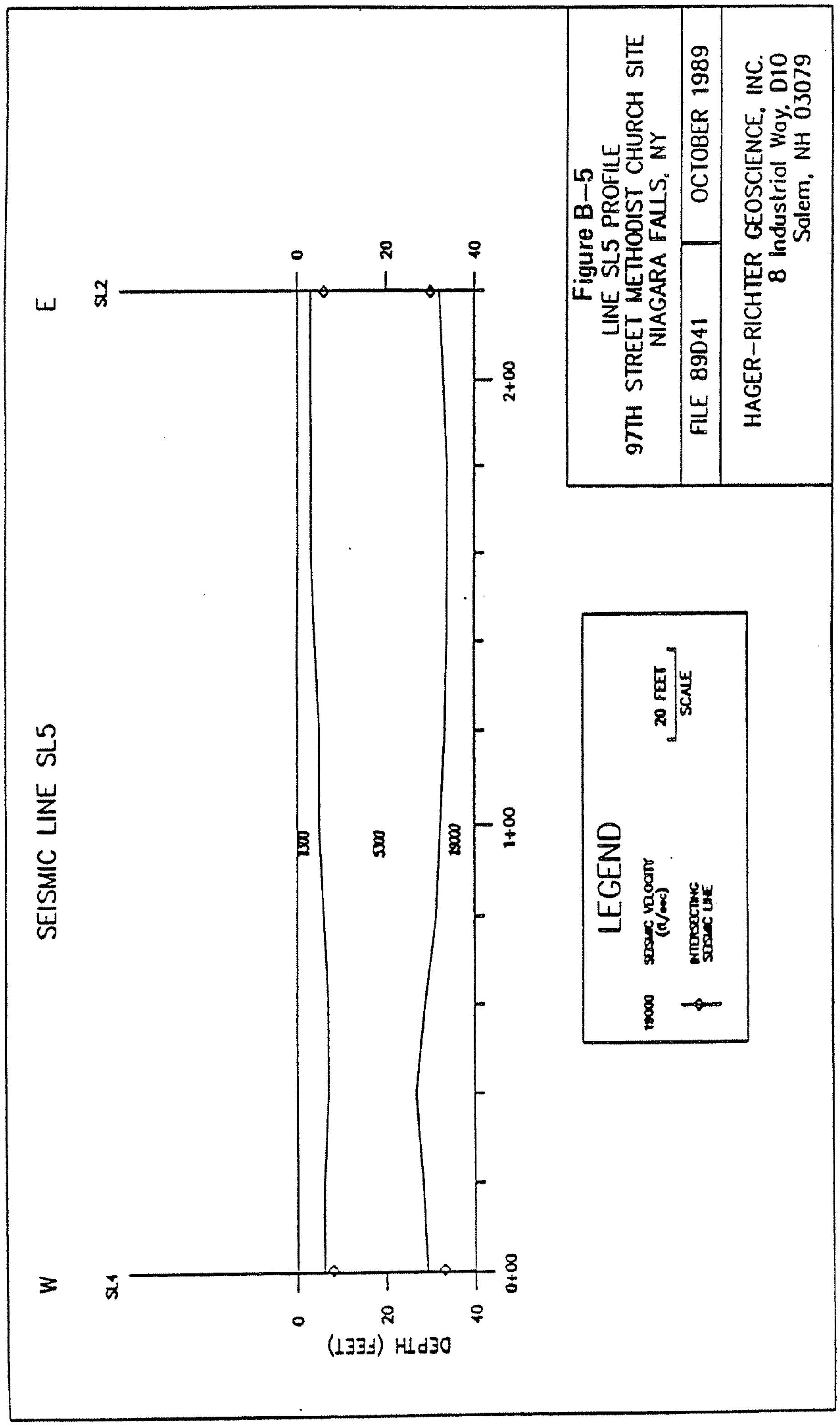


Figure B–4
LINE SL4 PROFILE
97TH STREET METHODIST CHURCH SITE
NIAGARA FALLS, NY

FILE 89D41	OCTOBER 1989

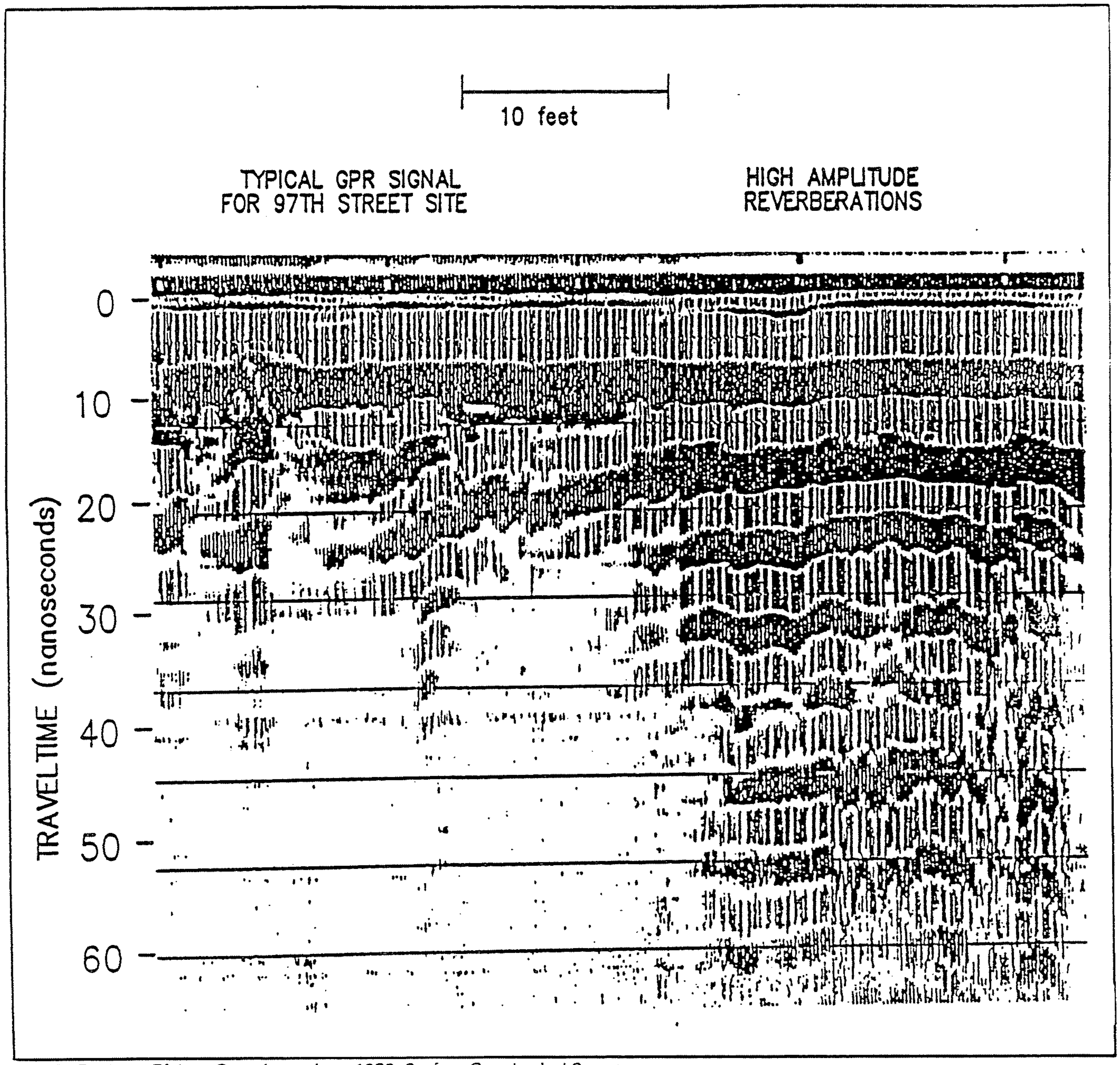
HAGER–RICHTER GEOSCIENCE, INC.
8 Industrial Way, D10
Salem, NH 03079



SEISMIC LINE SL5
W
E
SL4
SL2
DEPTH (FEET)
0
20
40
0+00
1+00
2+00
1300
5300
18000
LEGEND
18000
SEISMIC VELOCITY (ft/sec)
INTERSECTING SEISMIC LINE
20 FEET
SCALE
Figure B-5
LINE SL5 PROFILE
97TH STREET METHODIST CHURCH SITE
NIAGARA FALLS, NY
FILE 89D41
OCTOBER 1989
HAGER-RICHTER GEOSCIENCE, INC.
8 Industrial Way, D10
Salem, NH 03079

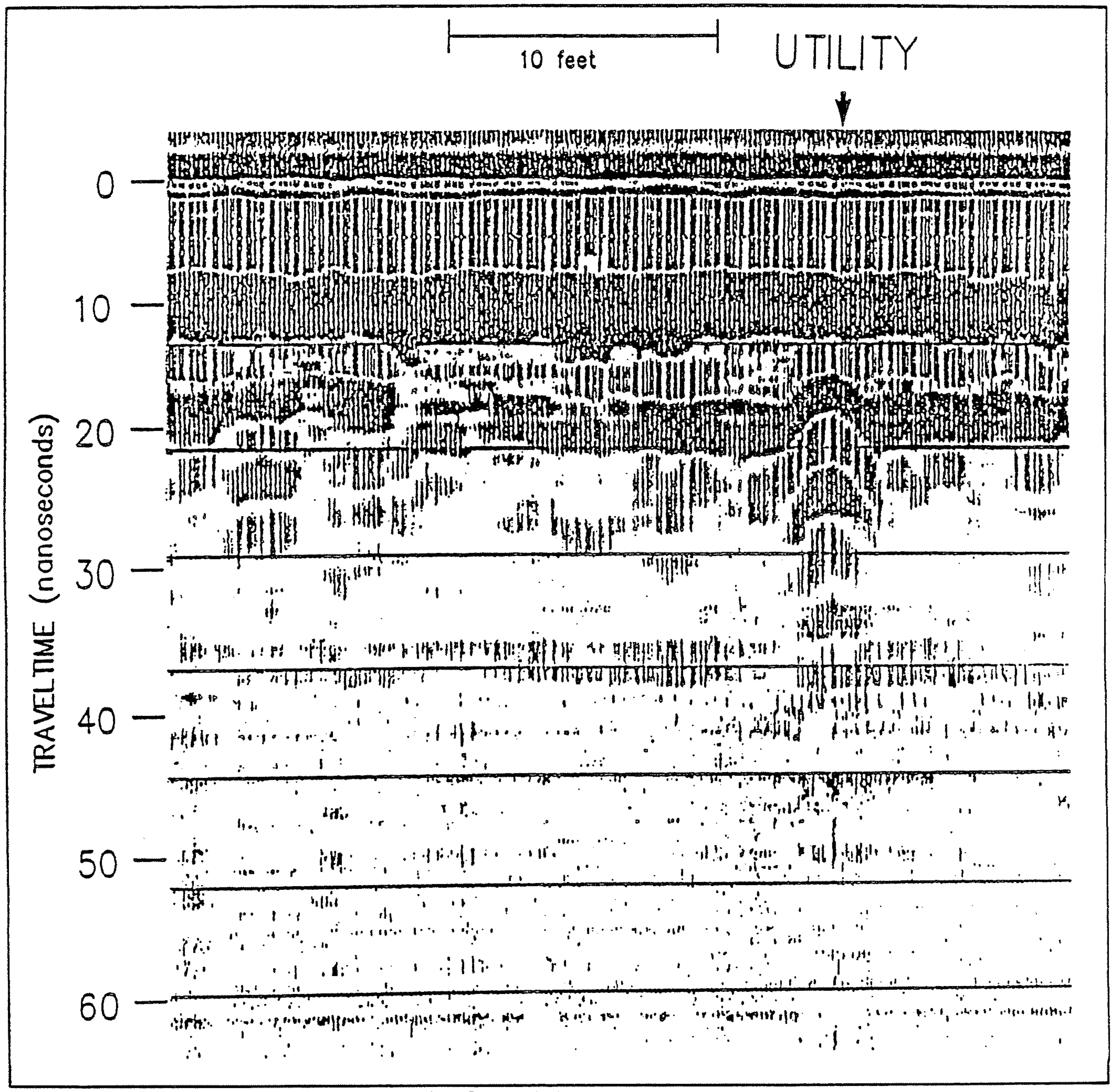
APPENDIX B-3

GROUND PENETRATING RADAR PROFILES



SOURCE: Hager-Richter Geoscience, Inc., 1989, Surface Geophysical Surveys.

Figure C–1 GPR SIGNAL TYPICAL OF THE SITE AND AN EXAMPLE OF HIGH AMPLITUDE REVERBERATIONS. SHOWN IS LINE C 0+90 TO 1+35.



SOURCE: Hager-Richter Geoscience, Inc., 1989, Surface Geophysical Surveys.

Figure C–2 GPR SIGNATURE CHARACTERISTIC OF BURIED UTILITIES. SHOWN IS LINE D 0+15 TO 0+35; 97TH STREET METHODIST CHURCH SITE, NIAGARA FALLS, NEW YORK.

APPENDIX C

DRILLING AND CORING LOGS FOR EXISTING AND NEW GROUNDWATER MONITORING WELLS

NEST 90

JRB ASSOCIATES, INC.
8400 Westpark Drive, McLean, Virginia 22102

WELL LOG

PROFILE	DESCRIPTION
0	BLACK SAND/ASH AND SILTY CLAY WITH GRAVEL
2.5'	YELLOW BROWN SILTY CLAY
4'	YELLOWISH REDDISH BROWN SILTY CLAY
6.5'	REDDISH BROWN SILTY CLAY
9'	REDDISH GRAY CLAY
11'	GRAY BROWN CLAY
12'	REDDISH GRAYISH BROWN CLAY MOIST PLASTIC
20.5'	REDDISH BROWN TILL PEBBLES
22.5'	

PROJECT Love Canal

OWNER United Methodist Church

WELL NO. 90-A (GW-3151)

LOCATION 9610 Colvin Blvd. - back of parking lot near 97th St.

	Date	Time
DRILLING STARTED	9/24/80	1438
DRILLING COMPLETED	9/24/80	1620

DRILLER Ed Cole

GEOLOGIST Dennis Stanczuk

RIG TYPE Acker AD-2

REFERENCE POINT land surface

R.P. ELEVATION not surveyed 573.1

TOPO POSITION flat

PROFILE BY Dennis Stanczuk

FIELD BOOK NO. 2 PAGES 77-78

WELL DATA

HOLE DIAMETER 6.5"

HOLE DEPTH 22.5'

CASING DIAMETER 2"

CASING LENGTH 21.5'

SCREEN DIAMETER 2"

SCREEN SETTING 20.5'-18.5'

SCREEN SLOT/TYPE .001" Johnson stainless steel

PUMP TEST DATA

STATIC DEPTH TO WATER Dry hole

DATE MEASURED 9/24/80

PUMPING DEPTH TO WATER not tested

TEST DURATION

PUMPING RATE

TEST DATE

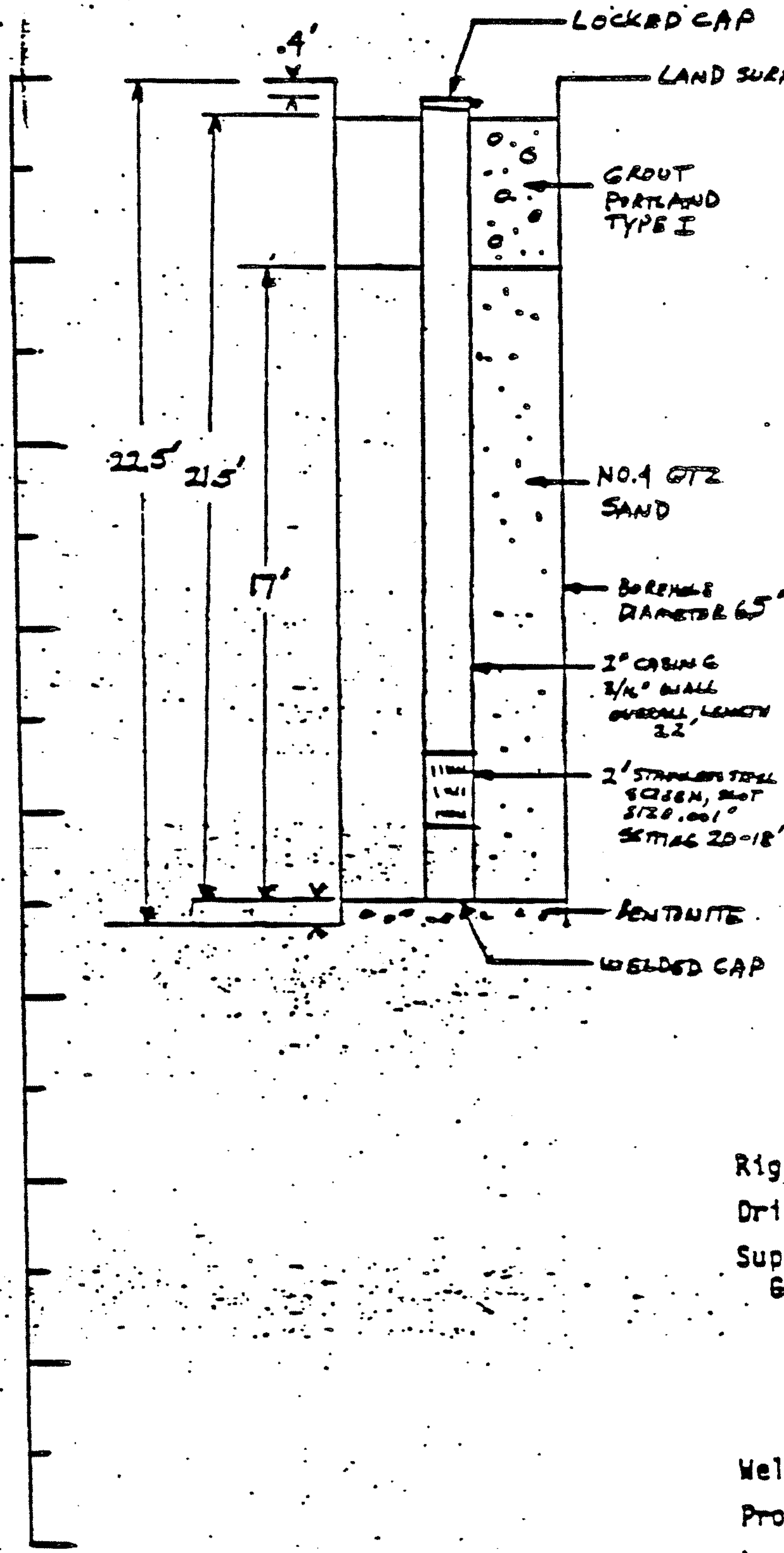
TEST TYPE

PUMP SETTING

SPECIFIC CAPACITY

REMARKS

AS-BUILT DRAWING



CHECKLIST

Land Surface Elevation
Casing Height Above L-S
Total Depth
Borehole Diameter
Casing Diameter
Casing Thickness
Casing Lengths
Screen Data
  Material
  Diameter
  Slot Openings
  Seitings
Centralizers
Grout Type
Gravel Pack
K-Fittings
Packers
Cement Baskets

Rig Type ___Acker AD-2___
Driller ___Ed Cole___
Supervisory Geologist ___Dennis Stanczuk___

Well No. ___90-A___
Project ___Love Canal___
Location ___9610 Colvin Blvd. - back of parking lot near 97th St.___

Date ___9/24/80___

Prepared By: ___Dennis Stanczuk___
Scale: ___1"=5'___

JRB ASSOCIATES, INC.
8400 Westpark Drive, McLean, Virginia 22102

WELL LOG

PROFILE	DESCRIPTION
0' – 2.5'	BLACK SAND & SILTY CLAY WITH GRAVEL
2.5' – 4'	YELLOW BROWN SILTY CLAY MOIST PLASTIC
4' – 7'	YELLOWISH REDDISH BROWN SILTY CLAY
7' – 9'	REDDISH BROWN SILTY CLAY MOIST
9' – 20.5'	REDDISH GRAY BROWN SILTY CLAY MOIST PLASTIC
20.5' – 22.0'	REDDISH BROWN SILTY TILL WITH PEBBLES, SOFT
22.0' – 28'	HARD TILL
28' – 30.5'	WET TILL
30.5' – 35.5'	DOLOMITE

PROJECT: Love Canal
OWNER: United Methodist Church
WELL NO.: 90-B (GW-3251)
LOCATION: 9610 Colvin Blvd. - back of parking lot near 97th St.

	Date	Time
DRILLING STARTED	9/24/80	0930
DRILLING COMPLETED	9/27/80	1300

DRILLER: Ed Cole
GEOLOGIST: Dennis Stanczuk
RIG TYPE: Acker AD-2
REFERENCE POINT: land surface
R.P. ELEVATION: not surveyed 573.1
TOPO POSITION: flat
PROFILE BY: Dennis Stanczuk
FIELD BOOK NO.: 2 PAGES 74-76, 85-86

WELL DATA

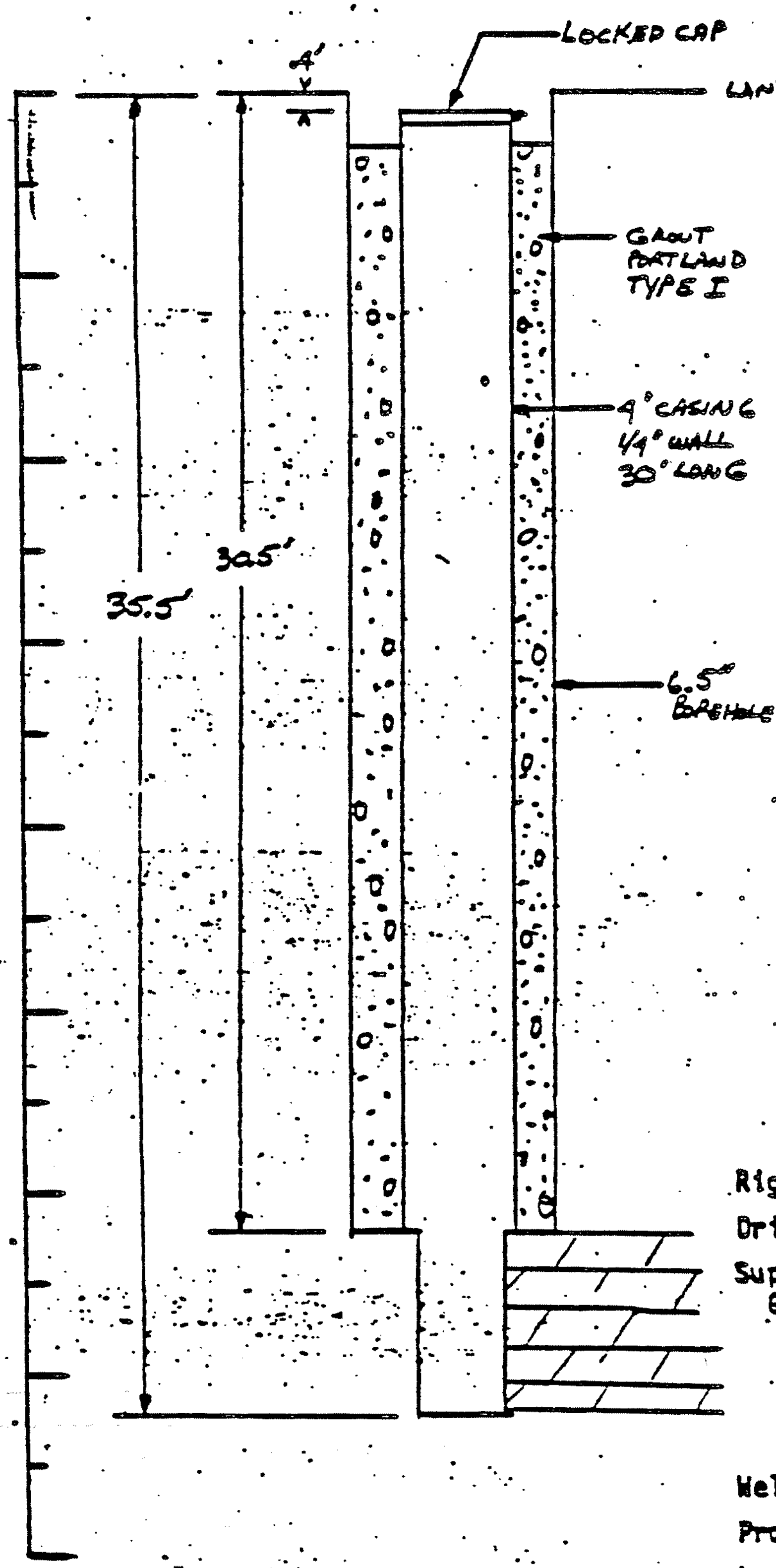
HOLE DIAMETER: 6.5" auger / 2 15.16 Tricone
HOLE DEPTH: 30.5'/35.5'
CASING DIAMETER: 4"
CASING LENGTH: 30'
SCREEN DIAMETER: N/A
SCREEN SETTING: N/A
SCREEN SLOT/TYPE: N/A
DEPTH TO BEDROCK: 30.5'

PUMP TEST DATA

STATIC DEPTH TO WATER: 29.1'
DATE MEASURED: 9/24/80
PUMPING DEPTH TO WATER: not tested
TEST DURATION:
PUMPING RATE:
TEST DATE:
TEST TYPE:
PUMP SETTING:
SPECIFIC CAPACITY:

REMARKS

AS-BUILT DRAWING



CHECKLIST

- Land Surface Elevation
- Casing Height Above L-S
- Total Depth
- Borehole Diameter
- Casing Diameter
- Casing Thickness
- Casing Lengths
- Screen Data
  - Material
  - Diameter
  - Slot Openings
  - Seitings
- Centralizers
- Grout Type
- Gravel Pack
- K-Fittings
- Packers
- Cement Baskets

Rig Type a Acker AD-2

Driller Ed Cole

Supervisory Geologist Dennis Stancruk

Well No. 90-B

Project Love Canal

Location 9610 Colvin Blvd. - back of parking lot near 97th St.

Date 9/27/80

Prepared By: Dennis Stancruk

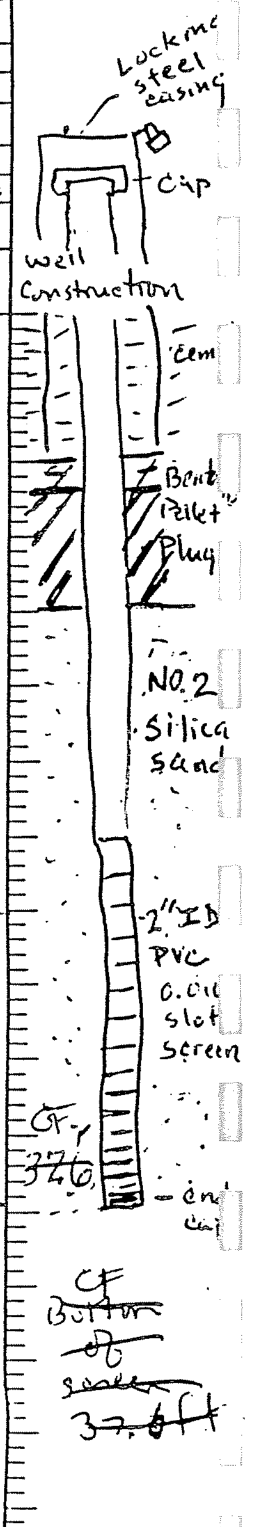
Scale: 1"=5'

DRILLING LOG	DIVISION NYSDEC - Albany	INSTALLATION Ecology + environment, Inc.	SHEET 1 OF 1 SHEETS

(NW of Church)

1. PROJECT 97th St Methodist Church Site	10. SIZE AND TYPE OF BIT 4 1/4" I.D.
2. LOCATION (Coordinates or Station) 9610 Colvin Blvd Niagara Falls NY	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY Buffalo Drlg. Co.	12. MANUFACTURER'S DESIGNATION OF DRILL Mobile B-34
4. HOLE NO. (As shown on drawing title and file number) GW-3155	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN ~~DISTURBED~~ 6 ~~UNDISTURBED~~
5. NAME OF DRILLER Charles NRometi	14. TOTAL NUMBER CORE BOXES NA
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.	15. ELEVATION GROUND WATER DRY WELL
	16. DATE HOLE STARTED 11/29/89 COMPLETED 11/30/89
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING NA %
9. TOTAL DEPTH OF HOLE 12.4 ft	19. SIGNATURE OF INSPECTOR G. Florentino

~~ELEVATION~~ Soil Class	DEPTH b	~~LEGEND~~ Blow Counts	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
ML		3-3 5-6	Dark brown, orange, & gray mottled, v. fine sandy, ~~silt~~ clayey silt, brittle, hard, Dry	80	1	0-2 ft
ML	2	4-5 8-7	Dark brown, gray, clayey silt, brittle, v. hard, Dry	80	2	Sampled for grain size 2-4 ft
CL			Dark reddish-brown silt and clay, semi-plastic, Dry			
CL	4	6-11 16-24	Same as above with some micro-layering (desication cracks possibly), Very hard, brittle, Dry	95	3	4-6 ft
CL	6	6-13 19-22	Same as previous interval, Solid core (no layering). Bottom 4" softer, semi plastic, dry	95	4	6-8 ft End drilling 11/29/89
CL	8	5-8 10-13 (gray red)	Dark reddish-brown, silty clay, varved, color variations between layers, hard, plastic (semi), Dry	99	5	Continued 11/30/89 8-10 ft
CL	10	4-7 11-11	Same as previous interval, Still semi-plastic, but more plastic than previous interval, hard, Slightly moist 12.4 ft	100	6	10-12 ft Sampled for Hydrometer + Atterberg T.D. 11/30/89
	12					
	14					
	16					
	18					
	20					



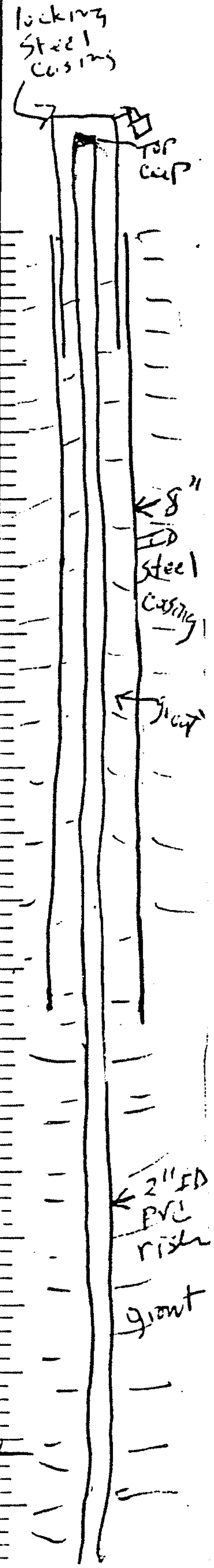
ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. | PROJECT | HOLE NO.

DRILLING LOG | DIVISION: NYSDEC – Albany | INSTALLATION: Ecology + Environment, Inc. | SHEET 1 OF SHEETS

1. PROJECT: 97th St Methodist Church Site
2. LOCATION (Coordinates or Station): 9610 Colvin Blvd, Niagara Falls, NY (SW of Church)
3. DRILLING AGENCY: Buffalo Drilling Co.
4. HOLE NO. (As shown on drawing title and file number): GW-3257
5. NAME OF DRILLER: Charles Nrometi
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT: 6¼" I.D.
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL: Mobile B-34
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: ~~DISTURBED~~ 13 | ~~UNDISTURBED~~
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 11/30/89 | COMPLETED 12/6/89
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

~~ELEVATION~~ Soil Class a	DEPTH b	~~LEGEND~~ Blow Counts c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
ML		3-5, 6-7	Dark brown, orange and red mottled clayey silt, brittle, Dry, soft, no apparent bedding	80	1	0-2 ft
ML/CL	2	5-10, 11-13, HARD	Dark brown, orange + gray mottled silt and clay, semi-plastic, Dry, possibly deformed bedding, plant roots, Some fill mat'l (possibly ash)	50	2	2-4 ft Sampled for Full TCL
ML/CL	4	4-10, 14-26, 1 sch ...	Same as previous interval without roots, vertical seam (gray silt) possibly representing a vertical dessication crack, Dry, HARD	80	3	4-6 ft Sampled for Hydrometer
CL	6	8-16, 24-29	Dark brown with gray and red bands along bedding, silty clay, varved, evidence of vertical dessication crack in upper 6 inches, Semi-plastic, Dry, Soft	70	4	6-8 ft
CL	8	4-6, 8-10	Same as previous interval with a very fine sand + silt lens 3 inches from the top, red varved clay bottom 1 inch, gray silty zone 1' from top of sample.	90	5	8-10 ft
CL	10	3-4, 5-7	Same as previous interval, but more sticky (plastic), Moist to wet near the bottom of the sample, varved, thicker beds in the bottom 4 inches	100	6	10-12 ft; T.D. 11/30 T.D. at 11.5 ft until surface casing is put in place.
CL	12	4-2, 3-3	Dark brn, brownish-red, gray, orange-brown, varved clay + silt, plastic, moist, v. sticky, soft	100	7	12-14 Installed 8" ID Steel Casing, grouted in place.
CL	14	2-2, 3-3	Same as previous interval (varved clay w/occassional silt layers)	100	8	14-16'
CL/ML	16	1-2, 2-3	Dark brown, brownish-red, gray pebbly (10%) (subrounded - subangular), silt and clay, semi-plastic,	100	9	16-18'
SM/SC			Same colors, silty, clayey sand, F. to m-grained, gravelly (subrnd - subang) ~1-2 cm (20%), poorly sorted, moist, sandy			
SM/SC	18	2-6, 5-7	Same as 17-18 ft interval, larger pebbles 2-3 cm, well rounded dark gray-black limestone, poorly sorted, moist	50	10	18-20'
	20					

WELL Construction



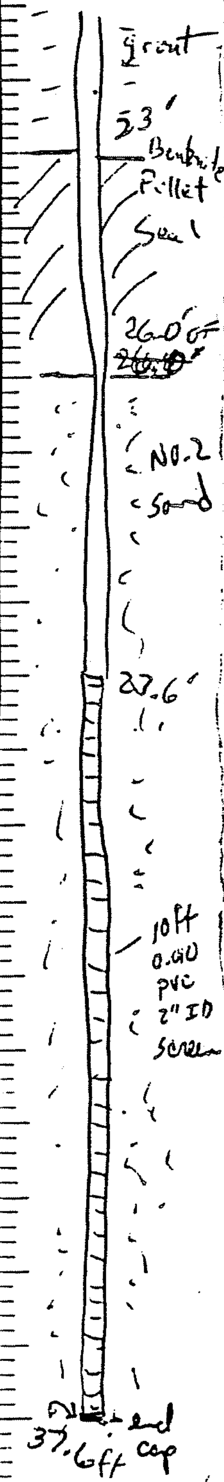
ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. | PROJECT | HOLE NO.

SW of Church

DRILLING LOG	DIVISION NYSDEC - Albany	INSTALLATION Ecology + Environment	SHEET 2 OF SHEETS

1. PROJECT 17th St Church Site	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station) 9610 Colvin Blvd, Niagara Falls, NY	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY Buffalo Drilling Co	12. MANUFACTURER'S DESIGNATION OF DRILL Mobile B-34
4. HOLE NO. (As shown on drawing title and file number) GW-3257	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — ~~DISTURBED~~ — UNDISTURBED
5. NAME OF DRILLER C. Necometi	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

Soil Class (~~ELEVATION~~) a	DEPTH b	New Legend (~~LEGEND~~) Counts c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Rock type SM/SC		4-refusal	Same as previous interval	15	11	20-22 ft Split spoon Refusal
SM/GM	22	37-32 -16- 100/5"	Dark brown, silty, gravelly (15% dark gray LS fragments, subangular 1-4 cm) fine to v. fine sand, poorly sorted, dry	~~80~~ 100	12	22-24 ft Split spoon refusal
	24	65- 100/5	Same as previous interval, dry	100	13	24-26 ft Split spoon Refusal
	26, 28		Medium to light gray Limestone, stylolite, Mostly fractured, some at high angles (40° + 75°), fractures are filled with clay, weathered. 30.1 ft	35 Broken Rx, Broken rx	1 .2 .35 .38 .2 .4	Auger Refusal at approx. 25 ft. Core No. 1 25 to 30.1 ft unable to determine RQD because rock too fractured.
	30, 32, 34, 36, 38, 40		Top 0.4 ft Broken rock Same as previous interval followed by 1.0 ft of light greenish-gray LS, massive. Remain of the core is med to dark gray LS, heavily fractured (horizontal), some mineralization along fractures and small vugs (gypsum), stylolite, massive bedding	90	2	Breaks 0.4 Broken rx, 0.3, 0.1, 0.45, 0.1, 0.35 Broken rx, 0.3, 0.2, 0.15, 0.22, 0.15, 0.14, 0.1, 0.15, 0.09, 0.2, 0.09, 0.1, 0.21, 0.32, 0.16, 0.23, 0.04, 0.07, .15, .40, .06, .38, .12, .50, .37, .33, .35, .05, .15, .12, .40, .70 TD 39.3 ft



ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. PROJECT HOLE NO.

Hole No. GW-3159

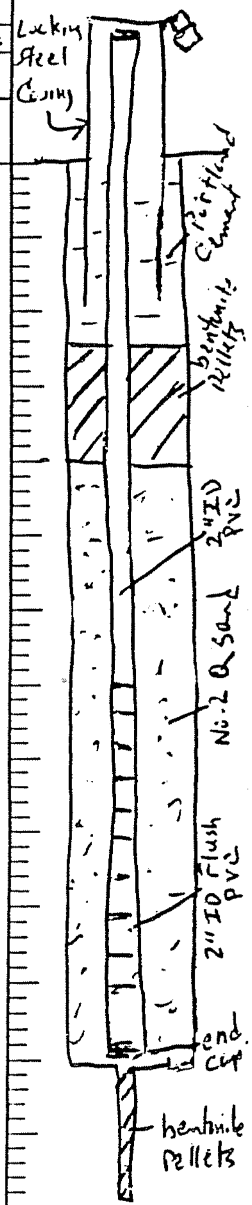
DRILLING LOG

DIVISION	NYSDEC - Albany
INSTALLATION	Ecology + Environment, Inc.
SHEET	1 OF 1 SHEETS
1. PROJECT	97th St Methodist Church Site
2. LOCATION (Coordinates or Station)	9610 Colvin Blvd. SE section of property
3. DRILLING AGENCY	Buffalo Drilling Co.
4. HOLE NO. (As shown on drawing title and file number)	GW-3159
5. NAME OF DRILLER	C. Necometi
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	4¼" I.D. Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	Mobile B-34
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 7 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	NA
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 12/1/89 / COMPLETED
17. ELEVATION TOP OF HOLE	
18. TOTAL CORE RECOVERY FOR BORING	NA %
19. SIGNATURE OF INSPECTOR	

~~ELEVATION~~ Soil Class	DEPTH b	Blow Counts	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
ML	0–2	1-3, 2-2	Dark brown, orange mottled, v. fine sandy, clayey silt, some pebbles (subangular-subrounded), soft, slightly moist, brittle	50	1	0-2 ft
ML	2–4	3-5, 6-8	Dark brown, orange and gray mottled clayey silt, hard, brittle, Dry	70	2	2-4 ft Sampled for Full TCL and grain size
CL	4–6	5-10, 14-20	Med. brownish-red, silty clay, varved, gray and orange along bedding planes, hard, semi plastic, Dry	90	3	4-6 ft
CL	6–8	8-18, 27-31	Dark brown, silty clay, varved, evidence of a vertical dessization crack filled with gray silt, semi-hard, semi-plastic, Dry	85	4	6-8 ft
CL	8–10	3-6, 8-10	Dark brown, silty clay, varved, with a thin gray silt layer (3mm) below a 1.5 inch thick brownish-red clay zone approx. 4 inches from bottom of sample, soft, semi-plastic, Dry	95	5	8-10 ft
CL	10–12	3-4, 5-4	Same as previous interval with 2mm gray silt zone approx 6 inches from top of sample and alternating clay and silt layers in the bottom 3 inches of sample, soft, sticky, moist	98	6	10-12 ft Sampled for Atterberg
CL	12–14	3-3, 4-4	Dark brown and reddish-brown varved clay with occasional gray silt layers, very sticky, plastic, very moist	100	7	12-14 ft

The borehole will be terminated at 12.2 feet. The split spoon hole between 12-14 ft was sealed with bentonite pellets

Well Construction



APPENDIX D

GEOTECHNICAL ANALYSES

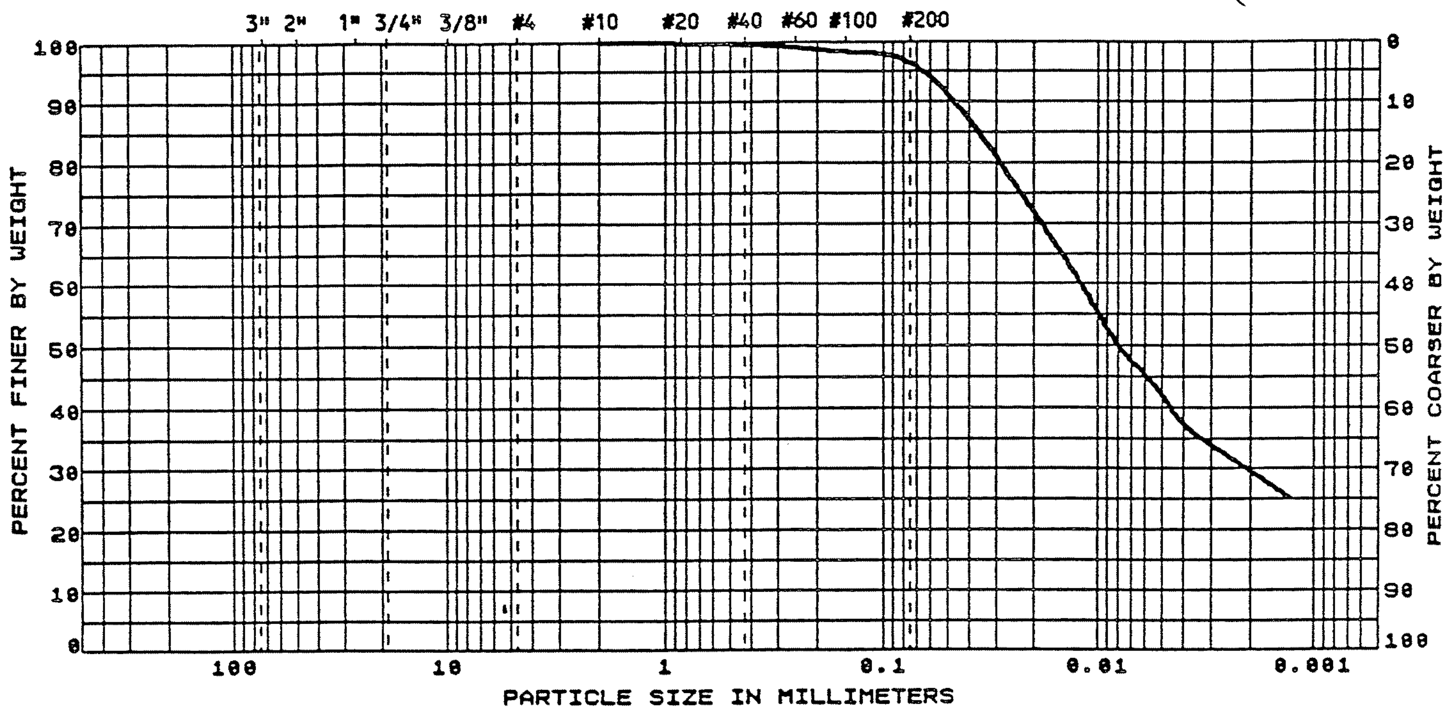
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genessee Street
Buffalo, New York 14225

JOB NO. 41-8905.13 DATE January 15, 1990
LAB NO. 9688 PAGE 1
PROJECT E & E PO#50809/PR#L-4037
SAMPLE ID 58507.01E & E Job No.1044.002

Gw-3155-1 (2-4 ft)



COBBLES	GRAVEL		SAND			SILT & CLAY
	COARSE	MEDIUM	CO.	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE: SIEVE NO.	SIEVE SIZE (MILLIMETERS)	PERCENT PASSING		HYDROMETER PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		71.8	0.020
1-1/2"	37.5		41.7	0.005
1"	25		29.6	0.002
3/4"	19			0.001
1/2"	12.5			
3/8"	9.5			
#4	4.75			
#10	2.00	100.0		
#20	0.850	99.8		
#40	0.425	99.5		
#60	0.250	99.0		
#100	0.150	98.3		
#200	0.075	96.5		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
CLASSIFICATION ()

WATER CONTENT (%) 22.3
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D2216, D2487, D4318.

LAW ENVIRONMENTAL, INC.
M.A. O'Kelly

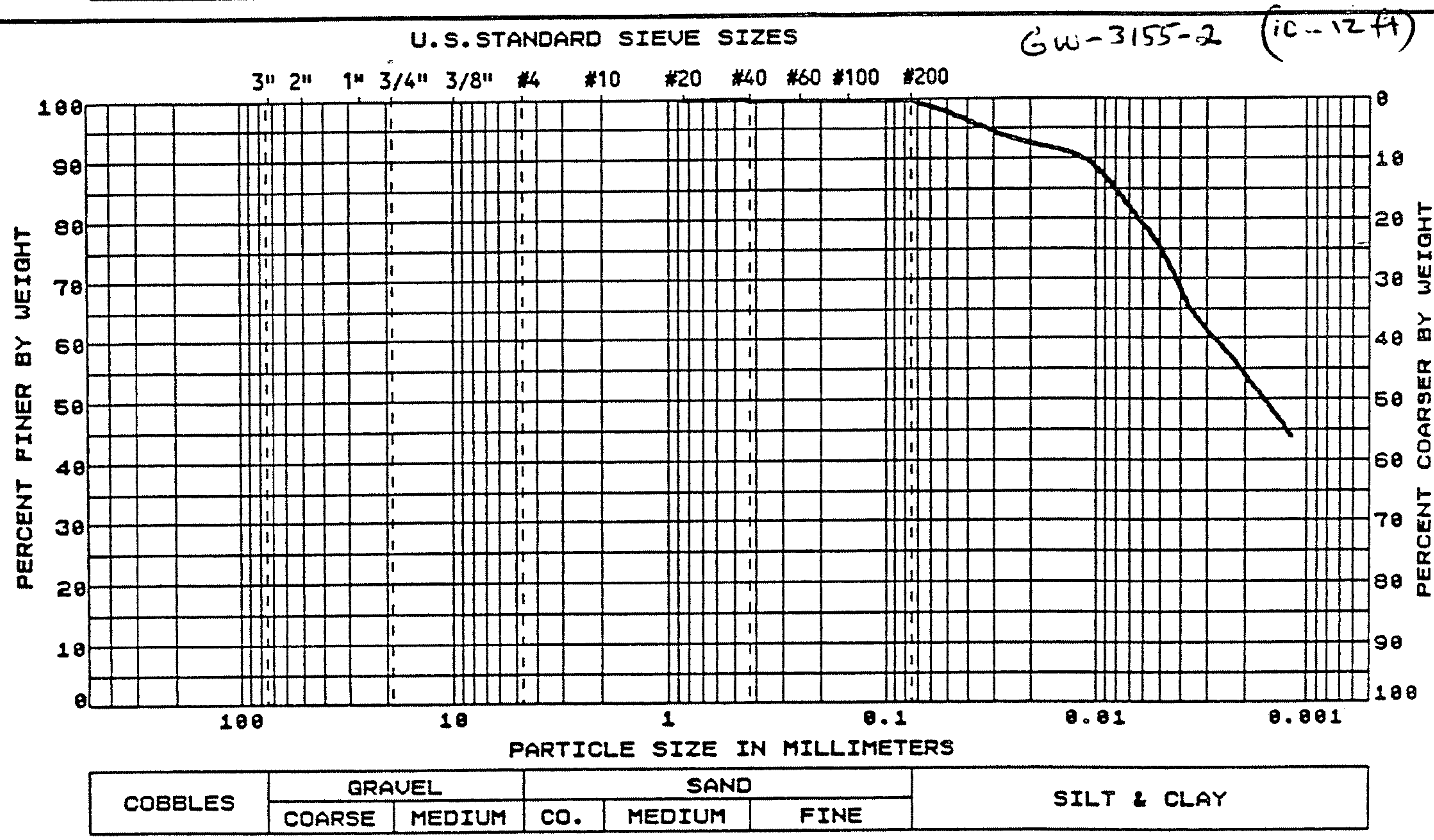
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genessee Street
Buffalo, New York 14225

JOB NO. 41-8905.13 DATE January 15, 1990
LAB NO. 9689 PAGE 2
PROJECT E & E PO#50809/PR#L-4037
SAMPLE ID 58508.01E & E Job No.1044.002

GW-3155-2 (IC-12A)



U.S. STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		92.6	0.020
1-1/2"	37.5		75.0	0.005
1"	25		53.7	0.002
3/4"	19			0.001
1/2"	12.5			
3/8"	9.5			
#4	4.75			
#10	2.00			
#20	0.850	100.0		
#40	0.425	99.8		
#60	0.250	99.6		
#100	0.150	99.6		
#200	0.075	99.6		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 45
PLASTIC LIMIT 22
PLASTICITY INDEX 23
CLASSIFICATION LEAN CLAY (CL)

WATER CONTENT (%) 28.6
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D2216, D2487, D4318.

LAW ENVIRONMENTAL, INC.
M. A. Kelley

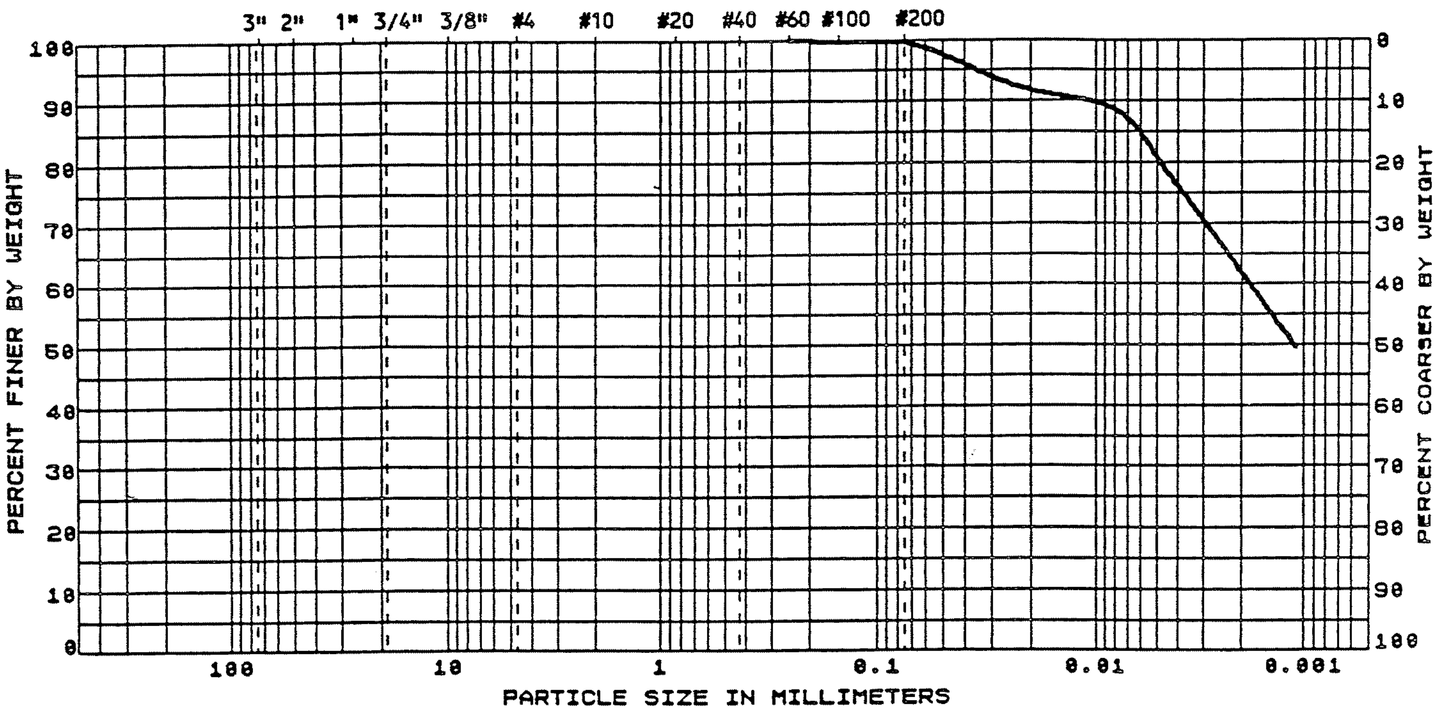
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genessee Street
Buffalo, New York 14225

JOB NO. 41-8985.13 DATE January 15, 1990
LAB NO. 9690 PAGE 3
PROJECT E & E PO#58809/PR#L-4037
SAMPLE ID 58510.01E & E Job No.1044.002

GW-3257-1 6-8ft



COBBLES	GRAVEL		SAND			SILT & CLAY
	COARSE	MEDIUM	CO.	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		91.9	0.020
1-1/2"	37.5		80.6	0.005
1"	25		62.0	0.002
3/4"	19			0.001
1/2"	12.5			
3/8"	9.5			
#4	4.75			
#10	2.00			
#20	0.850			
#40	0.425			
#60	0.250	100.0		
#100	0.150	99.8		
#200	0.075	99.6		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
CLASSIFICATION ()

WATER CONTENT (%) 24.4
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D2216, D2487, D4318.

LAW ENVIRONMENTAL, INC.
M. A. O'Kelley

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ecology and environment

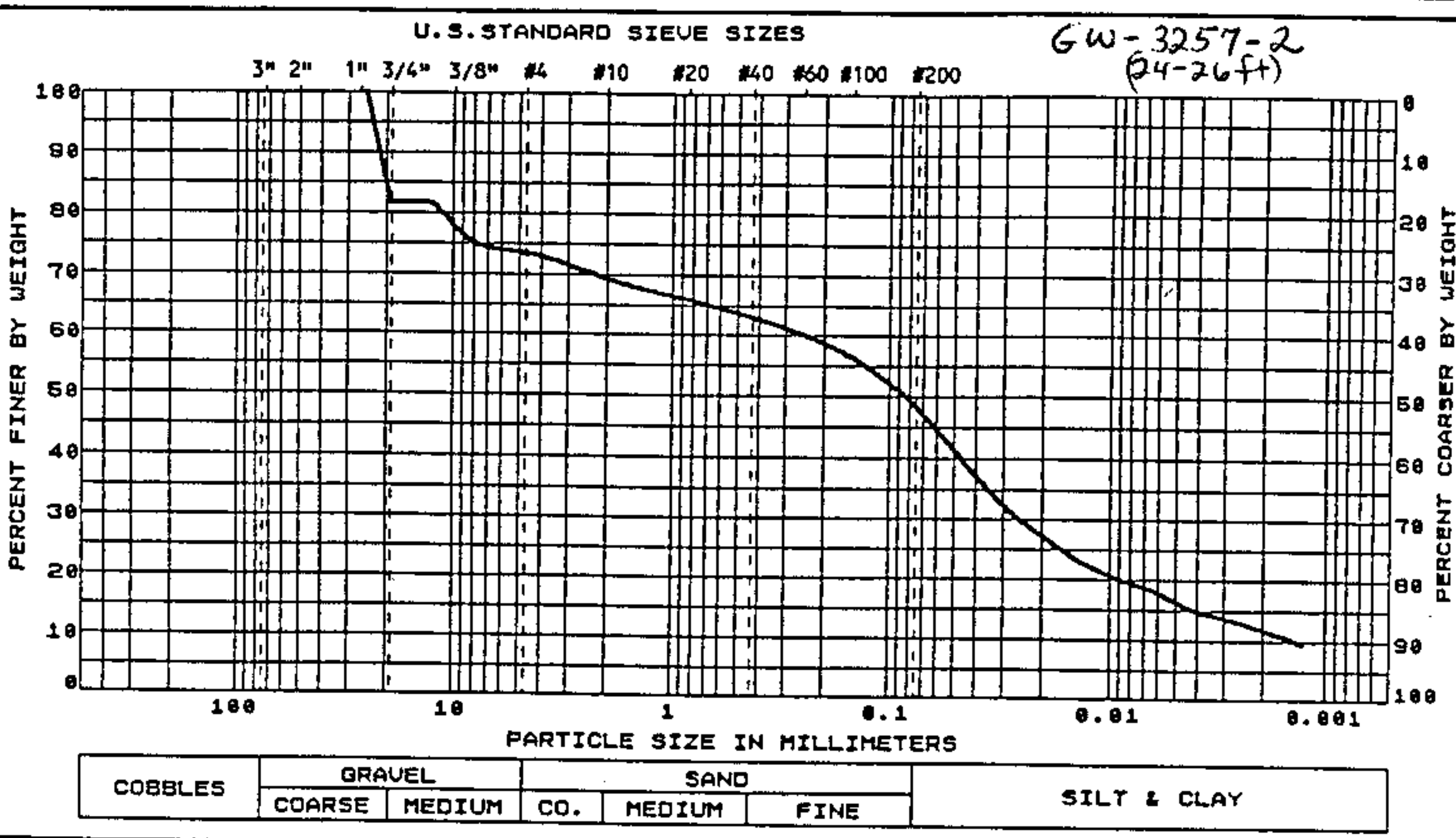
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genesee Street
Buffalo, New York 14225

JOB NO. 41-0905.13 DATE January 15, 1990
LAB NO. 9694 PAGE 1
PROJECT E & E PO#50809/PR#L-4037
SAMPLE ID 58694.01E & E Job No.1044.004

GW-3257-2
(24-26 ft)



U.S. STANDARD SIEVE SIZE: SIEVE NO.	SIEVE SIZE (MILLIMETERS)	PERCENT PASSING		HYDROMETER: PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		27.4	0.020
1-1/2"	37.5		16.3	0.005
1"	25	100.0	11.6	0.002
3/4"	19	81.8		0.001
1/2"	12.5	81.8		
3/8"	9.5	77.3		
#4	4.75	73.5		
#10	2.00	69.3		
#20	0.850	66.9		
#40	0.425	62.9		
#60	0.250	60.2		
#100	0.150	58.5		
#200	0.075	48.3		

recycled paper

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 17
PLASTIC LIMIT 12
PLASTICITY INDEX 5
CLASSIFICATION SILTY, CLAYEY GRAVEL with SAND (GC-GM)
WATER CONTENT (%) 7.7
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D2216, D2487, D4318.

LAW ENVIRONMENTAL, INC.
M.A. O'Kelley

ecology and environment

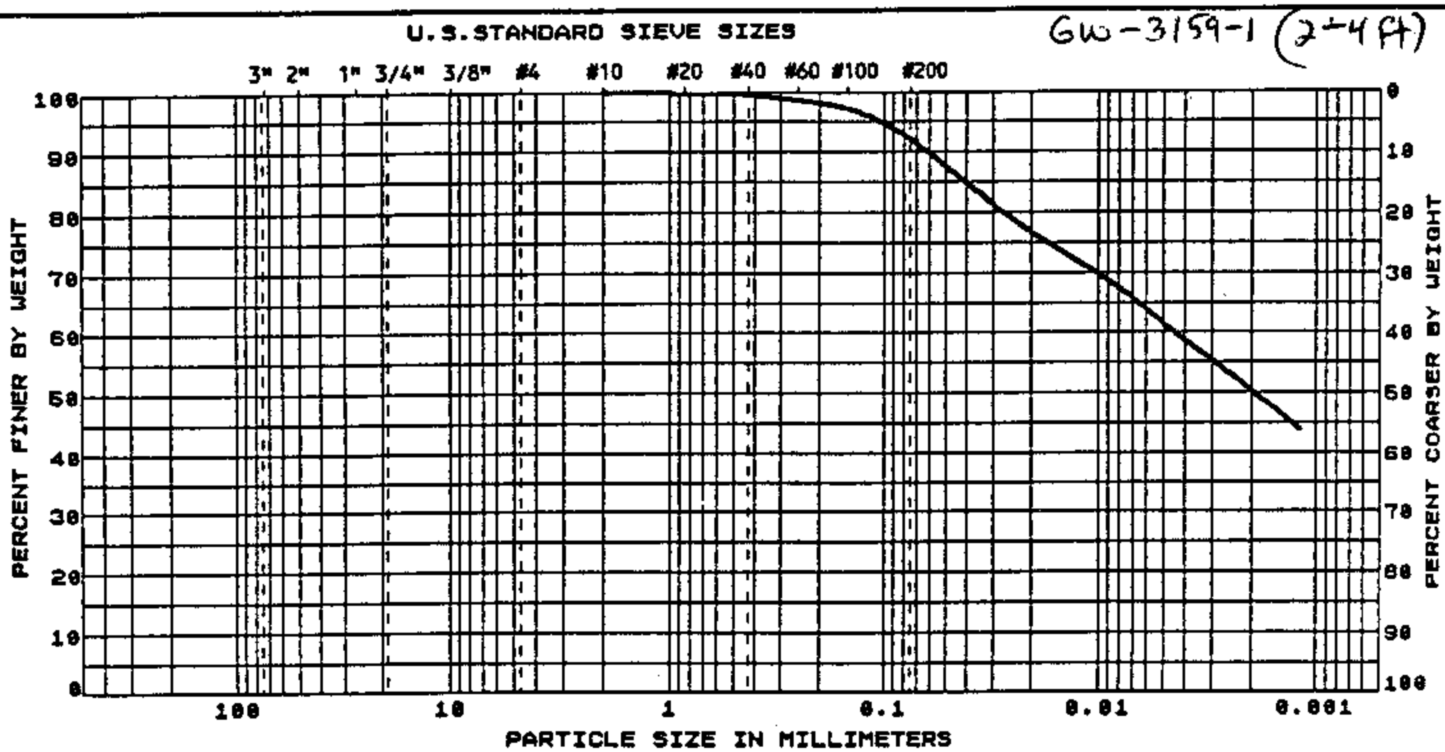
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genessee Street
Buffalo, New York 14225

JOB NO. 41-0905.13 DATE January 15, 1990
LAB NO. 9691 PAGE 4
PROJECT E & E PO#50809/PR#L-4037
SAMPLE ID 50512.01E & E Job No.1044.002

GW-3159-1 (2-4 ft)



COBBLES	GRAVEL		SAND			SILT & CLAY
	COARSE	MEDIUM	CO.	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		76.8	0.020
1-1/2"	37.5		61.4	0.005
1"	25		50.2	0.002
3/4"	19			0.001
1/2"	12.5			
3/8"	9.5			
#4	4.75			
#10	2.00	100.0		
#20	0.850	99.8		
#40	0.425	99.5		
#60	0.250	98.6		
#100	0.150	97.3		
#200	0.075	92.2		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
CLASSIFICATION ()

WATER CONTENT (%) 8.1
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D2216, D2487, D4318.

LAW ENVIRONMENTAL, INC.
M.A. O'Kelley

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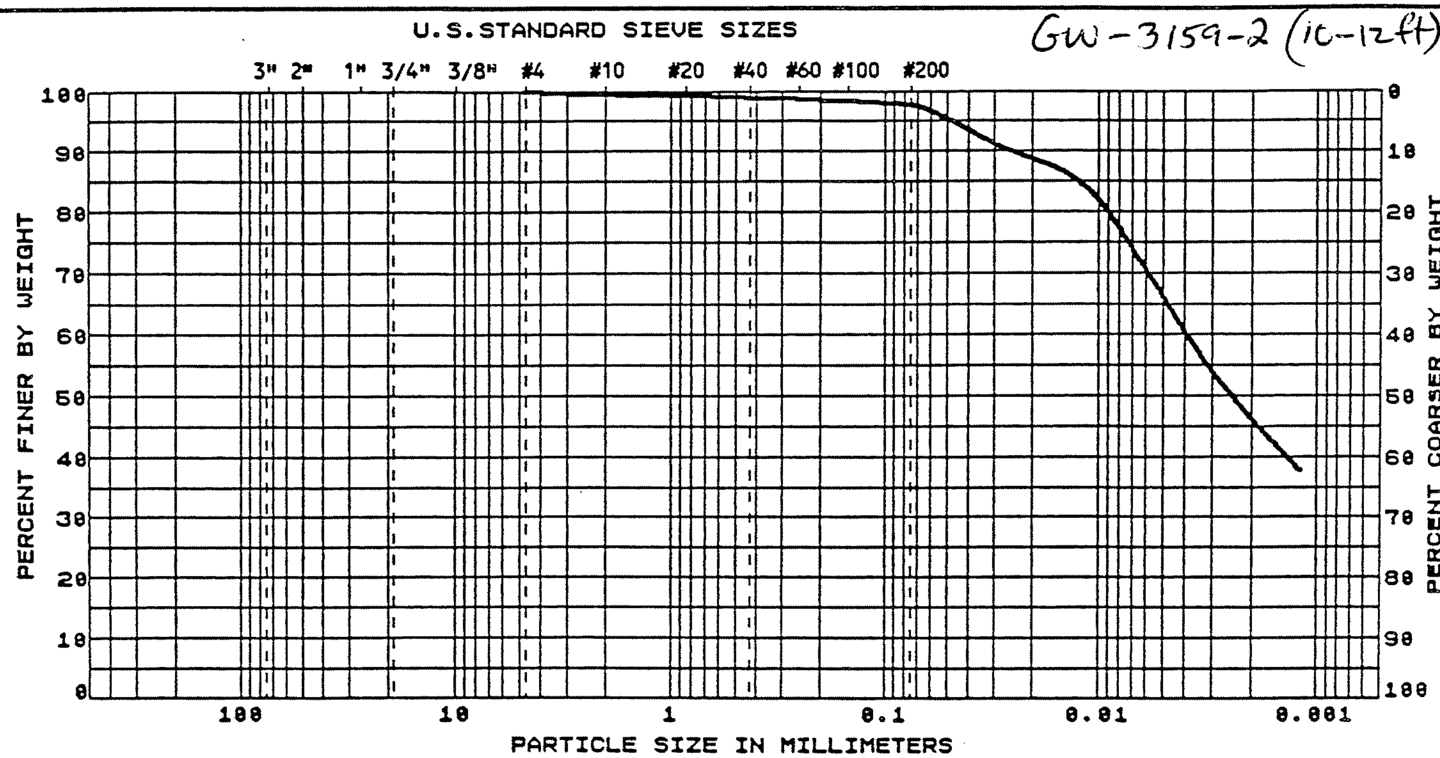
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genessee Street
Buffalo, New York 14225

JOB NO. 41-8985.13 DATE January 15, 1990
LAB NO. 9692 PAGE 5
PROJECT E & E PO#50809/PR#L-4037
SAMPLE ID 58513.01E & E Job No.1044.002

GW-3159-2 (10-12ft)



COBBLES	GRAVEL		SAND			SILT & CLAY
	COARSE	MEDIUM	CO.	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		88.8	0.020
1-1/2"	37.5		65.9	0.005
1"	25		46.6	0.002
3/4"	19			0.001
1/2"	12.5			
3/8"	9.5			
#4	4.75	100.0		
#10	2.00	99.4		
#20	0.850	99.3		
#40	0.425	98.9		
#60	0.250	98.7		
#100	0.150	98.3		
#200	0.075	97.8		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 42
PLASTIC LIMIT 22
PLASTICITY INDEX 20
CLASSIFICATION LEAN CLAY (CL)

WATER CONTENT (%) 27.7
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D2216, D2487, D4318.

LAW ENVIRONMENTAL, INC.
M.A. OKelley

APPENDIX E

SUBSURFACE SOIL, GROUNDWATER, SURFACE SOIL, AND TEST PIT SAMPLING PROCEDURES

Subsurface Soil Sampling

Three subsurface soil samples were collected during drilling. One sample from each well drilled (except GW-3157 because it is adjacent to GW-3257) was collected for chemical analysis from the soil horizon exhibiting the highest degree of contamination (i.e., HNu readings, color, etc.). In addition to these samples, 2 samples were collected beneath the black-top parking lot at a depth of 2 feet. The samples were collected using a decontaminated split spoon sampler driven by a 140-pound hammer on the drill rig. Blow counts and total recovery were recorded for each sample (see Appendix C). After retrieving the sample, it was screened with the OVA and mercury vapor analyzer and a pre-cleaned stainless steel spoon was used to place it in a pre-cleaned, acid rinsed, 8-ounce jar equipped with a teflon-lined lid.

Groundwater Sampling

Six groundwater samples were obtained from each of the four new and two existing monitoring wells on site. A dedicated, decontaminated PVC bailer was used with new, dedicated nylon rope at each well. Prior to sampling, a groundwater-level reading was obtained, along with a total depth-of-well reading. An amount equaling three standing water volumes was calculated and purged prior to sampling. The first bottles to be filled were those for volatile organic compound analysis (two 40 ml clean glass vials with Teflon septum). This was to minimize the turbidation of the water so that the volatile content would remain intact. The second bottles to be filled were those for total metals and dissolved metals analysis (1-liter, high-density polyethylene bottle with Teflon-lined lid for each). A reading of the turbidity was immediately taken using a portable nephelometer. If the reading was greater than 50 NTUs, the dissolved metals bottle was retained for filtration. If the turbidity was lower than 50 NTUs, only the total metals analysis was performed. The third bottle to be filled was that for cyanide analysis (1-liter high-density polyethylene bottle with Teflon-lined lid), and the fourth were those bottles for BNA and PCB/pesticide analysis (two 80-ounce amber glass bottles with Teflon-lined lids).

Additional field parameters measured included pH, temperature, and conductivity. Measurements of pH were taken in triplicate, while measurements of conductivity were taken in quadruplicate for accuracy purposes. Prior to filling, all sample bottles were labeled with waterproof ink and labels were covered with clear mylar tape. After all bottles were filled, the bailer was placed in the well and suspended above the water table, and the well casing lid was locked. The filled bottles were packed into coolers containing vermiculite and ice, then transported at the end of the day back to E & E's ASC for analysis. All samples for metals, both total and dissolved, were preserved by adding concentrated nitric acid to the sample until the pH of the sample was lowered to less than 2.0. All samples for cyanide analysis were preserved by the addition of sodium hydroxide. Pellets of NaOH were added until the pH was raised to greater than 12.0.

Surface Soil Sampling

Six locations were selected for surface soil sampling. All samples were analyzed for TAL/TCL compounds. The individual soil sample was obtained from the top 6 inches of topsoil by using dedicated pre-cleaned stainless steel spoons to fill a pre-cleaned, acid-rinsed, 8-ounce clear glass soil jar equipped with a Teflon-lined lid. This volume served for total metals, base/neutral and acid extractables analysis and PCB/pesticide and cyanide analysis. In addition to the 8-ounce jar, two 40-ml clear glass vials, each equipped with Teflon septum, were filled for volatile organic analysis.

Test Pit Sampling

Three test pits were dug using a backhoe. The excavated soils were placed on plastic sheet, separated in 2-foot interval piles. A soil sample was collected from Test Pits 1 and 2, and a concrete fragment was sampled in Test Pit 3. The soil samples were collected from the side of the test pit wall in areas exhibiting the highest degree of contamination (i.e., OVA reading, color, smell, etc.) in the same manner as described for surface soil sampling. The concrete fragment was placed in a zip-lock plastic bag. The test pits were backfilled in the reverse order in which the materials were removed as to place the soils as close as possible to their original relative locations.

APPENDIX F

RAW ANALYTICAL DATA SUMMARIES

QUALIFIER CODE LEGEND

ORGANIC ANALYSES

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture and a 1 to 10 dilution factor, the sample quantitation limit for phenol (330 U) would be corrected to:

$$\left(\frac{330\ U}{D}\right) \times df \qquad \text{where } D = \frac{100 - \%\ \text{moisture}}{100}$$

and df = dilution factor

$$\text{at 24\% moisture, } D = \frac{100 - 24}{100} = 0.76$$

$$\left(\frac{330\ U}{.76}\right) \times 10 = 4{,}300\ U$$ rounded to the appropriate number of significant figures

For soil samples subjected to GPC cleanup procedures, the CRQL is also multiplied by 2 to account for the fact that only half of the extract is recovered.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data TIC indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 µg/L, but a concentration of 3 µg/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for both dilution and percent moisture as discussed for the U flag, so that if a sample with 24% moisture and a 1 to 10 dilution factor has a calculated concentration of 300 µg/L and a sample quantitation limit of 430 µg/kg, report the concentration as 300J on Form I.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS. Single component pesticides ≥10 ng/µl in the final extract shall be confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified TCL compound.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and re-analyzed according to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Form I's. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted samples, and all concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the Sample Data Summary Package and the Case Narrative. If more than one is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A," "B," and "D" flags for some sample.

INORGANIC ANALYSES

C - Concentration qualifier: Enter "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Q qualifier: Specified entries and their meanings are as follows:

E - The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the Cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).

M - Duplicate injection precision not met.

N - Spiked sample recovery not within control limits.

S - The reported value was determined by the Method of Standard Additions (MSA).

W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance (see Exhibit E).

* - Duplicate analysis not within control limits.

+ - Correlation coefficient for the MSA is less than 0.995.

Entering "S," "W," or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method qualifier: Enter:

P - for ICP;

A - for Flame AA;

F - for Furnace AA;

CV - for Manual Cold Vapor AA;

AV - for Automated Cold Vapor AA;

AS - for Semi-Automated Spectrophotometric;

C - for Manual Spectrophotometric;

T - for Titrimetric; and

NR - if the analyte is not required to be analyzed.

ORGANIC SUMMARY SHEETS OF ANALYTICAL DATA FOR

SUBSURFACE SOIL SAMPLES

GROUNDWATER SAMPLES

DRILL WATER SAMPLE

SURFACE SOIL SAMPLES

TEST PIT SAMPLES

VOLATILES

DATA SUMMARY FORM: V O L A T I L E S 1

WATER SAMPLES
(ug/L)

Site Name: 97th St. Methodist Church

Case #: 1044-004 9000.059 Sampling Date(s): 12/14/89 1/8/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

RQL	Sample No.	GW-3151		GW-3155		GW-3157		GW-3159		GW-3251		GW-3257		GW-3257 MS		GW-3257 MSD		GW-3257-DW	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	Location																		
	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	*Vinyl Chloride																		
10	Chloroethane																		
5	*Methylene Chloride	5	B	3	BJ	6	B	4	BJ	3	BJ	6	B	6	B	6	B	25	B
10	Acetone	15	B	10	B	26	B	40		16	B	140	B	120	B	120	B	36	B
5	Carbon Disulfide																		
5	*1,1-Dichloroethene																		
5	1,1-Dichloroethane																		
5	*Total-1,2-Dichloroethene																		
5	Chloroform																	8	B
5	*1,2-Dichloroethane																		
10	*2-Butanone																		
5	*1,1,1-Trichloroethane																		
5	*Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																	7	

CRQL = Contract Required Detection Limit   *Action Level Exists   SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: 97th St. Methodist Church

Case #: 1044.004 9000.059 Sampling Date(s): 12/4/90 1/8/90

WATER SAMPLES
(ug/L)

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

QL	Sample No.	GW-3151	GW-3155	GW-3157	GW-3159	GW-3251	GW-3257	GW-3357 MS	GW-3357 MSD	GW-3257-DW
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location									
	COMPOUND									
	*1,2-Dichloropropane									
	Cis-1,3-Dichloropropene									
	Trichloroethene									
	Dibromochloromethane									3 J
	1,1,2-Trichloroethane									
	*Benzene									
	Trans-1,3-Dichloropropene									
	Bromoform									
0	4-Methyl-2-pentanone									
0	2-Hexanone									
	*Tetrachloroethene									
	1,1,2,2-Tetrachloroethane									
	*Toluene									
	*Chlorobenzene									
	*Ethylbenzene									
	*Styrene									
	*Total Xylenes						2 J	1 J	2 J	

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: TENTATIVELY INDENTIFIED COMPOUNDS

Site Name: 97th St Methodist Church

WATER SAMPLES
(ug/L)

Case #: ______ Sampling Date: 1/8/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No.	GW-3151	GW-3155	GW-3157	GW-3159	GW-3251	GW-3257	GW-3257MS	GW-3257MSD	GW-3257-DW
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location									
	COMPOUND									
	Hexane, CAS No. 110543	19 BJ		18 BJ	23 J		21 BJ			20 BJ
	Ethyl-methyl Benzene						5 J			

CRQL = Contract Required Quantitation Limit

DATA SUMMARY FORM: V O L A T I L E S 1

SOIL SAMPLES
(ug/Kg)

Site Name: 97th St. Methodist Church

Case #: 1044.001 1044.002 Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

Sample No.	GW-3155		GW-3154		GW-3257		SS-1		SS-2		SS-3		SS-4		SS-5		SS-6	
Dilution Factor	1.0		1.0		1.0		1.0		1.0		1-0		1.0		1.0		1.0	
% Moisture	19%		16%		17%		30%		28%		28%		28%		28%		30%	
Location																		
COMPOUND																		
Chloromethane																		
Bromomethane																		
Vinyl Chloride																		
Chloroethane																		
Methylene Chloride	8	B	5	BJ	5	BJ	12	B	9	B	11	B	13	B	6	BJ	7	B
Acetone	50	B	59	B	30	B	20	B	18	B	24	B	25	B	36	B	29	B
Carbon Disulfide																		
1,1-Dichloroethene																		
1,1-Dichloroethane																		
Total-1,2-Dichloroethene																		
Chloroform																		
1,2-Dichloroethane																		
2-Butanone																		
1,1,1-Trichloroethane																		
Carbon Tetrachloride																		
Vinyl Acetate																		
Bromodichloromethane																		

CRDL = Contract Required Detection Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: V O L A T I L E S 1

SOIL SAMPLES (ug/Kg)

Site Name: 97th St Methodist Church

Case #: 1044.001, 1044.002, 1044.004

Sampling Date(s): 11/29/89, 11/30/89, 12/4/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

Sample No.	SS-5MS		SS-5MSD		SS-7		SS-8											
Dilution Factor	1.0		1.0		1.0		1.0											
% Moisture	26%		26%		14		20											
Location																		
COMPOUND																		
Chloromethane																		
Bromomethane																		
Vinyl Chloride																		
Chloroethane																		
Methylene Chloride	5	BJ	5	BJ	12	B	13	B										
Acetone	24	B	20	B	76	B	52	B										
Carbon Disulfide																		
1,1-Dichloroethene																		
1,1-Dichloroethane																		
Total-1,2-Dichloroethene																		
Chloroform																		
1,2-Dichloroethane																		
2-Butanone																		
1,1,1-Trichloroethane																		
Carbon Tetrachloride																		
Vinyl Acetate																		
Bromodichloromethane																		

CRDL Contract Required Detection Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: V O L A T I L E S 1

SOIL SAMPLES
(ug/Kg)

Site Name: 97th Street Methodist Church

Case #: 1044-005 Sampling Date(s): 12/18/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

Sample No.	TP-1		TP-2		TP-3		TP-2MS		TP-2MSD									
Dilution Factor	1.0		1.0				1.0		1.0									
% Moisture	19%		16%				16%		16%									
Location					NOT Run on Concrete Fragment													
COMPOUND																		
Chloromethane																		
Bromomethane																		
Vinyl Chloride																		
Chloroethane																		
Methylene Chloride	8	B	10	B			10	B	9	B								
Acetone	55		78				86		55									
Carbon Disulfide																		
1,1-Dichloroethene																		
1,1-Dichloroethane																		
Total-1,2-Dichloroethene																		
Chloroform	2	BJ	3	BJ			3	BJ	2	BJ								
1,2-Dichloroethane																		
2-Butanone																		
1,1,1-Trichloroethane																		
Carbon Tetrachloride																		
Vinyl Acetate																		
Bromodichloromethane																		

DL Contract Required Detection Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: 97th St Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044.001
1044.002

Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	GW-3155	GW-3159	GW-3257	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Sample No.	GW-3155	GW-3159	GW-3257	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
% Moisture	19%	16%	17%	30%	28%	28%	28%	26%	30%
Location									
COMPOUND									
1,2-Dichloropropane									
Cis-1,3-Dichloropropene									
Trichloroethene			19						
Dibromochloromethane									
1,1,2-Trichloroethane									
Benzene									
Trans-1,3-Dichloropropene									
Bromoform									
4-Methyl-2-pentanone									
2-Hexanone									
Tetrachloroethene			4 J						
1,1,2,2-Tetrachloroethane			14						
Toluene									
Chlorobenzene									
Ethylbenzene									
Styrene									
Total Xylenes									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: 97th St Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044.001 1044.002 1044.004 Sampling Date(s): 11/29/89, 11/30/89 12/4/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

Sample No.	SS-SMS	SS-SMSD	SS-7	SS-8					
Dilution Factor	1.0	1.0	1.0	1.0					
% Moisture	26%	26%	14	20					
Location									
COMPOUND									
1,2-Dichloropropane									
Cis-1,3-Dichloropropene									
Trichloroethene									
Dibromochloromethane									
1,1,2-Trichloroethane									
Benzene									
Trans-1,3-Dichloropropene									
Bromoform									
4-Methyl-2-pentanone									
2-Hexanone									
Tetrachloroethene									
1,1,2,2-Tetrachloroethane									
Toluene									
Chlorobenzene									
Ethylbenzene									
Styrene									
Total Xylenes									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: V O L A T I L E S 2

SOIL SAMPLES (ug/Kg)

Site Name: 97th Street Methodist Church

Case #: 1044.005 Sampling Date(s): 12/18/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

F-15

QL	Sample No.	TP-1	TP-2	TP-3	TP-2MS	TP-2MSD				
	Dilution Factor	1.0	1.0		1.0	1.0				
	% Moisture	19%	16%		16%	16%				
	Location			NOT RUN ON Concrete Fragment						
	COMPOUND									
	1,2-Dichloropropane									
	Cis-1,3-Dichloropropene									
	Trichloroethene									
	Dibromochloromethane									
	1,1,2-Trichloroethane									
	Benzene									
	Trans-1,3-Dichloropropene									
	Bromoform									
0	4-Methyl-2-pentanone									
0	2-Hexanone									
	Tetrachloroethene									
	1,1,2,2-Tetrachloroethane									
	Toluene									
	Chlorobenzene									
	Ethylbenzene									
	Styrene									
	Total Xylenes									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: TENTATIVELY INDENTIFIED COMPOUNDS

Site Name: 97th St. Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044.001 / 1044.002 Sampling Date: 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((1 - % moisture/100)

CRQL	Sample No.	GW-3155		GW-3159		GW-3257		SS-1		SS-2		SS-3		SS-4		SS-5		SS-6	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	19%		16%		17%		30%		28%		28%		28%		26%		30%	
	Location																		
	COMPOUND CAS No.																		
	Hexane, 110543	8.3	BJ	11	BJ	11	BJ	14	BJ	15	BJ	16	BJ	17	BJ	12	BJ	11	BJ

CRQL = Contract Required Quantitation Limit

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ecology and environment

DATA SUMMARY FORM: TENTATIVELY INDENTIFIED COMPOUNDS

Site Name: 97th St. Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044.001, 1044.002, 1044.004, 1044.005 Sampling Date: 11/29/89, 11/30/89, 12/4/89, 12/18/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((1 - % moisture/100)

Sample No.	SS-5MS		SS-5MSD		SS-7		SS-8		TP-1		TP-2		TP-3					
Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0							
% Moisture	26%		26%		14		20											
Location													Not Run on Concrete Fragment					
COMPOUND																		
Hexane CAS No. 110543					14	BJ	17	BJ	16	BJ	20	BJ						

CRQL = Contract Required Quantitation Limit

BNAs EXTRACTABLES

DATA SUMMARY FORM: B N A S 1

WATER SAMPLES
(ug/L)

Site Name: 97th St. Methodist Church

Case #: 9000.059 Sampling Date(s): 1/8/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

recycled paper

F-19

Sample No.	GW-3151	GW-3155	GW-3155RE	GW-3159	GW-3159RE	GW-3251	GW-3257	GW-3257MS	GW-3257M
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Location									
COMPOUND									
Phenol									
bis(2-Chloroethyl)ether									
2-Chlorophenol									
*1,3-Dichlorobenzene									
*1,4-Dichlorobenzene				4 J	4 J				
Benzyl Alcohol									
1,2-Dichlorobenzene									
2-Methylphenol									
bis(2-Chloroisopropyl)ether									
4-Methylphenol									
N-Nitroso-di-n-propylamine				5 J	4 J				
Hexachloroethane									
Nitrobenzene									
Isophorone									
2-Nitrophenol									
2,4-Dimethylphenol									
Benzoic Acid									
bis(2-Chloroethoxy)methane									
2,4-Dichlorophenol									
1,2,4-Trichlorobenzene				4 J	3 J				
Naphthalene									
4-Chloroaniline									

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 1

WATER SAMPLES
(ug/L)

Site Name: 97th St. Methodist Church

Case #: 1044-004 9000.090 Sampling Date(s): 12/4/90 1/10/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

Sample No.	GW-3157	GW-3357-DW							
Dilution Factor	1.0	1.0							
Location									
COMPOUND									
Phenol									
bis(2-Chloroethyl)ether									
2-Chlorophenol									
*1,3-Dichlorobenzene									
*1,4-Dichlorobenzene									
Benzyl Alcohol									
1,2-Dichlorobenzene									
2-Methylphenol									
bis(2-Chloroisopropyl)ether									
4-Methylphenol									
N-Nitroso-di-n-propylamine									
Hexachloroethane									
Nitrobenzene									
Isophorone									
2-Nitrophenol									
2,4-Dimethylphenol									
Benzoic Acid									
bis(2-Chloroethoxy)methane									
2,4-Dichlorophenol									
1,2,4-Trichlorobenzene									
Naphthalene									
4-Chloroaniline									

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 2

WATER SAMPLES
(ug/L)

Site Name: 97th St. Methodist Church

Case #: 9000.059 Sampling Date(s): 1/8/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

RQL	Sample No.	GW-3151	GW-3155	GW-3155RE	GW-3159	GW-3159RE	GW-3251	GW-3257	GW-3257MS	GW-3257MSD
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location									
	COMPOUND									
10	Hexachlorobutadiene									
10	4-Chloro-3-methylphenol									
10	2-Methylnaphthalene									
10	Hexachlorocyclopentadiene									
10	2,4,6-Trichlorophenol									
50	2,4,5-Trichlorophenol									
10	2-Chloronaphthalene									
50	2-Nitroaniline									
10	Dimethylphthalate									
10	Acenaphthylene									
10	2,6-Dinitrotoluene									
50	3-Nitroaniline									
10	Acenaphthene				5 J	5 J				
50	2,4-Dinitrophenol									
50	4-Nitrophenol									
10	Dibenzofuran									
10	2,4-Dinitrotoluene				2 J	2 J				
10	Diethylphthalate									
10	4-Chlorophenyl-phenylether									
10	Fluorene									
50	4-Nitroaniline									
50	4,6-Dinitro-2-methylphenol									

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 2

WATER SAMPLES
(ug/L)

Site Name: 97th St. Methodist Church
1044.004
Case #: 9000.090 Sampling Date(s): 12/4/90 1/10/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

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F-22

CRQL	Sample No.	GW-3157	GW-3157-DW						
	Dilution Factor	1.0	1.0						
	Location								
	COMPOUND								
10	Hexachlorobutadiene								
10	4-Chloro-3-methylphenol								
0	2-Methylnaphthalene								
0	Hexachlorocyclopentadiene								
10	2,4,6-Trichlorophenol								
50	2,4,5-Trichlorophenol								
10	2-Chloronaphthalene								
50	2-Nitroaniline								
10	Dimethylphthalate								
10	Acenaphthylene								
10	2,6-Dinitrotoluene								
50	3-Nitroaniline								
10	Acenaphthene								
50	2,4-Dinitrophenol								
50	4-Nitrophenol								
0	Dibenzofuran								
0	2,4-Dinitrotoluene								
0	Diethylphthalate								
0	4-Chlorophenyl-phenylether								
0	Fluorene								
0	4-Nitroaniline								
0	4,6-Dinitro-2-methylphenol								

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 3

Site Name: 97th St. Methodist Church

WATER SAMPLES
(ug/L)

Case #: 9000.059 Sampling Date(s): 1/8/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

F-23

Sample No.	GW-3151	GW-3155	GW-3155RE	GW-3159	GW-3159RE	GW-3251	GW-3257	GW-3257MS	GW-3257M
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Location									
COMPOUND									
N-Nitrosodiphenylamine									
4-Bromophenyl-phenylether									
*Hexachlorobenzene									
*Pentachlorophenol									
Phenanthrene									
Anthracene									
Di-n-butylphthalate									
Fluoranthene									2 J
Pyrene				4 J	5 J				
Butylbenzylphthalate									
3,3-Dichlorobenzidine									
Benzo(a)anthracene									
Chrysene									
bis(2-Ethylhexyl)phthalate	7 BJ	8 BJ	9 J	23 B	26	8 BJ	12 B	6 BJ	8 BJ
Di-n-octylphthalate									
Benzo(b)fluoranthene									
Benzo(k)fluoranthene									
Benzo(a)pyrene									
Indeno(1,2,3-cd)pyrene									
Dibenz(a,h)anthracene									
Benzo(g,h,i)perylene									

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: B N A S 3

WATER SAMPLES
(ug/L)

te Name: 97th St. Methodist Church

se #: 9000.090 Sampling Date(s): 12/4/90 1/10/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

Sample No.	GW-3157		GW-3157-DW													
Dilution Factor	1.0		1.0													
Location																
COMPOUND																
N-Nitrosodiphenylamine																
4-Bromophenyl-phenylether																
*Hexachlorobenzene																
*Pentachlorophenol																
Phenanthrene																
Anthracene																
Di-n-butylphthalate	8	BJ	3	BJ												
Fluoranthene																
Pyrene																
Butylbenzylphthalate																
3,3-Dichlorobenzidine																
Benzo(a)anthracene																
Chrysene																
bis(2-Ethylhexyl)phthalate	53	B	20	B												
Di-n-octylphthalate																
Benzo(b)fluoranthene																
Benzo(k)fluoranthene																
Benzo(a)pyrene																
Indeno(1,2,3-cd)pyrene																
Dibenz(a,h)anthracene																
Benzo(g,h,i)perylene																

DL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 1

SOIL SAMPLES
(ug/Kg)

Site Name: 97th St. Methodist Church

Case #: 1044.001 1044.002 Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

QL	Sample No.	GW-3155	GW-3159	GW-3257	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
	Dilution Factor	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% Moisture	19%	16%	17%	30%	28%	28%	28%	26%	30%
	Location	2-4'	2-4'	2-4'						
	COMPOUND									
30	Phenol									
30	bis(2-Chloroethyl)ether									
30	2-Chlorophenol									
30	1,3-Dichlorobenzene									
30	1,4-Dichlorobenzene									
30	Benzyl Alcohol									
30	1,2-Dichlorobenzene									
30	2-Methylphenol									
30	bis(2-Chloroisopropyl)ether									
30	4-Methylphenol									
30	N-Nitroso-di-n-propylamine									
30	Hexachloroethane									
10	Nitrobenzene									
10	Isophorone				70 J			370 J		
10	2-Nitrophenol									
0	2,4-Dimethylphenol									
00	Benzoic Acid									
0	bis(2-Chloroethoxy)methane									
0	2,4-Dichlorophenol									
0	1,2,4-Trichlorobenzene									
0	Naphthalene									
0	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 1

Site Name: 97th St. Methodist Church

SOIL SAMPLES (ug/Kg)

Case #: 1044.001 1044.002 1044.003 **Sampling Date(s):** 11/29/89 11/30/89 12/4/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

recycled paper

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	Sample No.	SS-5MS	SS-5MSD	SS-7	SS-8	SS-8MS	SS-8MSD			
	Dilution Factor	2.0	2.0	2.0	2.0	2.0	2.0			
	% Moisture	26%	26%	14	20	20	20			
	Location									
QL	COMPOUND									
30	Phenol									
30	bis(2-Chloroethyl)ether									
30	2-Chlorophenol									
30	1,3-Dichlorobenzene									
30	1,4-Dichlorobenzene				170 J					
30	Benzyl Alcohol									
30	1,2-Dichlorobenzene				240 J					
30	2-Methylphenol									
30	bis(2-Chloroisopropyl)ether									
30	4-Methylphenol									
30	N-Nitroso-di-n-propylamine									
30	Hexachloroethane									
30	Nitrobenzene									
30	Isophorone									
30	2-Nitrophenol									
30	2,4-Dimethylphenol									
600	Benzoic Acid									
30	bis(2-Chloroethoxy)methane									
30	2,4-Dichlorophenol									
30	1,2,4-Trichlorobenzene				310 J					
30	Naphthalene									
30	4-Chloroaniline									

ecology and environment

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 1

Site Name: 97th Street Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044.005 Sampling Date(s): 12/18/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

RQL	Sample No.	TP-1	TP-2	TP-3		TP-1MS	TP-1MSD			
	Dilution Factor	2.0	2.0			2.0	2.0			
	% Moisture	19%	16%			19%	19%			
	Location			NOT RUN on Concrete Fragment						
	COMPOUND									
330	Phenol									
330	bis(2-Chloroethyl)ether									
330	2-Chlorophenol									
330	1,3-Dichlorobenzene									
330	1,4-Dichlorobenzene									
330	Benzyl Alcohol									
330	1,2-Dichlorobenzene									
330	2-Methylphenol									
330	bis(2-Chloroisopropyl)ether									
330	4-Methylphenol									
330	N-Nitroso-di-n-propylamine									
330	Hexachloroethane									
330	Nitrobenzene									
330	Isophorone									
330	2-Nitrophenol									
330	2,4-Dimethylphenol									
1600	Benzoic Acid									
330	bis(2-Chloroethoxy)methane									
330	2,4-Dichlorophenol									
330	1,2,4-Trichlorobenzene									
330	Naphthalene									
330	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 2

Site Name: 97th Street Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044.001 1044.002 . Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

recycled paper

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Sample No.	GW-3155	GW-3159	GW-3257	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Dilution Factor	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
% Moisture	19%	16%	17%	30%	28%	28%	28%	26%	30%
Location									
COMPOUND									
Hexachlorobutadiene									
4-Chloro-3-methylphenol									
2-Methylnaphthalene									
Hexachlorocyclopentadiene									
2,4,6-Trichlorophenol									
2,4,5-Trichlorophenol									
2-Chloronaphthalene									
2-Nitroaniline									
Dimethylphthalate									
Acenaphthylene									
2,6-Dinitrotoluene									
3-Nitroaniline									
Acenaphthene									110 J
2,4-Dinitrophenol									
4-Nitrophenol									
Dibenzofuran									59 J
2,4-Dinitrotoluene									
Diethylphthalate									
4-Chlorophenyl-phenylether									
Fluorene									140 J
4-Nitroaniline									
4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 2

Site Name: 97th Street Methodist Church

SOIL SAMPLES (ug/Kg)

10.44.003 12/4/90

Case #: 1044.001 1044.002 Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit: (CRQL * Dilution Factor) / ((100 - % moisture)/100

recycled paper

F-29

	Sample No.	SS-5MS	SS-5MSD	SS-7	SS-8	SS-8MS	SS-8MSD			
	Dilution Factor	2-0	2-0	2.0	2.0	2.0	2-0			
	% Moisture	26%	26%	14	20	20	20			
	Location									
QL	COMPOUND									
30	Hexachlorobutadiene									
30	4-Chloro-3-methylphenol									
30	2-Methylnaphthalene									
30	Hexachlorocyclopentadiene									
30	2,4,6-Trichlorophenol									
500	2,4,5-Trichlorophenol									
30	2-Chloronaphthalene									
500	2-Nitroaniline									
30	Dimethylphthalate									
30	Acenaphthylene			48 J						
30	2,6-Dinitrotoluene									
500	3-Nitroaniline									
30	Acenaphthene									
500	2,4-Dinitrophenol									
500	4-Nitrophenol									
30	Dibenzofuran									
30	2,4-Dinitrotoluene									
30	Diethylphthalate									
30	4-Chlorophenyl-phenylether									
30	Fluorene									
500	4-Nitroaniline									
500	4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 2

SOIL SAMPLES (ug/Kg)

Site Name: 97th Street Methodist Church

Case #: 1044.005 Sampling Date(s): 12/18/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

recycled paper

F-30

...L	Sample No.	TP-1	TP-2	TP-3		TP-1MS	TP-1MSD			
	Dilution Factor	2.0	2.0			2.0	2.0			
	% Moisture	19%	16%			19%	19%			
	Location			NOT RUN ON Concrete Fragment						
	COMPOUND									
0	Hexachlorobutadiene									
0	4-Chloro-3-methylphenol									
0	2-Methylnaphthalene									
0	Hexachlorocyclopentadiene									
0	2,4,6-Trichlorophenol									
00	2,4,5-Trichlorophenol									
0	2-Chloronaphthalene									
00	2-Nitroaniline									
0	Dimethylphthalate									
0	Acenaphthylene									
0	2,6-Dinitrotoluene									
00	3-Nitroaniline									
0	Acenaphthene									
00	2,4-Dinitrophenol									
00	4-Nitrophenol									
0	Dibenzofuran									
0	2,4-Dinitrotoluene									
0	Diethylphthalate									
0	4-Chlorophenyl-phenylether									
0	Fluorene									
00	4-Nitroaniline									
00	4,6-Dinitro-2-methylphenol									

ecology and environment

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 3

Site Name: 97th Street Methodist Church

SOIL SAMPLES (ug/Kg)

Case #: 1044.001 / 1044.002 Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

CRQL	Sample No.	GW-3155	GW-3159	GW-3257	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
	Dilution Factor	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% Moisture	19%	16%	17%	30%	28%	28%	28%	26%	30%
	Location									
	COMPOUND									
330	N-Nitrosodiphenylamine									
330	4-Bromophenyl-phenylether									
330	Hexachlorobenzene									
1600	Pentachlorophenol									
330	Phenanthrene				170 J	100 J	290 J	65 J		2200
330	Anthracene									390 J
330	Di-n-butylphthalate	490 BJ	280 BJ		270 BJ	190 BJ	950 B	450 BJ	180 BJ	110 BJ
330	Fluoranthene				320 J	180 J	350 J	94 J		3000
330	Pyrene				230 J	140 J	290 J	88 J		4300
330	Butylbenzylphthalate									
1600	3,3-Dichlorobenzidine									
330	Benzo(a)anthracene				140 J	92 J	120 J			1300
330	Chrysene				220 J	160 J	210 J			1800
330	bis(2-Ethylhexyl)phthalate	520 BJ	900 B	1100 B	890 BJ	630 BJ	720 BJ	790 BJ	270 BJ	870 BJ
330	Di-n-octylphthalate									
330	Benzo(b)fluoranthene				380 J	510 J	240 J	950		2800
330	Benzo(k)fluoranthene									
330	Benzo(a)pyrene				110 J	120 J	130 J			1400
330	Indeno(1,2,3-cd)pyrene				160 J	140 J	84 J			1100
330	Dibenz(a,h)anthracene									240 J
330	Benzo(g,h,i)perylene				140 J	150 J	82 J			970

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 3

Site Name: 97 th Street Methodist Church 12/4/90

SOIL SAMPLES
(ug/Kg)

Case #: 1044.003 1044.001 1044.002 Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	SS-5MS		SS-5MSD		SS-7		SS-8		SS-8MS		SS-8MSD							
	Dilution Factor	2.0		2.0		2.0		2.0		2.0		2.0							
	% Moisture	26%		26%															
	Location																		
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl-phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene					410	J	150	J	400	J	650	J						
330	Anthracene					47	J			48	J	73	J						
330	Di-n-butylphthalate	250	BJ	330	BJ	140	BJ	63	BJ	70	J	140	J						
330	Fluoranthene					500	J	280	J	780	J	1000							
330	Pyrene					410	J	240	J										
330	Butylbenzylphthalate																		
1600	3,3-Dichlorobenzidine																		
330	Benzo(a)anthracene					130	J	94	J	260	J	320	J						
330	Chrysene					170	J	160	J	350	J	470	J						
330	bis(2-Ethylhexyl)phthalate	500	BJ	1200	B	990	B	930	B	800	BJ	1200	J						
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene					250	J	200	J	490	J	590	J						
330	Benzo(k)fluoranthene																		
330	Benzo(a)pyrene					150	J	110	J	310	J	350	J						
330	Indeno(1,2,3-cd)pyrene					120	J	100	J	260	J	300	J						
330	Dibenz(a,h)anthracene																		
330	Benzo(g,h,i)perylene					120	J	100	J	240	J	260	J						

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 3

Site Name: 97th Street Methodist Church

Case #: 1044.005 Sampling Date(s): 12/18/89

SOIL SAMPLES
(ug/Kg)

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

CRQL	COMPOUND	TP-1		TP-2		TP-3				TP-1MS		TP-1MSD							
	Dilution Factor	2.0		2.0						2.0		2.0							
	% Moisture	19%		16%						19%		19%							
	Location					NOT Run on Concrete Fragment													
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl-phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene									470	J	48	J						
330	Anthracene									70	J								
330	Di-n-butylphthalate			960	B					210	J	200	J						
330	Fluoranthene	57	J							700	J	88	J						
330	Pyrene	48	J																
330	Butylbenzylphthalate																		
1600	3,3-Dichlorobenzidine																		
330	Benzo(a)anthracene									230	J								
330	Chrysene									330	J								
330	bis(2-Ethylhexyl)phthalate	670	BJ	1900	B					530	J	580	J						
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene									360	J								
330	Benzo(k)fluoranthene									-									
330	Benzo(a)pyrene									200	J								
330	Indeno(1,2,3-cd)pyrene									120	J								
330	Dibenz(a,h)anthracene																		
330	Benzo(g,h,i)perylene									120	J								

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: TENTATIVELY INDENTIFIED COMPOUNDS

Site Name: 97th Street Methodist Church

Case #: 1044.001 / 1044.002 Sampling Date: 11/29/89, 11/30/89

SOIL SAMPLES
(ug/Kg)

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((1 - % moisture/100)

CRQL	Sample No.	GW-3155		GW-3159		GW-3257		SS-1		SS-2		SS-3		SS-4		SS-5		SS-6	
	Dilution Factor	2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0	
	% Moisture	19%		16%		17%		30%		28%		28%		28%		26%		30%	
	Location																		
	COMPOUND																		
	Decamethylcyclopentasiloxane Case No 54102									510	J								

CRQL = Contract Required Quantitation Limit

recycled paper

ecology and environment

DATA SUMMARY FORM: TENTATIVELY INDENTIFIED COMPOUNDS

SOIL SAMPLES
(ug/Kg)

Site Name: 97th St. Methodist Church

Case #: 1044.001 / 1044.002 Sampling Date: 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((1 - % moisture/100)

	Sample No.	SS-5MS	SS-5MSD						
	Dilution Factor	1.0	1.0						
	% Moisture	26%	26%						
	Location								
RQL	COMPOUND								

CRQL = Contract Required Quantitation Limit

recycled paper
ecology and environment

PESTICIDES AND PCBs

DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: 97th St. Methodist Church
1044-003

Case #: 9000.059
9000.090

Sampling Date(s): 12/4/89
1/8/90
1/10/90

WATER SAMPLES
(ug/L)

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

recycled paper

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CRQL	Sample No.	GW-3151	GW-3155	GW-3159	GW-3251	GW-3257	GW-3257MS	GW 3257MSD	GW-3157	GW-3157-DW
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location									
	COMPOUND									
0.05	alpha-BHC									
0.05	beta-BHC									
0.05	delta-BHC									
0.05	*Gamma-BHC (Lindane)									
0.05	*Heptachlor									
0.05	Aldrin									
0.05	Heptachlor Epoxide									
0.05	Endosulfan I									
0.10	Dieldrin									
0.10	4,4'-DDE									
0.10	*Endrin									
0.10	Endosulfan II									
0.10	4,4'-DDD									
0.10	Endosulfan Sulfate									
0.10	4,4'-DDT									
0.5	*Methoxychlor									
0.10	Endrin ketone									
0.5	*Alpha-Chlordane									
0.5	*Gamma-Chlordane									
1.0	*Toxaphene									
0.5	*Aroclor-1016									
0.5	*Aroclor-1221									
0.5	*Aroclor-1232									
0.5	*Aroclor-1242									
0.5	*Aroclor-1248									
1.0	*Aroclor-1254									
1.0	*Aroclor-1260									

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: 97th St. Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044-001
1044-002

Sampling Date(s): 11/29/89, 11/30/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

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CRQL	Sample No.	GW-3155	GW-3159	GW-3257	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	% Moisture	19%	16%	17%	30%	28%	28%	28%	26%	30%
	Location									
CRQL	COMPOUND									
8	alpha-BHC									
8	beta-BHC									
8	delta-BHC									
8	Gamma-BHC (Lindane)									
8	Heptachlor									
8	Aldrin									
8	Heptachlor Epoxide									
8	Endosulfan I									
16	Dieldrin									
16	4,4'-DDE									
16	Endrin									
16	Endosulfan II									
16	4,4'-DDD									
16	Endosulfan Sulfate									
16	4,4'-DDT									
80	Methoxychlor									
16	Endrin ketone									
80	Alpha-Chlordane									
80	Gamma-Chlordane									
160	Toxaphene									
80	Aroclor-1016									
80	Aroclor-1221									
80	Aroclor-1232									
80	Aroclor-1242									
80	Aroclor-1248									
160	Aroclor-1254									
160	Aroclor-1260									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: 97th St Methodist Church

SOIL SAMPLES
(ug/Kg)

Case #: 1044.001, 1044.002, 1044.003   Sampling Date(s): ~~11/29/89~~ 11/30/89 12/4/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

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CRQL	COMPOUND									
	Sample No.	SS-5MS	SS-5MSD	SS-7	SS-8					
	Dilution Factor	1.0	1.0							
	% Moisture	26%	26%							
	Location									
8	alpha-BHC									
8	beta-BHC									
8	delta-BHC									
8	Gamma-BHC (Lindane)									
8	Heptachlor									
8	Aldrin									
8	Heptachlor Epoxide									
8	Endosulfan I									
16	Dieldrin									
16	4,4'-DDE									
16	Endrin									
16	Endosulfan II									
16	4,4'-DDD									
16	Endosulfan Sulfate									
16	4,4'-DDT									
80	Methoxychlor									
16	Endrin ketone									
80	Alpha-Chlordane									
80	Gamma-Chlordane									
160	Toxaphene									
80	Aroclor-1016									
80	Aroclor-1221									
80	Aroclor-1232									
80	Aroclor-1242									
80	Aroclor-1248									
160	Aroclor-1254									
160	Aroclor-1260									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: P E S T I C I D E S A N D P C B S

Site Name: 97th Street Methodist Church

Case #: 1044.005 Sampling Date(s): 12/18/89

SOIL SAMPLES
(ug/Kg)

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

recycled paper

F-40

QL	Sample No.	TP-1	TP-2	TP-3	TP-1MS	TP-1MSD				
	Dilution Factor	1.0	1.0		1.0	1.0				
	% Moisture	19%	16%		19%	19%				
	Location			NOT RUN on Concrete Fragment						
	COMPOUND									
	alpha-BHC									
	beta-BHC									
	delta-BHC									
	Gamma-BHC (Lindane)									
	Heptachlor									
	Aldrin									
	Heptachlor Epoxide									
	Endosulfan I									
6	Dieldrin									
6	4,4'-DDE									
6	Endrin									
6	Endosulfan II									
6	4,4'-DDD									
6	Endosulfan Sulfate									
6	4,4'-DDT									
0	Methoxychlor									
6	Endrin ketone									
0	Alpha-Chlordane									
0	Gamma-Chlordane									
60	Toxaphene									
0	Aroclor-1016									
0	Aroclor-1221									
0	Aroclor-1232									
0	Aroclor-1242									
0	Aroclor-1248									
160	Aroclor-1254									
160	Aroclor-1260									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

METALS AND CYANIDE

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.
GW-3151

Lab Name: Ecology & Environment Inc.   Contract: D001549

Lab Code: ______   Case No.: 9000.090   SAS No.: Y0-7060   SDG No.: ______

Matrix (soil/water): WATER   Lab Sample ID: 61634.01

Level (low/med): LOW   Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4130		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	40.4	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	6.8			P
7440-70-2	Calcium	135000			P
7440-47-3	Chromium	33.0			P
7440-48-4	Cobalt	17.9	B		P
7440-50-8	Copper	29.6			P
7439-89-6	Iron	84700			P
7439-92-1	Lead	23.6			F
7439-95-4	Magnesium	142000			P
7439-96-5	Manganese	1030			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	5370			P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	69600			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	32.7	B		P
7440-66-6	Zinc	134			P
	Cyanide				NR

Color Before: BROWN   Clarity Before: CLOUDY   Texture: ______

Color After: YELLOW   Clarity After: CLOUDY   Artifacts: ______

Comments:

FORM I - IN

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NYSDEC SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

GW-3151
FILTERED

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: YO-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61634.02

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U	N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	10.0	U		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	85400			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	7420			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	132000			P
7439-96-5	Manganese	610			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	4850	B		P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	72400			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: CLEAR Clarity After: CLEAR Artifacts: ______

Comments:

FORM I - IN

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE N

GW-3151

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.059 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61302

Level (low/med): LOW Date Received: 1/8/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q ~~M~~	M ~~Q~~
7429-90-5	Aluminum				NR
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide	50.0	u		C

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.
GW-3251

ab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

.atrix (soil/water): WATER Lab Sample ID: 61635.01

evel (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7690		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.9			F
7440-39-3	Barium	95.1	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	254000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	17.7	B		P
7439-89-6	Iron	46000			P
7439-92-1	Lead	12.4			F
7439-95-4	Magnesium	40400			P
7439-96-5	Manganese	357			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	8850			P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	124000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	28.0	B		P
7440-66-6	Zinc	49.3			P
	Cyanide				NR

Color Before: BROWN Clarity Before: CLOUDY Texture: ______

Color After: YELLOW Clarity After: CLOUDY Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3251
FILTERED

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61635.02

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U	N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	41.3	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	784000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	85.0	B		P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	200	U		P
7439-96-5	Manganese	5.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	9090			P
7782-49-2	Selenium	5.0	U	N	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	123000			P
7440-28-0	Thallium	5.0	U		P
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: CLEAR Clarity After: CLEAR Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO

GW-3251

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.059 SAS No.: YD-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61299

Level (low/med): LOW Date Received: 1/8/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q ~~M~~	M ~~Q~~
7429-90-5	Aluminum				NR
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide	10.0	u		C

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3155

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61636.01

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6390		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	66.2	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	196000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	140	B		P
7439-89-6	Iron	10800			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	118000			P
7439-96-5	Manganese	367			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	6090			P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	46600			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	16.4	B		P
7440-66-6	Zinc	33.4			P
	Cyanide				NR

Color Before: BROWN Clarity Before: CLOUDY Texture: ______

Color After: YELLOW Clarity After: CLOUDY Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3155 FILTERED

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: YO-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61636.02

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U	N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	20.8	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	184000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	151			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	104000			P
7439-96-5	Manganese	683			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	4820	B		P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	43600			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: CLEAR Clarity After: CLEAR Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO

GW-3155

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.059 SAS No.: YD-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61306

Level (low/med): LOW Date Received: 1/8/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	~~M~~ Q	~~Q~~ M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide	10.0	u		C

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC SAMPLE NO.

GW-3157

1
INORGANIC ANALYSIS DATA SHEET

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61639.01

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1090		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	31.0	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	311000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	2150			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	112000			P
7439-96-5	Manganese	629			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	2710	B		P
7782-49-2	Selenium	5.0	U	W N	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	45200			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	20.4			P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLOUDY Texture: ______

Color After: CLEAR Clarity After: CLOUDY Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3157
FILTERED

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61639.02

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U	N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	16.2	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	310000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	804			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	118000			P
7439-96-5	Manganese	499			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	2460	B		P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	38500			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	24.9			P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: CLEAR Clarity After: CLEAR Artifacts: ______

Comments:

NYSDEC

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3157

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 9011.059 SAS No.: YD-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61303

Level (low/med): LOW Date Received: 1/8/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	~~M~~ Q	~~Q~~ M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide	10.0	U		C

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.
GW 3257-DW

Lab Name: Ecology & Environment Contract: D001549

Lab Code: ______ Case No.: 1044004 SAS No.: YD-7040 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 58693

Level (low/med): LOW Date Received: 12-5-89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/l

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	7.0	U		F
7440-39-3	Barium	18.3	B		P
7440-41-7	Beryllium	2.00	U		P
7440-43-9	Cadmium	5.00	U		P
7440-70-2	Calcium	32,700			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	123			P
7439-89-6	Iron	1580			P
7439-92-1	Lead	35.9			F
7439-95-4	Magnesium	7690			P
7439-96-5	Manganese	23.3			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	944	B		P
7782-49-2	Selenium	1.0	U	W	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	8,240			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	62.8			P
	Cyanide	10.0	U		C

Color Before: Clear Clarity Before: Clear Texture: ______

Color After: Clear Clarity After: Clear Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3257

a Name: Ecology & Environment Inc. Contract: D001549

ab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

a rix (soil/water): WATER Lab Sample ID: 61637.01

evel (low/med): LOW Date Received: 1/10/90

olids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5040		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	70.8	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	602000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	24.4	B		P
7439-89-6	Iron	11600			P
7439-92-1	Lead	34.8			F
7439-95-4	Magnesium	246000			P
7439-96-5	Manganese	436			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	8600			P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	87400			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	17.5	B		P
7440-66-6	Zinc	74.6			P
	Cyanide				NR

Co or Before: BROWN Clarity Before: CLOUDY Texture: ______

Co or After: YELLOW Clarity After: CLOUDY Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3257 FILTERED

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61637.02

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	~~X~~ Q	~~Q~~ M
7429-90-5	Aluminum	100	U	N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	19.0	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	446000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	1370			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	149000			P
7439-96-5	Manganese	40.8			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	6150			P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	77200			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: CLEAR Clarity After: CLEAR Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3257

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9010.059 SAS No.: YD-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61298

Level (low/med): LOW Date Received: 1/8/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q ~~M~~	M ~~Q~~
7429-90-5	Aluminum				NR
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide	10.0	u		C

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3159

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: YO-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61638.01

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8330		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	76.8	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	503000			P
7440-47-3	Chromium	16.0			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	17.2	B		P
7439-89-6	Iron	10900			P
7439-92-1	Lead	5.9			F
7439-95-4	Magnesium	209000			P
7439-96-5	Manganese	603			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	6570			P
7782-49-2	Selenium	25.0	U	EN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	91200			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	12.7	B		P
7440-66-6	Zinc	35.4			P
	Cyanide				NR

Color Before: BROWN Clarity Before: CLOUDY Texture: ______

Color After: YELLOW Clarity After: CLOUDY Artifacts: ______

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-3159
FILTERED

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9000.090 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61638.02

Level (low/med): LOW Date Received: 1/10/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	~~M~~ Q	~~Q~~ M
7429-90-5	Aluminum	100	U	N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	10.0	U		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	487000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	68.0	B		P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	216000			P
7439-96-5	Manganese	650			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	3640	B		P
7782-49-2	Selenium	25.0	U	WN	F
7440-22-4	Silver	10.0	U	N	P
7440-23-5	Sodium	94800			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: CLEAR Clarity After: CLEAR Artifacts: ______

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE N

GW-3159

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 9070.059 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 61301

Level (low/med): LOW Date Received: 1/8/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	~~M~~ Q	M ~~Q~~
7429-90-5	Aluminum				NR
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide	10.0	U		C

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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NYSDEC SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

CW-3155

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 1044.001 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58262

Level (low/med): LOW Date Received: 11/29/89

% Solids: 80.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	22500			P
7440-36-0	Antimony	14.8	U	N	P
7440-38-2	Arsenic	3.8			F
7440-39-3	Barium	111			P
7440-41-7	Beryllium	0.49	U		P
7440-43-9	Cadmium	3.3			P
7440-70-2	Calcium	2930			P
7440-47-3	Chromium	26.6			P
7440-48-4	Cobalt	9.8	B		P
7440-50-8	Copper	23.2			P
7439-89-6	Iron	33300			P
7439-92-1	Lead	8.2			F
7439-95-4	Magnesium	7480			P
7439-96-5	Manganese	225			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	25.6			P
7440-09-7	Potassium	2420			P
7782-49-2	Selenium	1.2	U	WN	F
7440-22-4	Silver	2.5	U	N	P
7440-23-5	Sodium	122	B		P
7440-28-0	Thallium	1.2	U		F
7440-62-2	Vanadium	39.3			P
7440-66-6	Zinc	74.7			P
	Cyanide	1.2	U		C

Color Before: ______ Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

1

NYSDEC SAMPLE NO.

GW-3257

INORGANIC ANALYSIS DATA SHEET

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.002 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58509

Level (low/med): LOW Date Received: 12/1/89

% Solids: 82.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	17400			P
7440-36-0	Antimony	14.5	U	N	P
7440-38-2	Arsenic	3.2			F
7440-39-3	Barium	171			P
7440-41-7	Beryllium	0.48	U		P
7440-43-9	Cadmium	5.0			P
7440-70-2	Calcium	2800			P
7440-47-3	Chromium	21.0			P
7440-48-4	Cobalt	71.7			P
7440-50-8	Copper	20.4			P
7439-89-6	Iron	37200			P
7439-92-1	Lead	4.7			F
7439-95-4	Magnesium	6290			P
7439-96-5	Manganese	2880			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	50.0			P
7440-09-7	Potassium	1650			P
7782-49-2	Selenium	1.2	U	WN	F
7440-22-4	Silver	2.4	U	N	P
7440-23-5	Sodium	217	B		P
7440-28-0	Thallium	1.2	U		F
7440-62-2	Vanadium	36.8			P
7440-66-6	Zinc	94.4			P
	Cyanide	1.2	U		C

Color Before: ______ Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW 3159

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.002 SAS No.: Y0.7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58511

Level (low/med): LOW Date Received: 12/1/89

% Solids: 84.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15200			P
7440-36-0	Antimony	14.2	U	N	P
7440-38-2	Arsenic	3.0			F
7440-39-3	Barium	85.9			P
7440-41-7	Beryllium	0.48	U		P
7440-43-9	Cadmium	3.4			P
7440-70-2	Calcium	2010			P
7440-47-3	Chromium	18.7			P
7440-48-4	Cobalt	11.8	B		P
7440-50-8	Copper	15.5			P
7439-89-6	Iron	30300			P
7439-92-1	Lead	5.5			F
7439-95-4	Magnesium	4510			P
7439-96-5	Manganese	414			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	20.3			P
7440-09-7	Potassium	1030	B		P
7782-49-2	Selenium	1.2	U	WN	F
7440-22-4	Silver	2.4	U	N	P
7440-23-5	Sodium	193	B		P
7440-28-0	Thallium	1.2	U		F
7440-62-2	Vanadium	28.7			P
7440-66-6	Zinc	74.9			P
	Cyanide	1.2	U		C

Color Before: ______ Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: SS-1

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 1044.001 SAS No.: YO-7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58253

Level (low/med): LOW Date Received: 11/29/89

% Solids: 70.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q ~~M~~	M ~~Q~~
7429-90-5	Aluminum	17300			P
7440-36-0	Antimony	17.1	U	N	P
7440-38-2	Arsenic	3.9			F
7440-39-3	Barium	119			P
7440-41-7	Beryllium	0.57	U		P
7440-43-9	Cadmium	3.5			P
7440-70-2	Calcium	22300			P
7440-47-3	Chromium	35.8			P
7440-48-4	Cobalt	10.2	B		P
7440-50-8	Copper	26.3			P
7439-89-6	Iron	24100			P
7439-92-1	Lead	36.1			F
7439-95-4	Magnesium	10800			P
7439-96-5	Manganese	421			P
7439-97-6	Mercury	0.38			CV
7440-02-0	Nickel	23.6			P
7440-09-7	Potassium	2750			P
7782-49-2	Selenium	1.4	U	WN	F
7440-22-4	Silver	2.8	U	N	P
7440-23-5	Sodium	219	B		P
7440-28-0	Thallium	1.4	U		F
7440-62-2	Vanadium	32.3			P
7440-66-6	Zinc	136			P
	Cyanide	1.4	U		C

Color Before: ______ Clarity Before: ______ Texture: FINE

Color After: ______ Clarity After: ______ Artifacts: ROOTS

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-2

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.001 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58254

Level (low/med): LOW Date Received: 11/29/89

% Solids: 71.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11400			P
7440-36-0	Antimony	16.7	U	N	P
7440-38-2	Arsenic	3.5			F
7440-39-3	Barium	73.6			P
7440-41-7	Beryllium	0.56	U		P
7440-43-9	Cadmium	3.6			P
7440-70-2	Calcium	18700			P
7440-47-3	Chromium	20.4			P
7440-48-4	Cobalt	7.8	B		P
7440-50-8	Copper	21.5			P
7439-89-6	Iron	19100			P
7439-92-1	Lead	31.4			F
7439-95-4	Magnesium	8320			P
7439-96-5	Manganese	379			P
7439-97-6	Mercury	0.18			CV
7440-02-0	Nickel	19.4			P
7440-09-7	Potassium	1630			P
7782-49-2	Selenium	1.4	U	WN	F
7440-22-4	Silver	2.8	U	N	P
7440-23-5	Sodium	180	B		P
7440-28-0	Thallium	1.4	U		F
7440-62-2	Vanadium	16.1			P
7440-66-6	Zinc	98.6			P
	Cyanide	1.4	U		C

Color Before: ______ Clarity Before: ______ Texture: FINE

Color After: ______ Clarity After: ______ Artifacts: ROOTS

Comments:

NYSDEC

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-3

Lab Name: Ecology & Environment Inc.   Contract: D001549

Lab Code: ______   Case No.: 1044.001   SAS No.: YD-7060   SDG No.: ______

Matrix (soil/water): SOIL   Lab Sample ID: 58255

Level (low/med): LOW   Date Received: 11/29/89

% Solids: 72.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q ~~M~~	M ~~Q~~
7429-90-5	Aluminum	12100			P
7440-36-0	Antimony	16.5	U	N	P
7440-38-2	Arsenic	4.2			F
7440-39-3	Barium	84.8			P
7440-41-7	Beryllium	0.55	U		P
7440-43-9	Cadmium	2.1			P
7440-70-2	Calcium	21300			P
7440-47-3	Chromium	22.0			P
7440-48-4	Cobalt	7.0	B		P
7440-50-8	Copper	21.6			P
7439-89-6	Iron	22700			P
7439-92-1	Lead	36.6			F
7439-95-4	Magnesium	9900			P
7439-96-5	Manganese	439			P
7439-97-6	Mercury	2.1			CV
7440-02-0	Nickel	21.4			P
7440-09-7	Potassium	1430			P
7782-49-2	Selenium	1.4	U	WN	F
7440-22-4	Silver	2.8	U	N	P
7440-23-5	Sodium	214	B		P
7440-28-0	Thallium	1.4	U		F
7440-62-2	Vanadium	25.4			P
7440-66-6	Zinc	107			P
	Cyanide	1.4	U		C

Color Before: ______   Clarity Before: ______   Texture: FINE

Color After: ______   Clarity After: ______   Artifacts: ROOTS

Comments:

NYSDEC

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-4

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 1044.001 SAS No.: YO-7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58256

Level (low/med): LOW Date Received: 11/29/89

% Solids: 71.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12700			P
7440-36-0	Antimony	16.7	U	N	P
7440-38-2	Arsenic	5.6			F
7440-39-3	Barium	83.0			P
7440-41-7	Beryllium	0.56	U		P
7440-43-9	Cadmium	2.2			P
7440-70-2	Calcium	20300			P
7440-47-3	Chromium	19.4			P
7440-48-4	Cobalt	9.0	B		P
7440-50-8	Copper	22.2			P
7439-89-6	Iron	24100			P
7439-92-1	Lead	41.3			F
7439-95-4	Magnesium	12700			P
7439-96-5	Manganese	501			P
7439-97-6	Mercury	2.8			CV
7440-02-0	Nickel	22.4			P
7440-09-7	Potassium	1370	B		P
7782-49-2	Selenium	1.4	U	WN	F
7440-22-4	Silver	2.8	U	N	P
7440-23-5	Sodium	223	B		P
7440-28-0	Thallium	1.4	U		F
7440-62-2	Vanadium	25.7			P
7440-66-6	Zinc	99.5			P
	Cyanide	1.4	U		C

Color Before: ______ Clarity Before: ______ Texture: FINE

Color After: ______ Clarity After: ______ Artifacts: ROOTS

Comments:

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INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-5

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.001 SAS No.: Y0-7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58258

Level (low/med): LOW Date Received: 11/29/89

% Solids: 73.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13500			P
7440-36-0	Antimony	16.3	U	N	P
7440-38-2	Arsenic	4.4			F
7440-39-3	Barium	82.4			P
7440-41-7	Beryllium	0.54	U		P
7440-43-9	Cadmium	1.4	U		P
7440-70-2	Calcium	6910			P
7440-47-3	Chromium	21.3			P
7440-48-4	Cobalt	9.3	B		P
7440-50-8	Copper	13.4			P
7439-89-6	Iron	22900			P
7439-92-1	Lead	31.8			F
7439-95-4	Magnesium	5820			P
7439-96-5	Manganese	503			P
7439-97-6	Mercury	0.14	U		CV
7440-02-0	Nickel	20.1			P
7440-09-7	Potassium	1560			P
7782-49-2	Selenium	1.4	U	WN	F
7440-22-4	Silver	2.7	U	N	P
7440-23-5	Sodium	183	B		P
7440-28-0	Thallium	1.4	U		F
7440-62-2	Vanadium	25.5			P
7440-66-6	Zinc	111			P
	Cyanide	1.4	U		C

Color Before: ______ Clarity Before: ______ Texture: FINE

Color After: ______ Clarity After: ______ Artifacts: ROOTS

Comments:

FORM I - IN

580

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-6

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 1044.001 SAS No.: YO-7060 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58259

Level (low/med): LOW Date Received: 11/29/89

% Solids: 70.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13200			P
7440-36-0	Antimony	17.1	U	N	P
7440-38-2	Arsenic	4.5			F
7440-39-3	Barium	90.0			P
7440-41-7	Beryllium	0.57	U		P
7440-43-9	Cadmium	2.5			P
7440-70-2	Calcium	24200			P
7440-47-3	Chromium	21.5			P
7440-48-4	Cobalt	8.7	B		P
7440-50-8	Copper	23.5			P
7439-89-6	Iron	21700			P
7439-92-1	Lead	41.4			F
7439-95-4	Magnesium	13300			P
7439-96-5	Manganese	576			P
7439-97-6	Mercury	0.19			CV
7440-02-0	Nickel	24.1			P
7440-09-7	Potassium	1770			P
7782-49-2	Selenium	1.4	U	N	F
7440-22-4	Silver	2.8	U	N	P
7440-23-5	Sodium	249	B		P
7440-28-0	Thallium	1.4	U		F
7440-62-2	Vanadium	25.5			P
7440-66-6	Zinc	143			P
	Cyanide	1.4	U		C

Color Before: ______ Clarity Before: ______ Texture: FINE

Color After: ______ Clarity After: ______ Artifacts: ROOTS

Comments:

FORM I - IN

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO. SS-7

ab Name: Ecology & ENVIRONMENT Contract: D001549

ab Code: ______ Case No.: 1044003 SAS No.: Y0-7040 SDG No.: ______

atrix (soil/water): Soil Lab Sample ID: 58565

evel (low/med): Low Date Received: 12-4-89

Solids: 86.0

Concentration Units (ug/L or mg/kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14300			P
7440-36-0	Antimony	13.9	U		P
7440-38-2	Arsenic	3.2			F
7440-39-3	Barium	72.2			P
7440-41-7	Beryllium	0.46	U		P
7440-43-9	Cadmium	3.40			P
7440-70-2	Calcium	10900			P
7440-47-3	Chromium	17.3			P
7440-48-4	Cobalt	40.5	B		P
7440-50-8	Copper	19.4			P
7439-89-6	Iron	28,500			P
7439-92-1	Lead	9.6			F
7439-95-4	Magnesium	6450			P
7439-96-5	Manganese	272			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	20.8			P
7440-09-7	Potassium	1010	B		P
7782-49-2	Selenium	0.23	U	W	F
7440-22-4	Silver	2.3	U		P
7440-23-5	Sodium	200	B		P
7440-28-0	Thallium	0.47	U		F
7440-62-2	Vanadium	27.1			P
7440-66-6	Zinc	69.2			P
	Cyanide	1.2	U		C

Color Before: ______ Clarity Before: ______ Texture: Clay

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-8

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.003 SAS No.: Y0-7040 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 58566

Level (low/med): LOW Date Received: 12/4/89

% Solids: 79.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14100			P
7440-36-0	Antimony	15.1	U		P
7440-38-2	Arsenic	3.2			F
7440-39-3	Barium	80.9			P
7440-41-7	Beryllium	0.50	U		P
7440-43-9	Cadmium	3.1			P
7440-70-2	Calcium	365000			P
7440-47-3	Chromium	18.2			P
7440-48-4	Cobalt	9.5	B		P
7440-50-8	Copper	18.1			P
7439-89-6	Iron	22100			P
7439-92-1	Lead	7.0			F
7439-95-4	Magnesium	12400			P
7439-96-5	Manganese	626			P
7439-97-6	Mercury	0.13	U		CV
7440-02-0	Nickel	21.5			P
7440-09-7	Potassium	2030			P
7782-49-2	Selenium	1.3	U	W	F
7440-22-4	Silver	2.5	U		P
7440-23-5	Sodium	340	B		P
7440-28-0	Thallium	0.50	U		F
7440-62-2	Vanadium	25.2			P
7440-66-6	Zinc	55.2			P
	Cyanide	1.3	U		C

Color Before: ______ Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

TP-1

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.005 SAS No.: Y0-7050 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 60465

Level (low/med): LOW Date Received: 12/18/89

% Solids: 80.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14600			P
7440-36-0	Antimony	14.9	U		P
7440-38-2	Arsenic	2.8			F
7440-39-3	Barium	71.2			P
7440-41-7	Beryllium	0.50	U		P
7440-43-9	Cadmium	2.6			P
7440-70-2	Calcium	32000			P
7440-47-3	Chromium	1190			P
7440-48-4	Cobalt	7.3	B		P
7440-50-8	Copper	19.9			P
7439-89-6	Iron	21800			P
7439-92-1	Lead	19.7			F
7439-95-4	Magnesium	9530			P
7439-96-5	Manganese	433			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	19.0			P
7440-09-7	Potassium	1040	B		P
7782-49-2	Selenium	0.25	U		F
7440-22-4	Silver	2.5	U		P
7440-23-5	Sodium	175	B		P
7440-28-0	Thallium	0.50	U		F
7440-62-2	Vanadium	41.1			P
7440-66-6	Zinc	85.8			P
	Cyanide	1.2	U		C

Color Before: ______ Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

TP-2

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.005 SAS No.: Y0-7050 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 60466

Level (low/med): LOW Date Received: 12/18/89

% Solids: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14400			P
7440-36-0	Antimony	14.3	U		P
7440-38-2	Arsenic	6.4			F
7440-39-3	Barium	68.5			P
7440-41-7	Beryllium	0.48	U		P
7440-43-9	Cadmium	2.9			P
7440-70-2	Calcium	2290			P
7440-47-3	Chromium	17.1			P
7440-48-4	Cobalt	9.0	B		P
7440-50-8	Copper	14.0			P
7439-89-6	Iron	29400			P
7439-92-1	Lead	13.1			F
7439-95-4	Magnesium	4460			P
7439-96-5	Manganese	208			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	21.4			P
7440-09-7	Potassium	1070	B		P
7782-49-2	Selenium	0.24	U		F
7440-22-4	Silver	2.4	U		P
7440-23-5	Sodium	145	B		P
7440-28-0	Thallium	0.48	U		F
7440-62-2	Vanadium	36.7			P
7440-66-6	Zinc	77.1			P
	Cyanide	1.2	U		C

Color Before: ______ Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

TP-3

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 1044.005 SAS No.: YO-7050 SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 60467

Level (low/med): LOW Date Received: 12/18/89

% Solids: ______

Concentration Units (ug/L or mg/kg ~~dry weight~~): MG/KG

CAS No.	Analyte	Concentration	C	Q ~~M~~	M ~~Q~~
7429-90-5	Aluminum				NR
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide				

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments: RESULTS REPORTED ON "AS RECEIVED" BASIS.
SAMPLE APPEARS TO BE CONCRETE BLOCK OR BRICK MATERIAL. % SOLID DETERMINATION COULD NOT BE MADE.

APPENDIX G

PHOTOGRAPHIC LOGS

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Minolta XG-1

SN: 7042661

Photographer: G. Florentino

Date/Time: 10/11/89 / 10:45

Lens: Type 50 mm

SN: 2792181

Frame No.: 12, Roll No. 1

Comments: View to northwest of southeast corner of site (Colvin Blvd. in foreground and 97th Street to right).

[UZ]YO7080:D2834, #3084

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Minolta XG-1

SN: 7042661

Photographer: G. Florentino

Date/Time: 10/11/89 / 10:46

Lens: Type 50 mm

SN: 2792181

Frame No.: 13, Roll No. 1

Comments: View to north of east side of site (97th Street to right)

[UZ]YO7080:D2834, #3084

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Minolta XG-1

SN: 7042661

Photographer: G. Florentino

Date/Time: 10/11/89 / 10:47

Lens: Type 50 mm

SN: 2792181

Frame No.: 14, Roll No. 1

Comments: View to west of south side of site (Colvin Blvd. to left and 97th Street in foreground).

[UZ]YO7080:D2834, #3084

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Minolta XG-1

SN: 7042661

Photographer: G. Florentino

Date/Time: 10/11/89 / 10:48

Lens: Type 50 mm

SN: 2792181

Frame No.: 15, Roll No. 1

Comments: View to west of north side of site (97th Street in foreground).

[UZ]YO7080:D2834, #3084

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Minolta XG-1

SN: 7042661

Photographer: G. Florentino

Date/Time: 10/11/89 / 10:49

Lens: Type 50 mm

SN: 2792181

Frame No.: 16, Roll No. 1

Comments: View to southwest of northeast corner of site (97th Street in foreground and existing monitoring wells to right of utility pole).

[UZ]YO7080:D2834, #3084

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Minolta XG-1

SN: 7042661

Photographer: G. Florentino

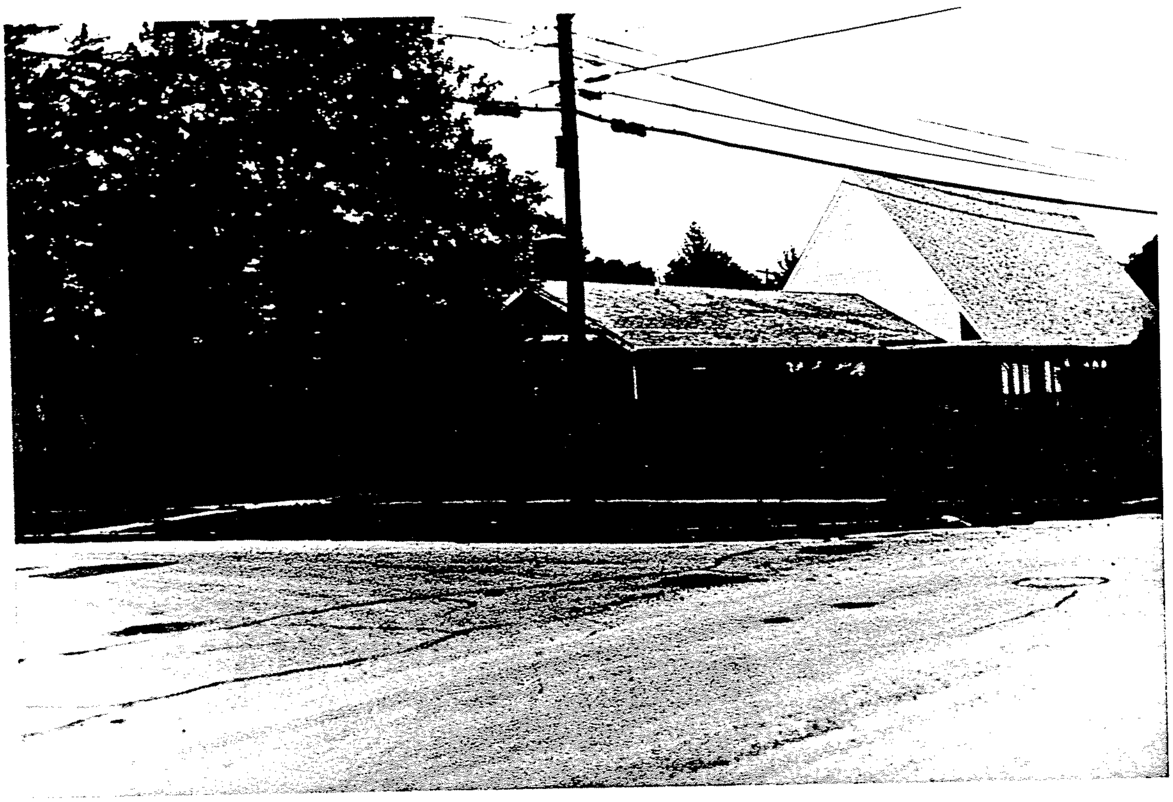
Date/Time: 10/11/89 / 10:51

Lens: Type 50 mm

SN: 2792181

Frame No.: 17, Roll No. 1

Comments: View to northeast of southwest corner of site (Colvin Blvd. in foreground and 96th Street to left).



[UZ]YO7080:D2834, #3084

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Minolta XG-1

SN: 7042661

Photographer: G. Florentino

Date/Time: 10/11/89 / 10:52

Lens: Type 50 mm

SN: 2792181

Frame No.: 18, Roll No. 1

Comments: View to north of west side of site (Colvin Blvd. in foreground and 96th Street to left).

[UZ]YO7080:D2834, #3084

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

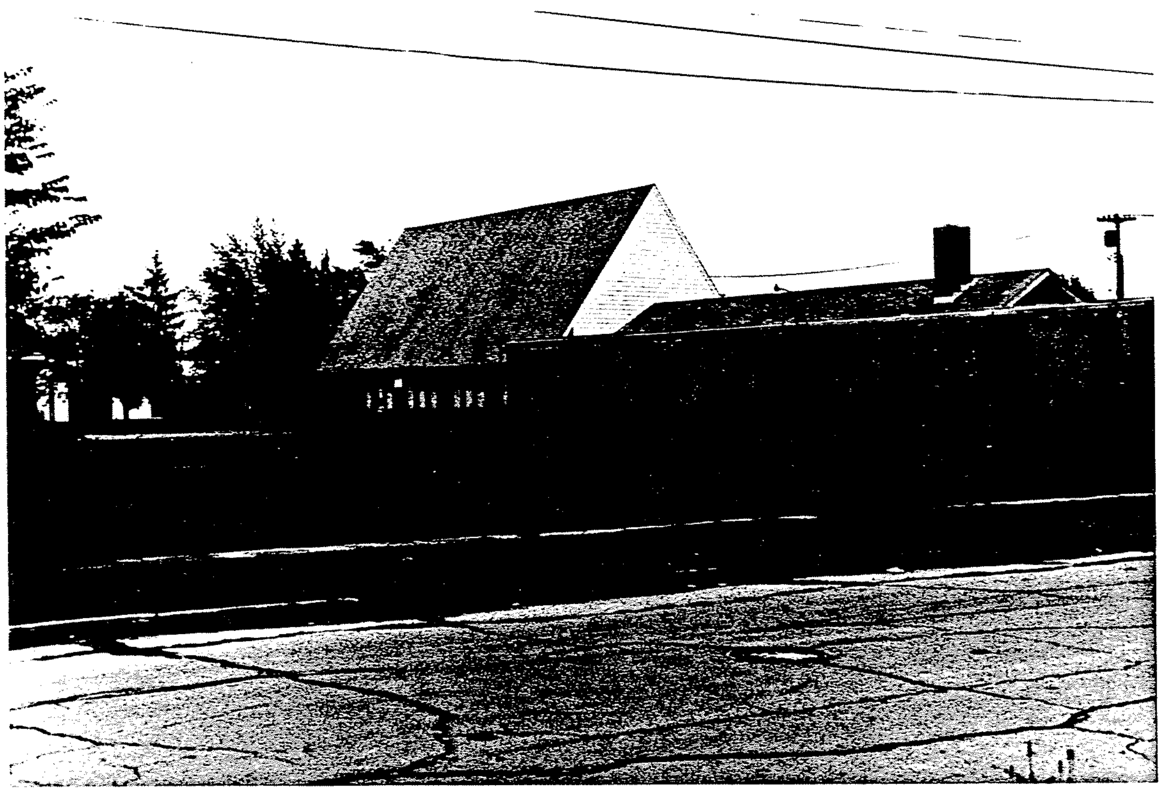
Client: NYSDEC E & E Job No.: YO-7000

Camera: Make Minolta XG-1 SN: 7042661

Photographer: G. Florentino Date/Time: 10/11/89 / 10:53

Lens: Type 50 mm SN: 2792181 Frame No.: 19, Roll No. 1

Comments: View to southeast of northwest corner of site (96th Street in foreground).



[UZ]YO7080:D2834, #3084

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 11/29/89 / 16:00

Lens: Type N/A

SN: N/A

Frame No.: 23, Roll No. 2

Comments: GW-3155 Split Spoon No.1 (0 - 2 feet).

[UZ]YO7080:D2834, #3086

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

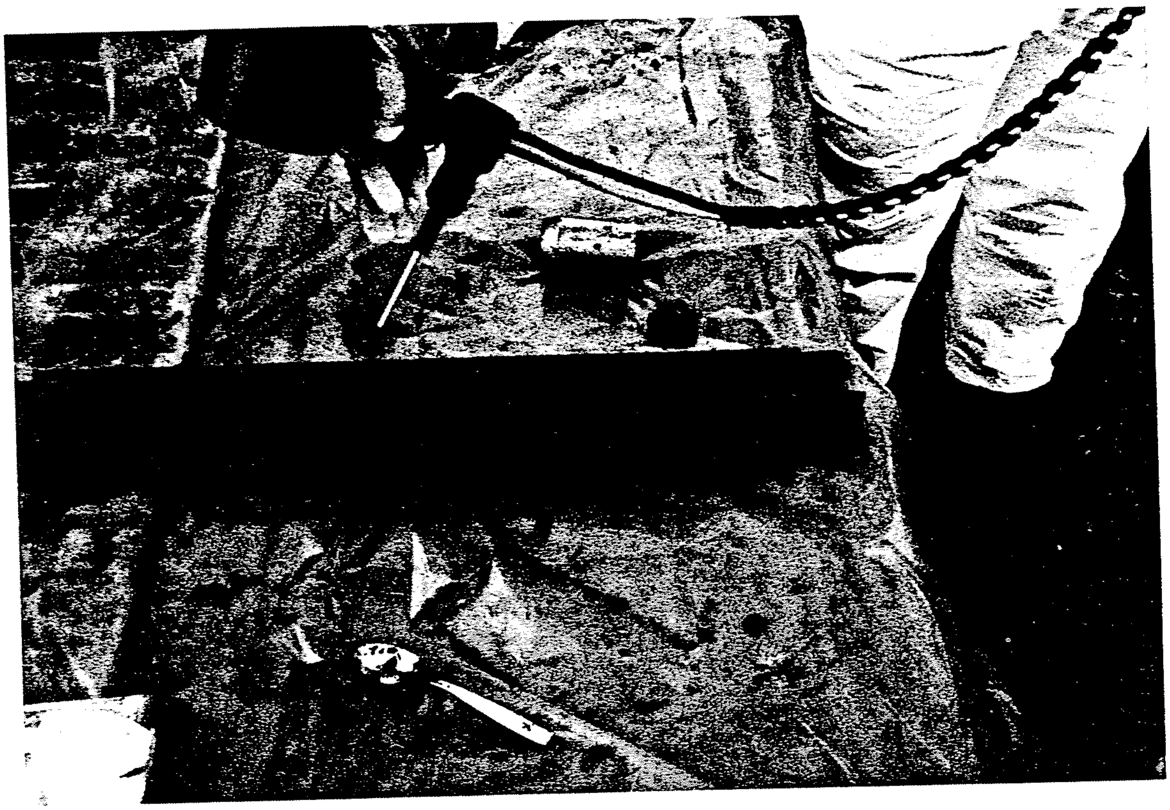
Date/Time: 11/29/89 / 16:15

Lens: Type N/A

SN: N/A

Frame No.: 22, Roll No. 2

Comments: GW-3155 Split Spoon No. 2 (2 - 4 feet).



[UZ]YO7080:D2834, #3086

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 11/29/89 / 16:25

Lens: Type N/A

SN: N/A

Frame No.: 21, Roll No. 2

Comments: GW-3155 Split Spoon No. 3 (4 - 6 feet).

[UZ]YO7080:D2834, #3086

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

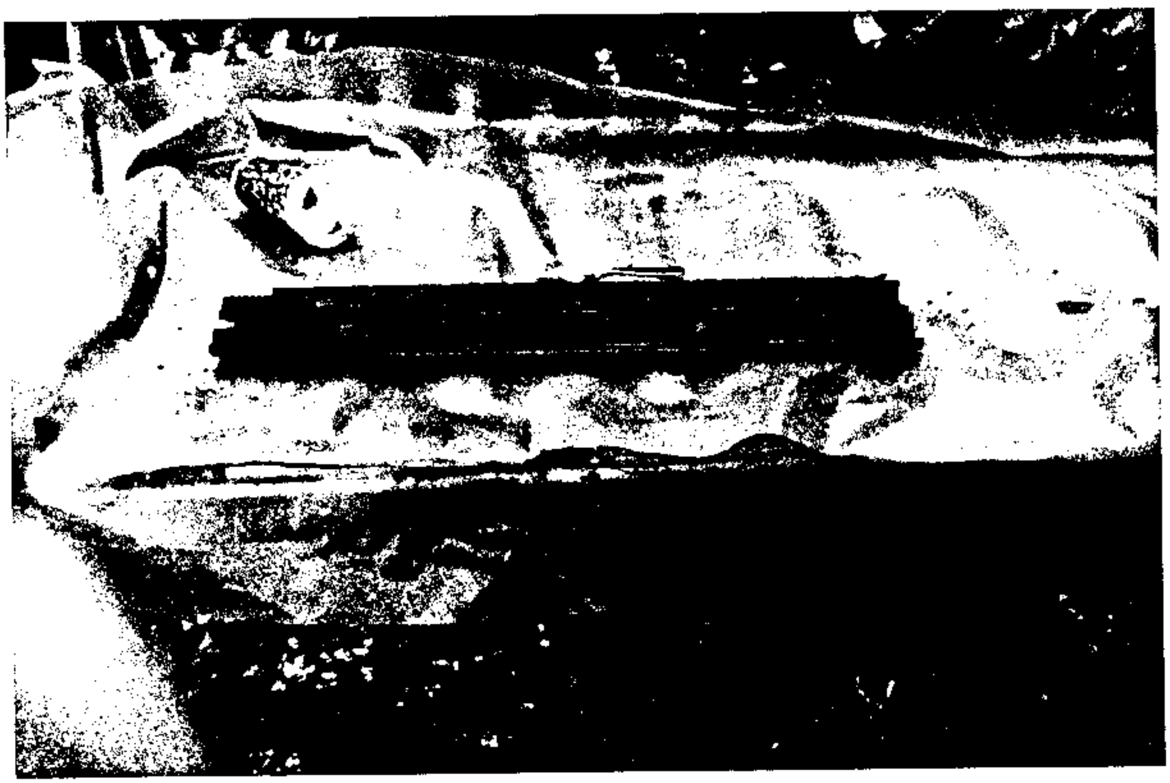
Date/Time: 11/29/89 / 16:40

Lens: Type N/A

SN: N/A

Frame No.: 19, Roll No. 2

Comments: GW-3155 Split Spoon No. 4 (6 - 8 feet).



[UZ]YO7080:D2834, #3086

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

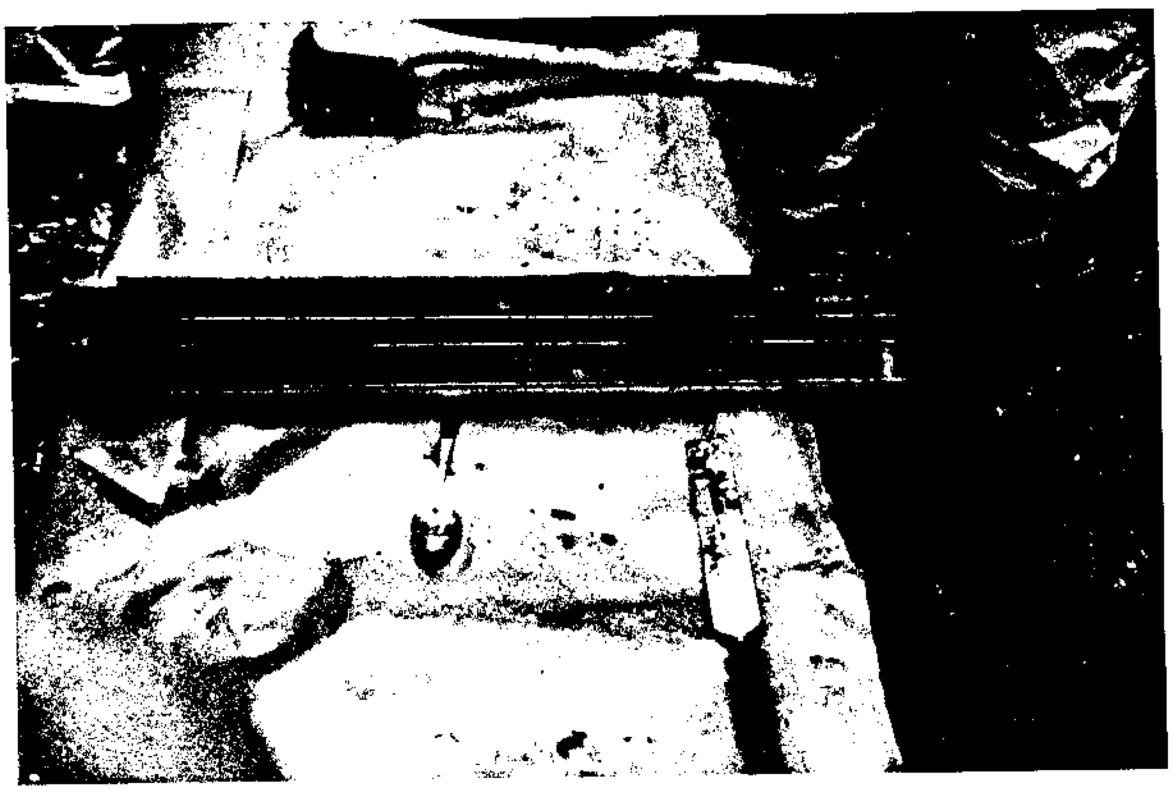
Date/Time: 11/30/89 / 08:50

Lens: Type N/A

SN: N/A

Frame No.: 18, Roll No. 2

Comments: GW-3155 Split Spoon No. 5 (8 - 10 feet).



[UZ]YO7080:D2834, #3086

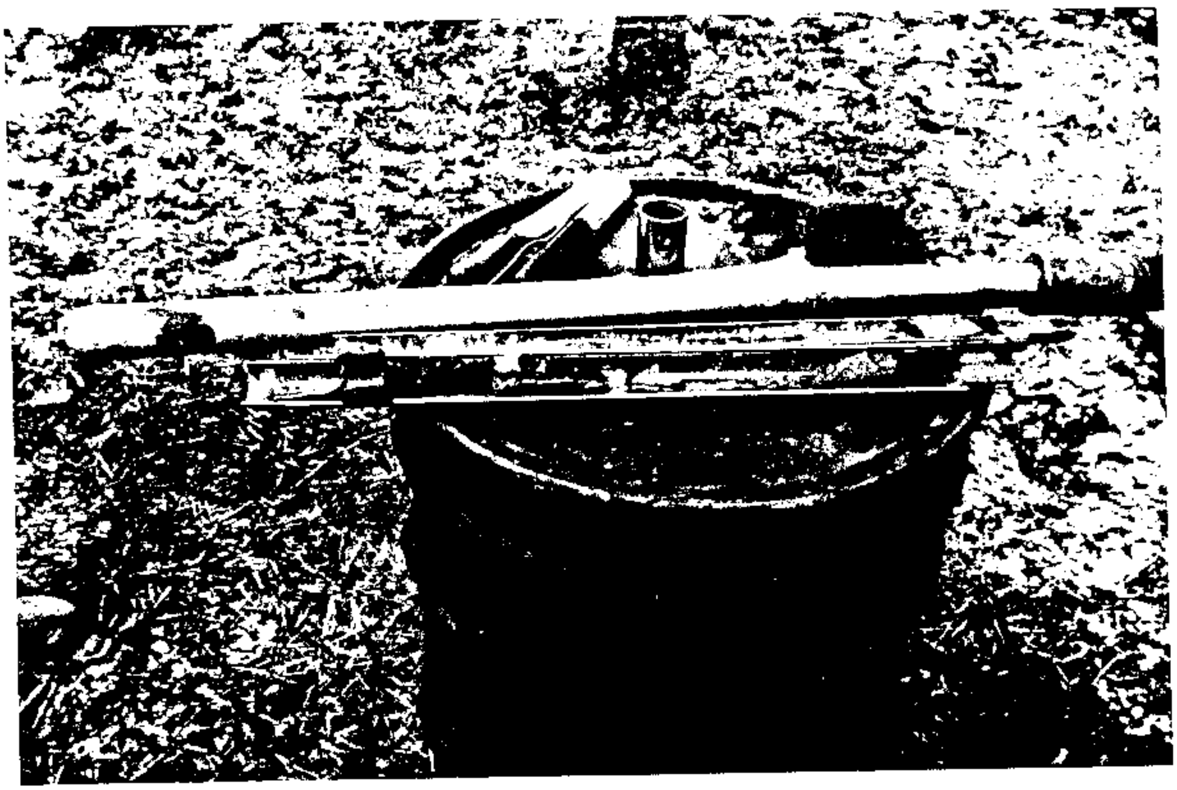
ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC	E & E Job No.: YO-7000
Camera: Make Kodak Fling 35-mm Disposable	SN: N/A

Photographer: G. Florentino		Date/Time: 11/30/89 / 09:00
Lens: Type N/A	SN: N/A	Frame No.: 17, Roll No. 2

Comments: GW-3155 Split Spoon No. 6 (10 - 12 feet).



[UZ]YO7080:D2834, #3086

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 11/30/89 / 09:05

Lens: Type N/A

SN: N/A

Frame No.: 16, Roll No. 2

Comments: View to east of GW-3155 location.

[UZ]YO7080:D2834, #3086

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 11/30/89 / 12:50

Lens: Type N/A

SN: N/A

Frame No.: 15, Roll No. 2

Comments: View to east of GW-3257 location.

recycled paper

[UZ]YO7080:D2834, #3086

ecology and environment

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 11/30/89 / 13:05

Lens: Type N/A

SN: N/A

Frame No.: 14, Roll No. 2

Comments: GW-3257 Split Spoon No. 1 (0 - 2 feet).

[UZ]YO7080:D2834, #3087

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 11/30/89 / 13:30

Lens: Type N/A

SN: N/A

Frame No.: 13, Roll No. 2

Comments: GW-3257 Split Spoon No. 2 (2 - 4 feet).

[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 11/30/89 / 13:40

Lens: Type N/A

SN: N/A

Frame No.: 12, Roll No. 2

Comments: GW-3257 Split Spoon No. 3 (4 - 6 feet).

[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

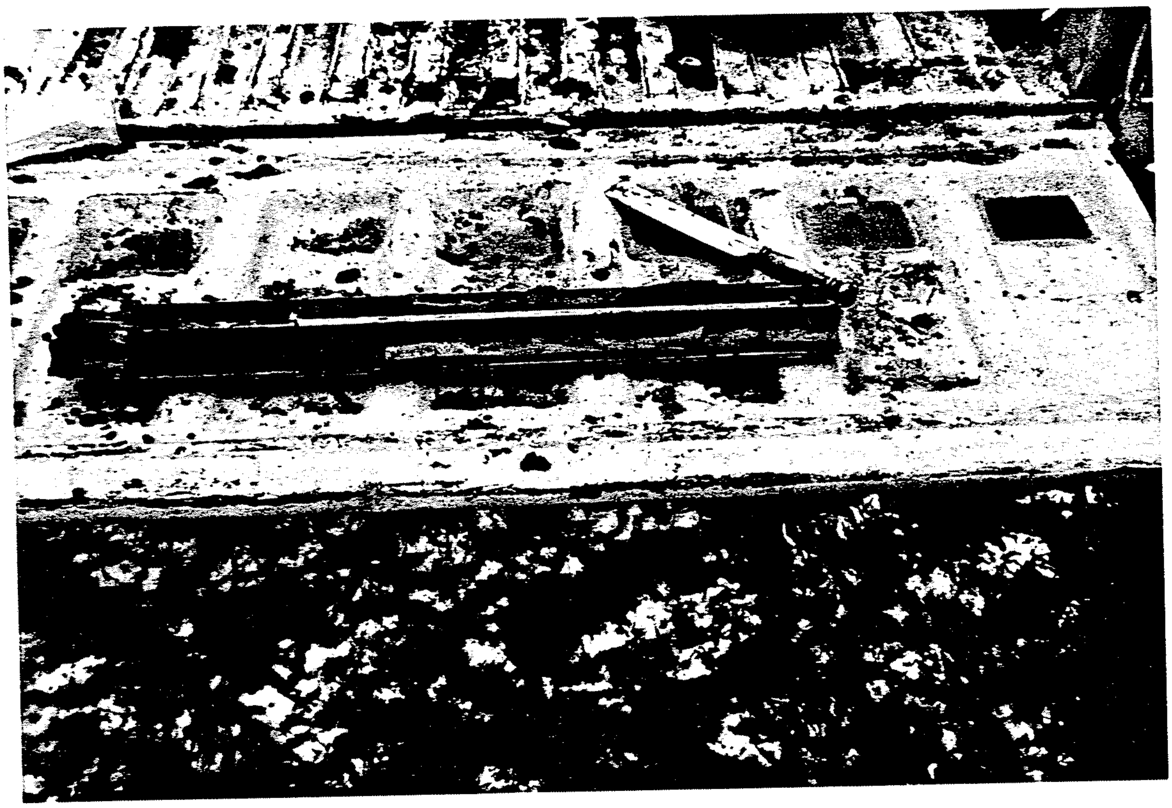
Client: NYSDEC E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable SN: N/A

Photographer: G. Florentino Date/Time: 11/30/89 / 13:58

Lens: Type N/A SN: N/A Frame No.: 11, Roll No. 2

Comments: GW-3257 Split Spoon No. 4 (6 - 8 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

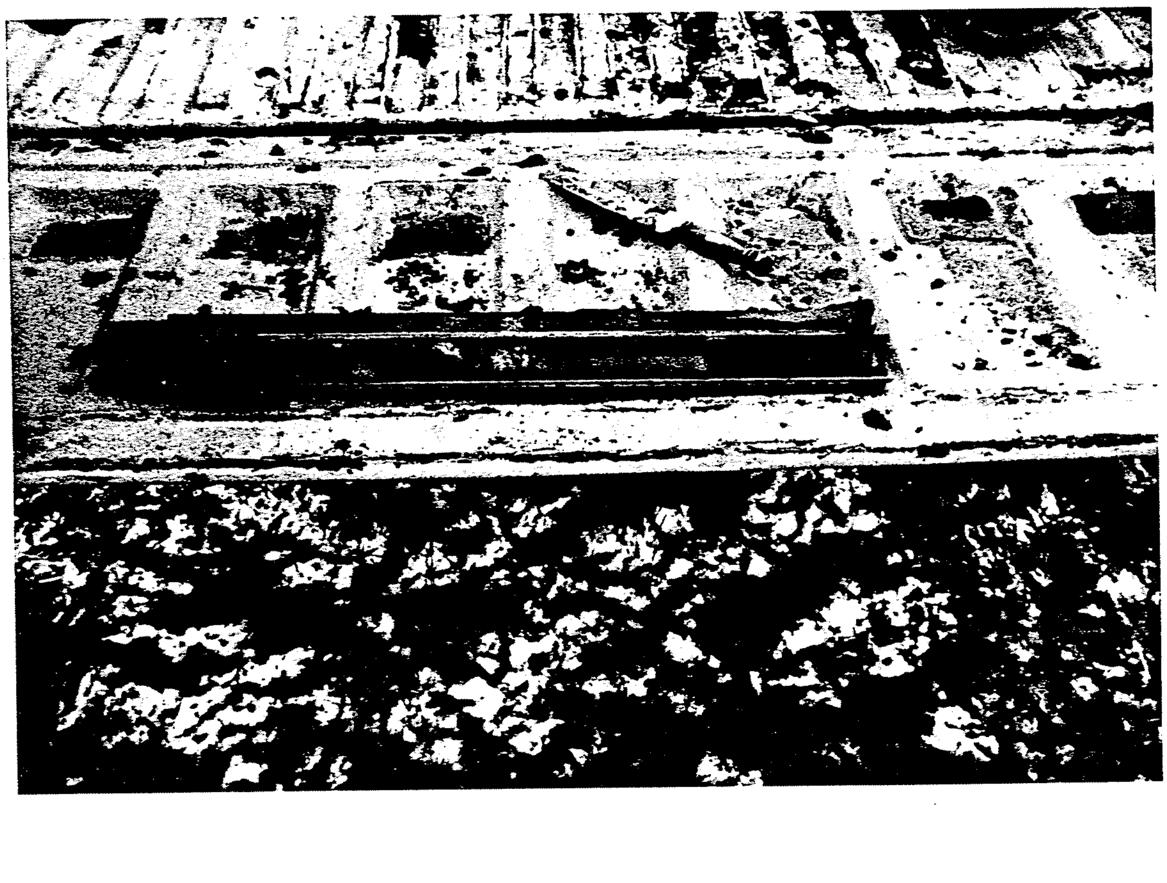
Date/Time: 11/30/89 / 14:20

Lens: Type N/A

SN: N/A

Frame No.: 10, Roll No. 2

Comments: GW-3257 Split Spoon No. 5 (8 - 10 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

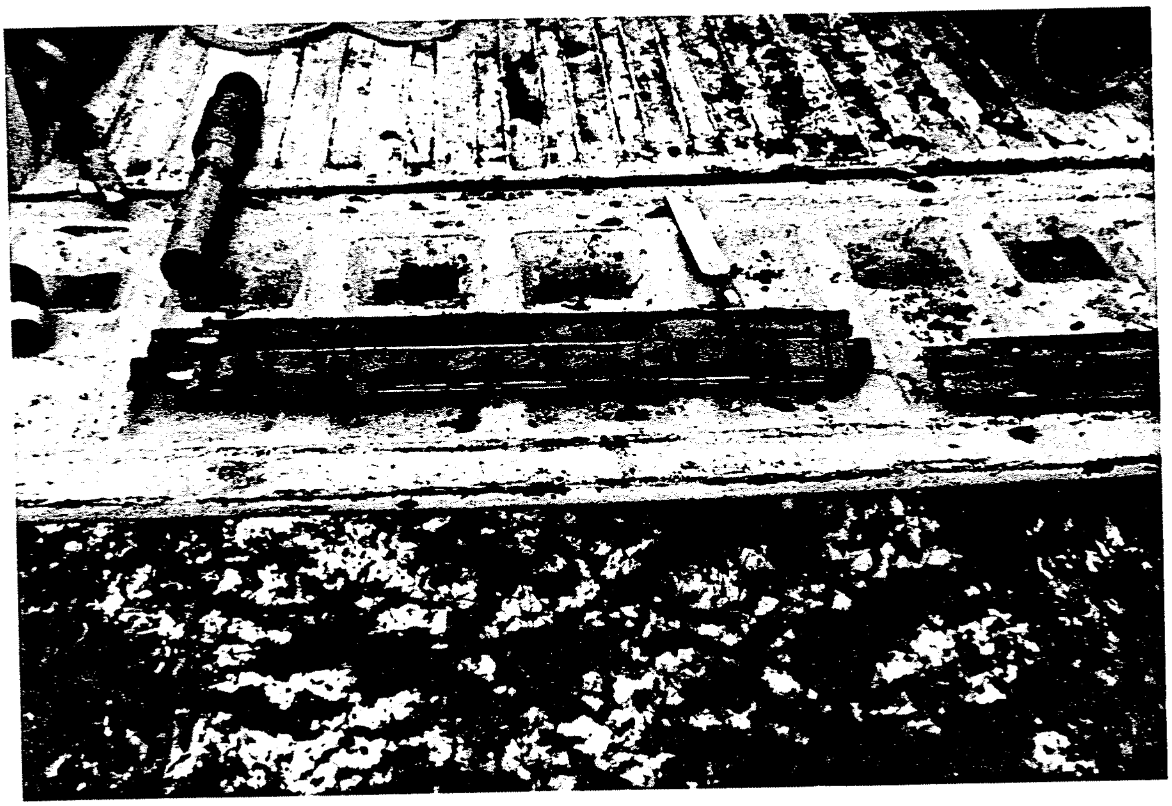
Date/Time: 11/30/89 / 14:30

Lens: Type N/A

SN: N/A

Frame No.: 8, Roll No. 2

Comments: GW-3257 Split Spoon No. 6 (10 - 12 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable SN: N/A

Photographer: G. Florentino Date/Time: 11/30/89 / 15:25

Lens: Type N/A SN: N/A Frame No.: 7, Roll No. 2

Comments: View to northwest of drilling GW-3157 and GW-3257 (uncompleted) 10 feet to east of GW-3157 (auger in ground to right of 55-gallon drum).

[UZ]YO7080:D2834, #3087

ecology and environment, inc.

PHOTOGRAPHIC RECORD

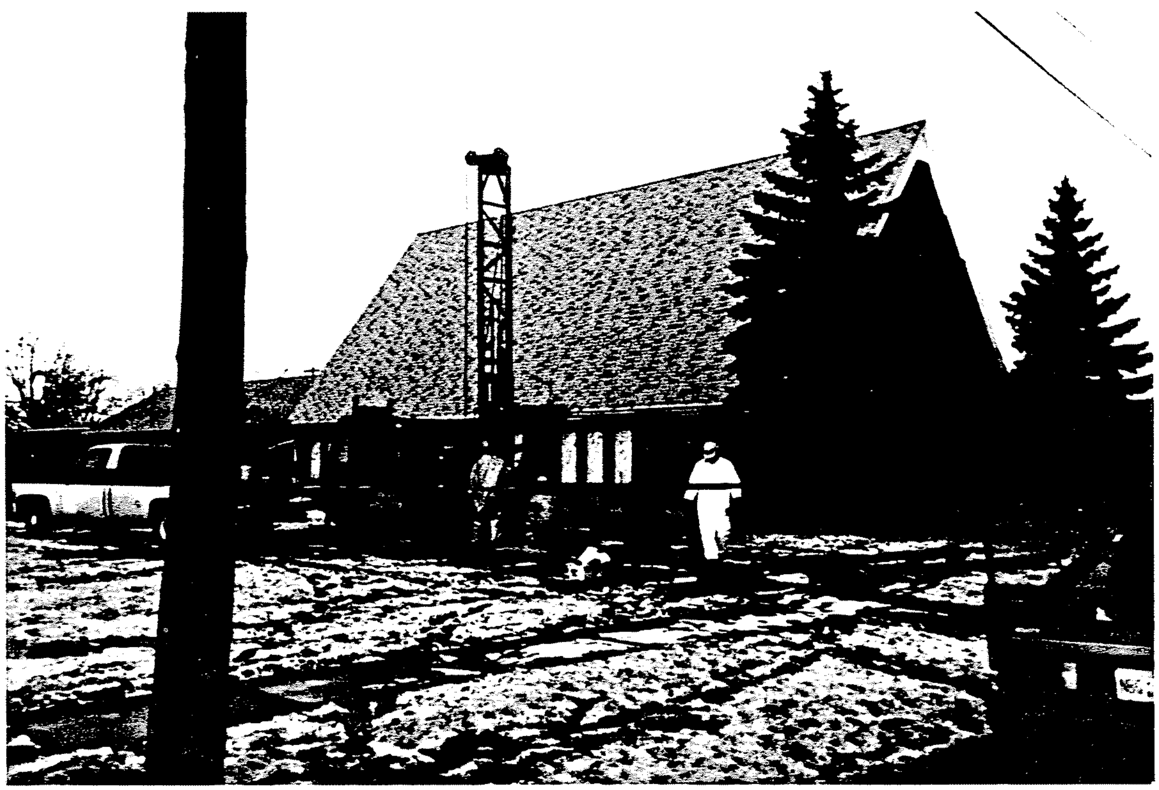
Client: NYSDEC E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable SN: N/A

Photographer: G. Florentino Date/Time: 12/01/89 / 11:35

Lens: Type N/A SN: N/A Frame No.: 6, Roll No. 2

Comments: View to northwest of GW-3159 location.



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

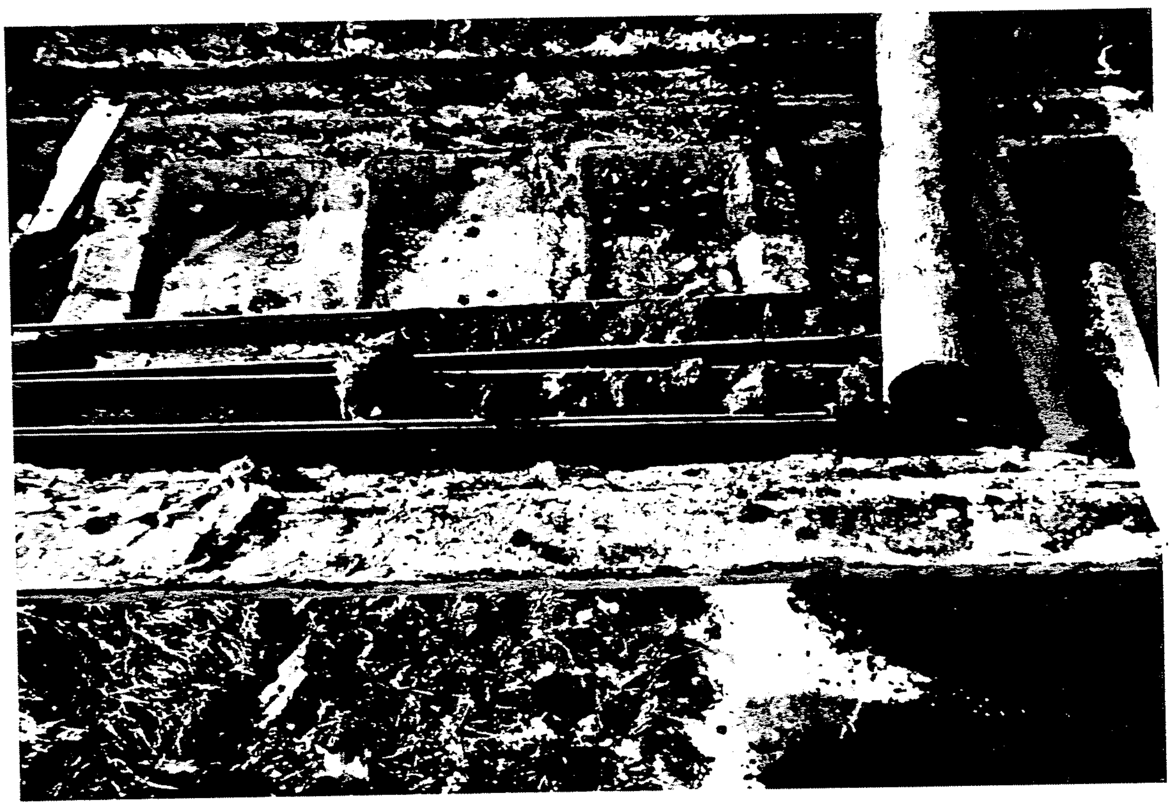
Date/Time: 12/01/89 / 11:35

Lens: Type N/A

SN: N/A

Frame No.: 5, Roll No. 2

Comments: GW-3159 Split Spoon No. 1 (0 - 2 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

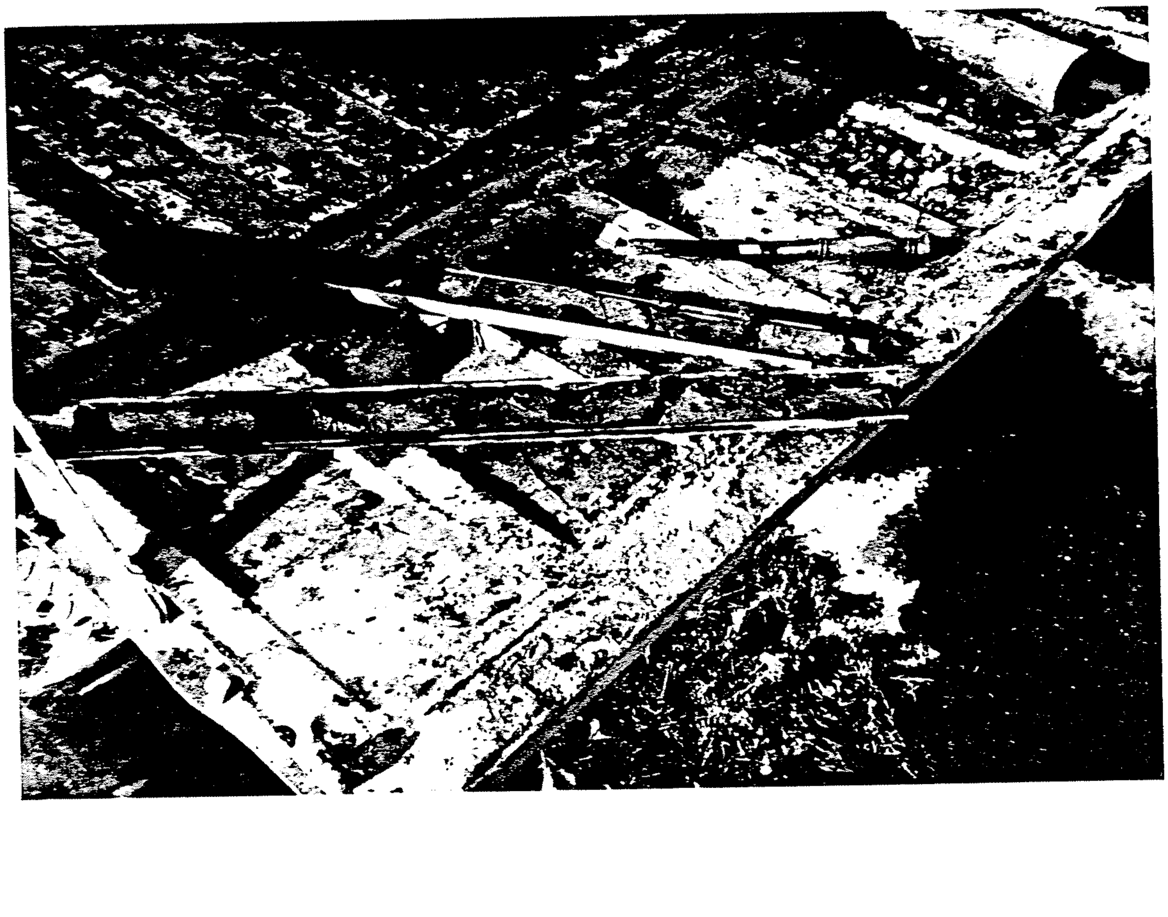
Date/Time: 12/01/89 / 11:50

Lens: Type N/A

SN: N/A

Frame No.: 4, Roll No. 2

Comments: GW-3159 Split Spoon No. 2 (2 - 4 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

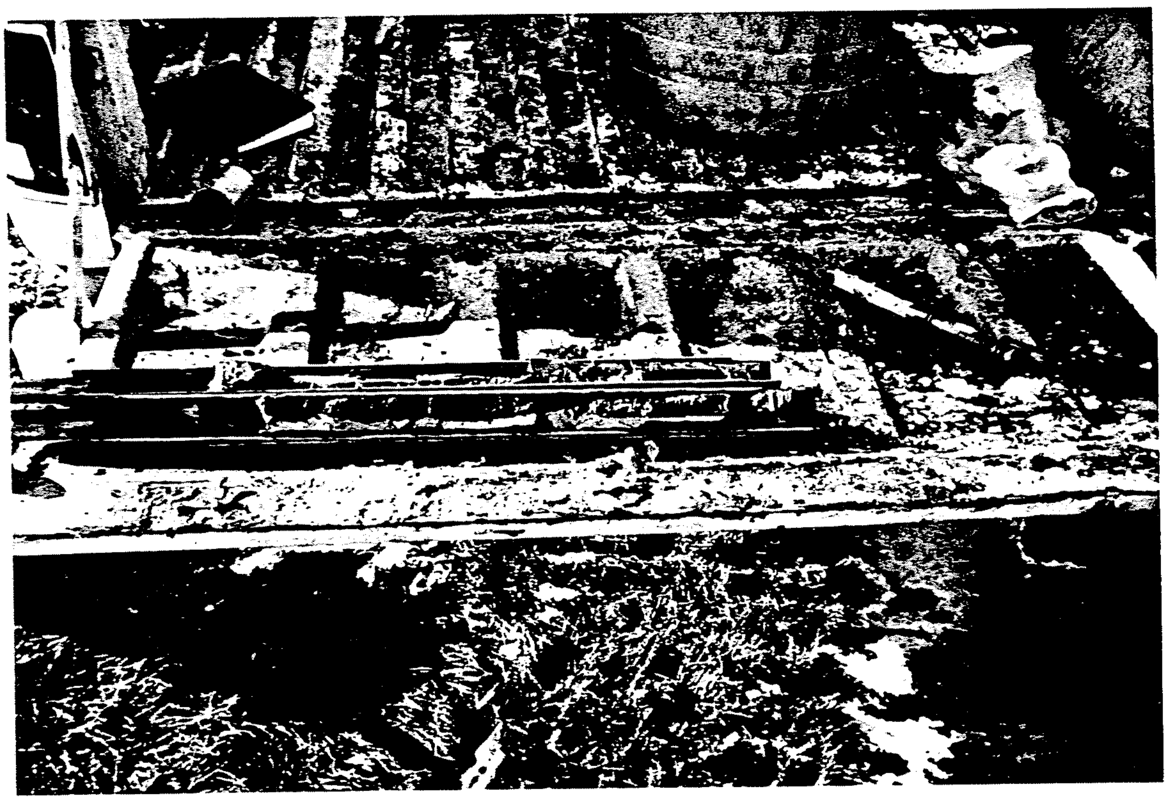
Date/Time: 12/01/89 / 12:15

Lens: Type N/A

SN: N/A

Frame No.: 3, Roll No. 2

Comments: GW-3159 Split Spoon No. 4 (6 - 8 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

PHOTOGRAPHIC RECORD

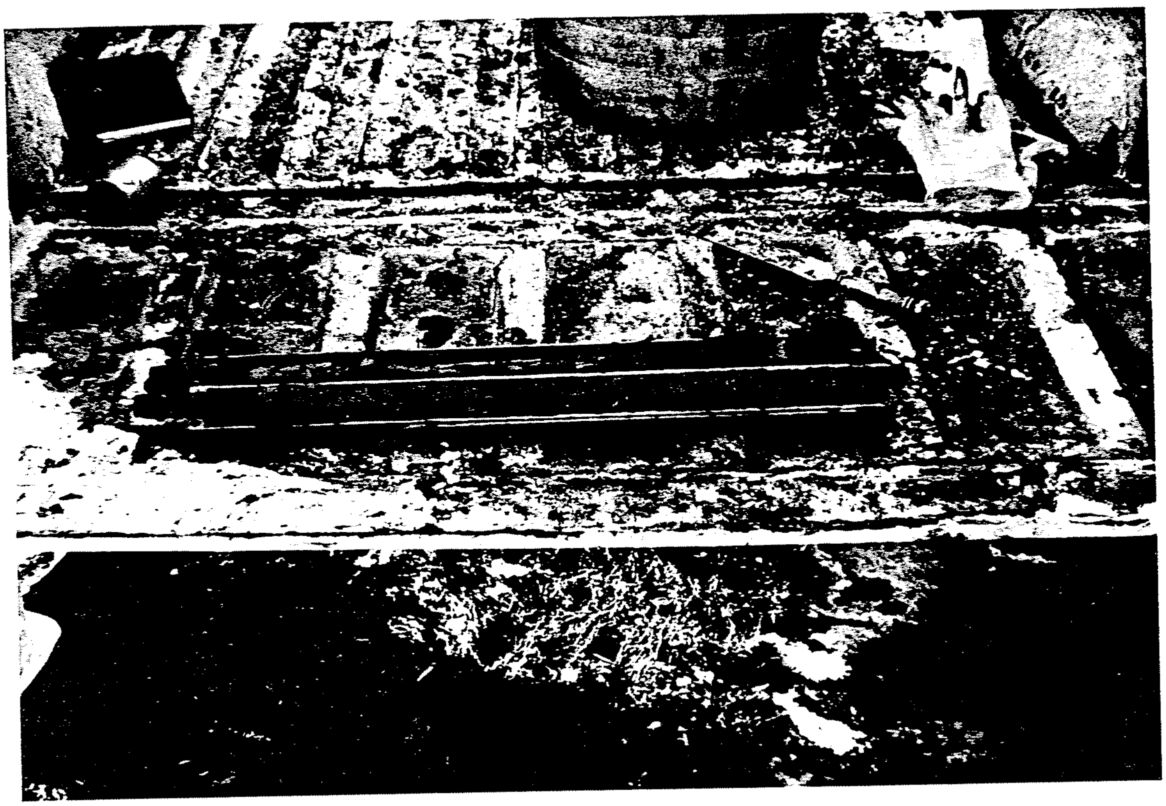
Client: NYSDEC E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable SN: N/A

Photographer: G. Florentino Date/Time: 12/01/89 / 12:20

Lens: Type N/A SN: N/A Frame No.: 2, Roll No. 2

Comments: GW-3159 Split Spoon No. 5 (8 - 10 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

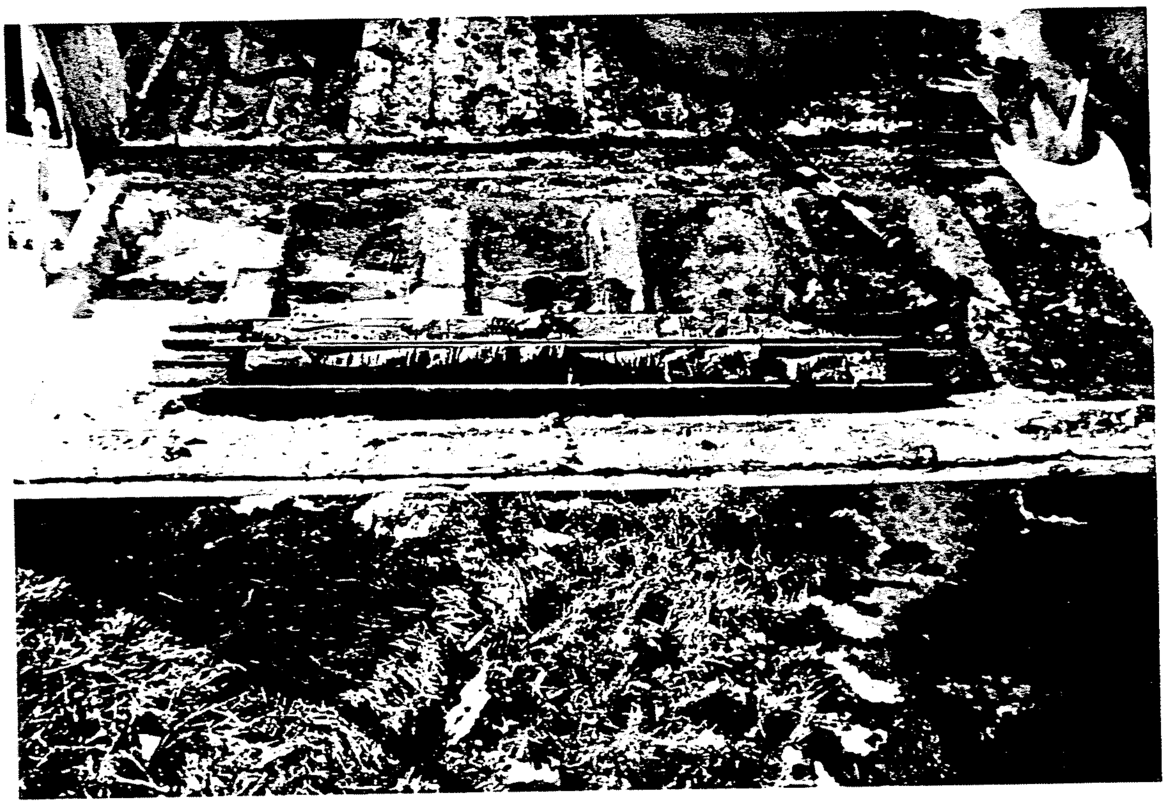
Date/Time: 12/01/89 / 12:30

Lens: Type N/A

SN: N/A

Frame No.: 1, Roll No. 2

Comments: GW-3159 Split Spoon No. 6 (10 - 12 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

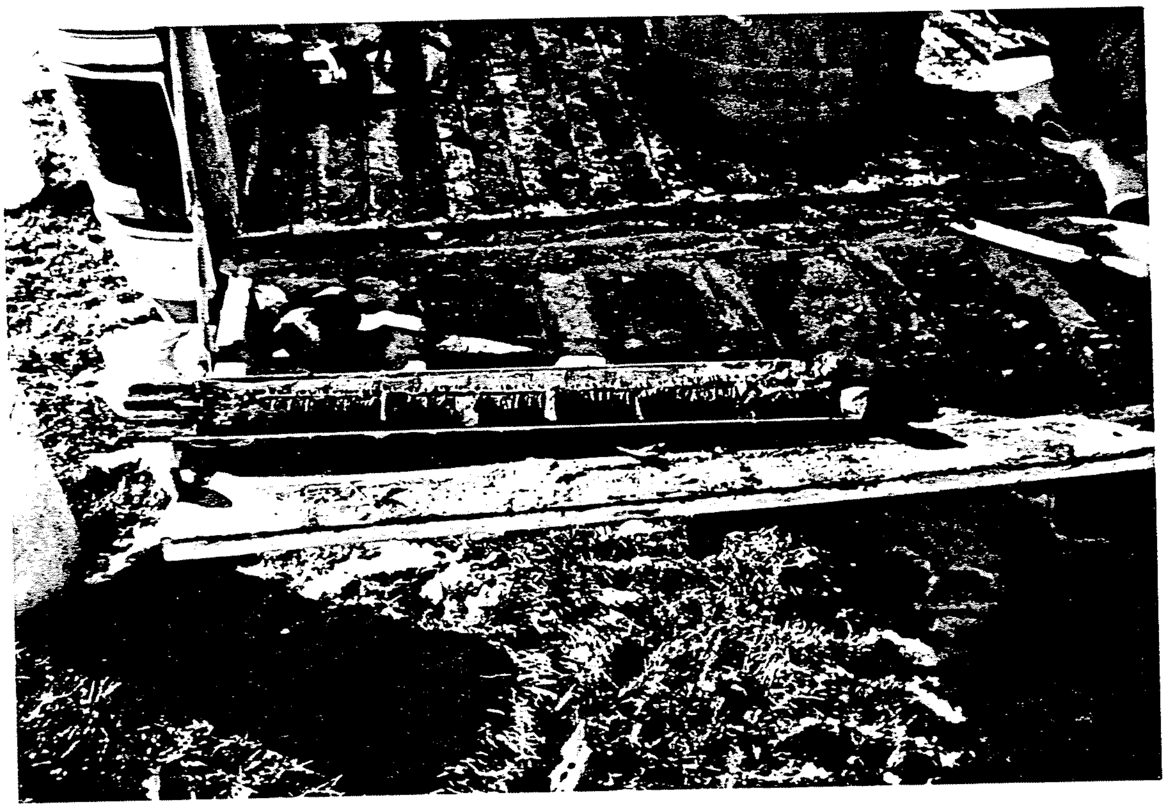
Date/Time: 12/01/89 / 12:45

Lens: Type N/A

SN: N/A

Frame No.: 0, Roll No. 2

Comments: GW-3159 Split Spoon No. 7 (12 - 14 feet).



[UZ]YO7080:D2834, #3087

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/04/89 / 11:10

Lens: Type N/A

SN: N/A

Frame No.: 23, Roll No. 3

Comments: View to southeast of SS-7 location (blacktop parking lot area).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/04/89 / 12:06

Lens: Type N/A

SN: N/A

Frame No.: 22, Roll No. 3

Comments: View to south of SS-8 location (blacktop parking lot area, 97th Street to left).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/04/89 / 14:37

Lens: Type N/A

SN: N/A

Frame No.: 21, Roll No. 3

Comments: GW-3257 Split Spoon No. 7 (12 - 14 feet).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/04/89 / 14:43

Lens: Type N/A

SN: N/A

Frame No.: 20, Roll No. 3

Comments: GW-3257 Split Spoon No. 8 (14 - 16 feet),

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

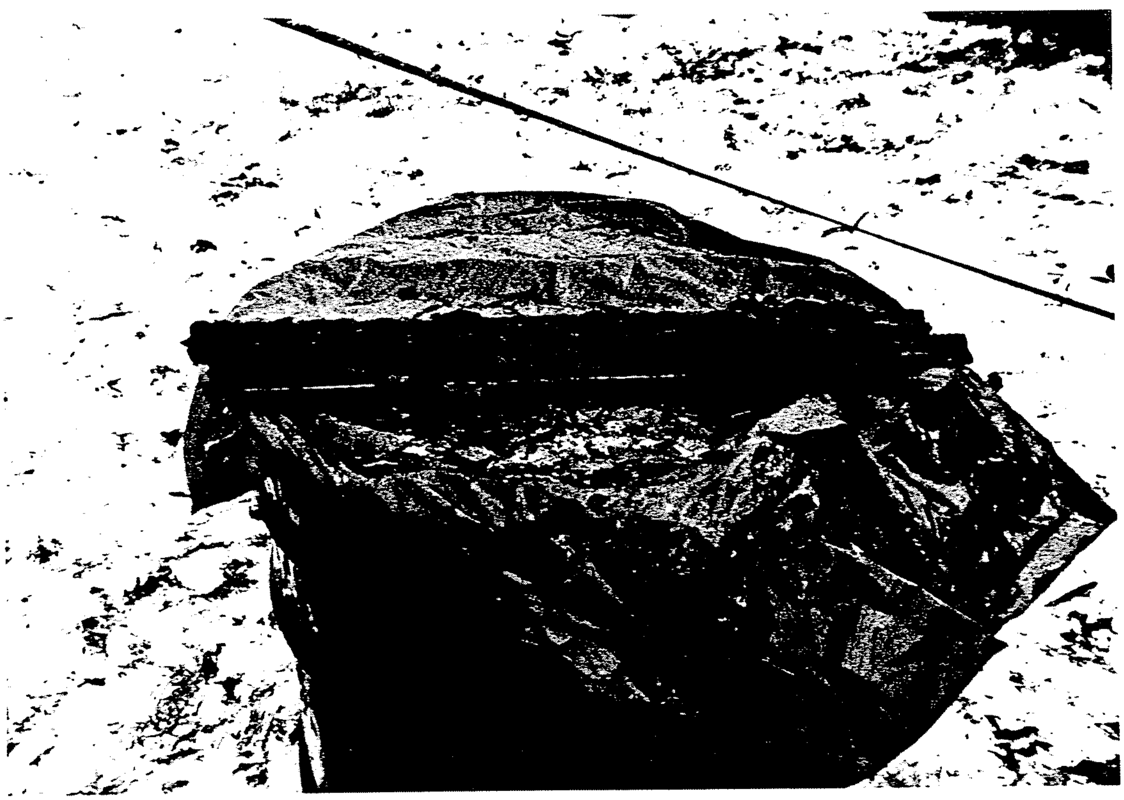
Date/Time: 12/04/89 / 15:00

Lens: Type N/A

SN: N/A

Frame No.: 19, Roll No. 3

Comments: GW-3257 Split Spoon No. 9 (16 - 18 feet).



[UZ]YO7080:D2834, #3088

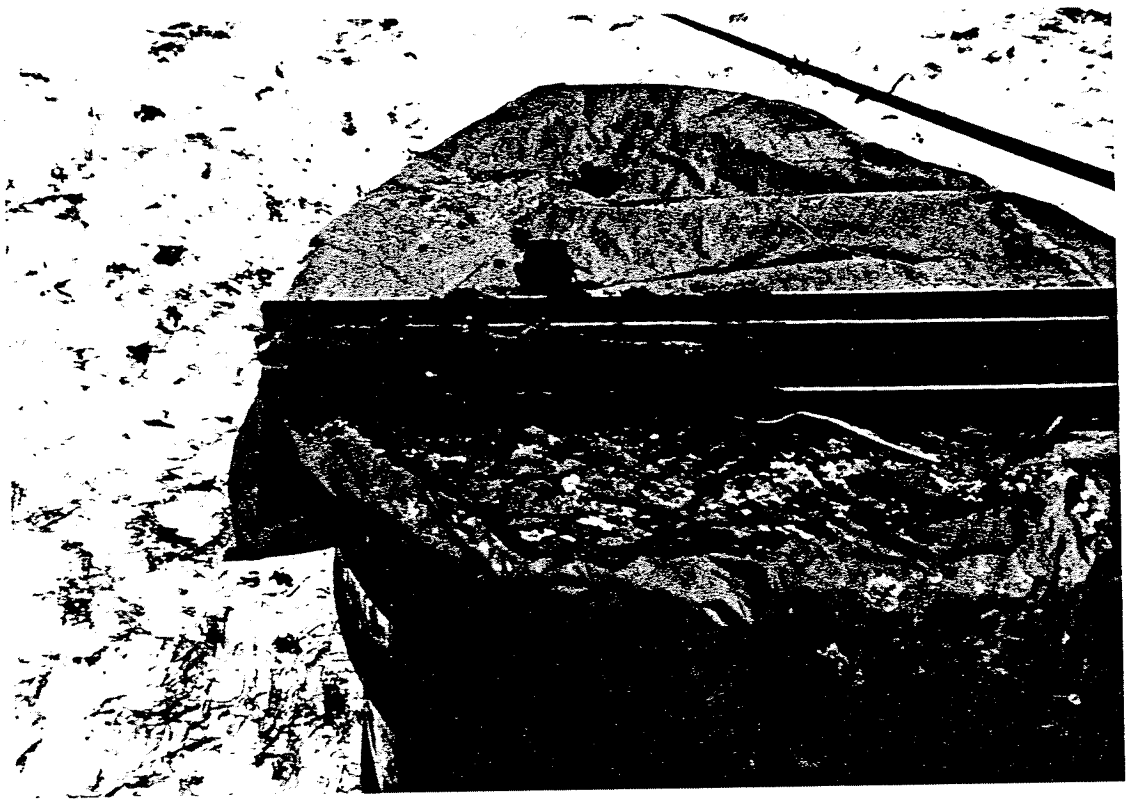
ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client:	NYSDEC	E & E Job No.:	YO-7000
Camera: Make	Kodak Fling 35-mm Disposable	SN:	N/A

Photographer:	G. Florentino			Date/Time:	12/04/89 / 15:15
Lens: Type	N/A	SN:	N/A	Frame No.:	18, Roll No. 3

Comments: GW-3257 Split Spoon No. 10 (18 - 20 feet).



[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

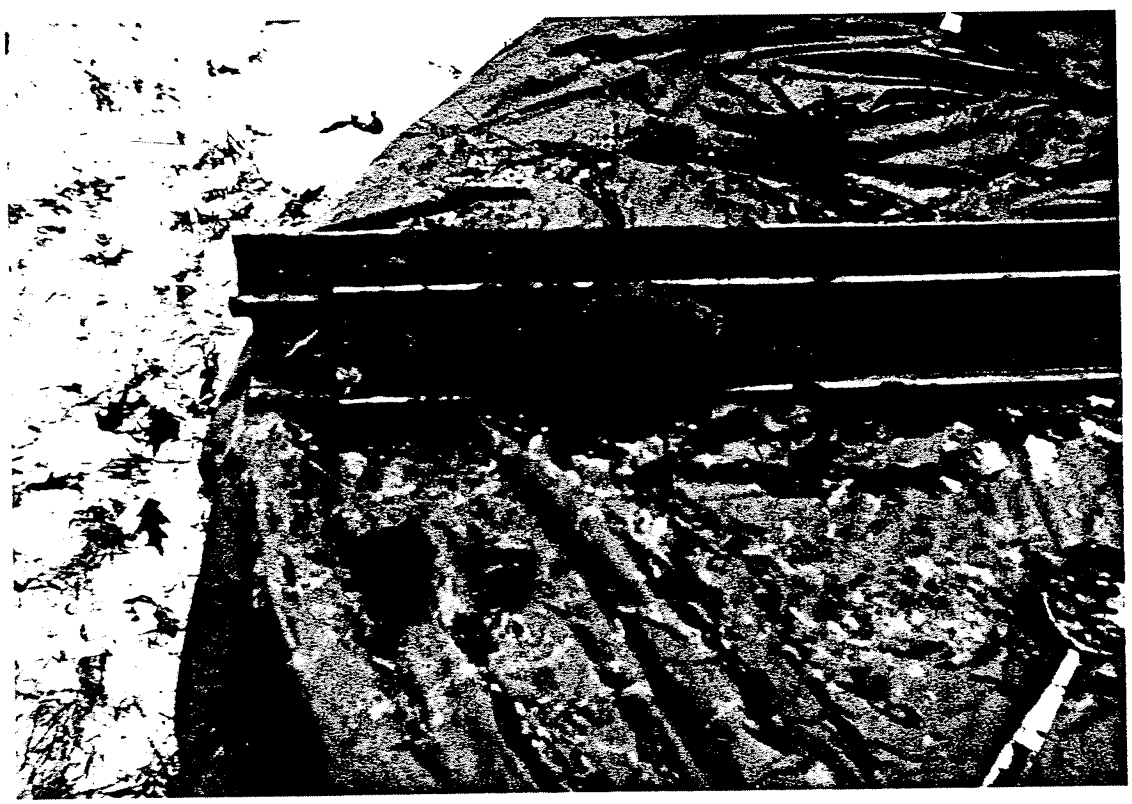
Date/Time: 12/04/89 / 15:30

Lens: Type N/A

SN: N/A

Frame No.: 17, Roll No. 3

Comments: GW-3257 Split Spoon No. 11 (20 - 22 feet).



[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/04/89 / 15:44

Lens: Type N/A

SN: N/A

Frame No.: 16, Roll No. 3

Comments: GW-3257 Split Spoon No. 12 (22 - 24 feet).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

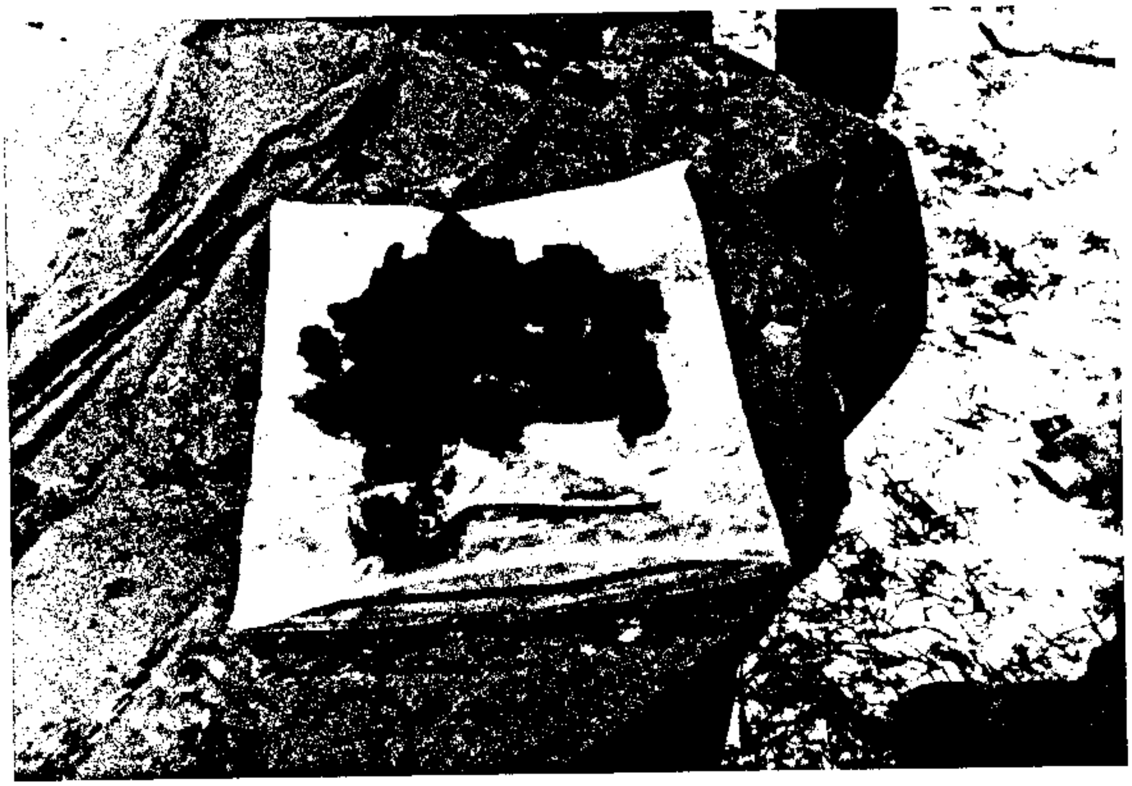
Date/Time: 12/04/89 / 16:19

Lens: Type N/A

SN: N/A

Frame No.. 15, Roll No. 3

Comments: GW-3257 Split Spoon No. 13 (24 - 26 feet).



[UZ]YO7080:D2834, #3080

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

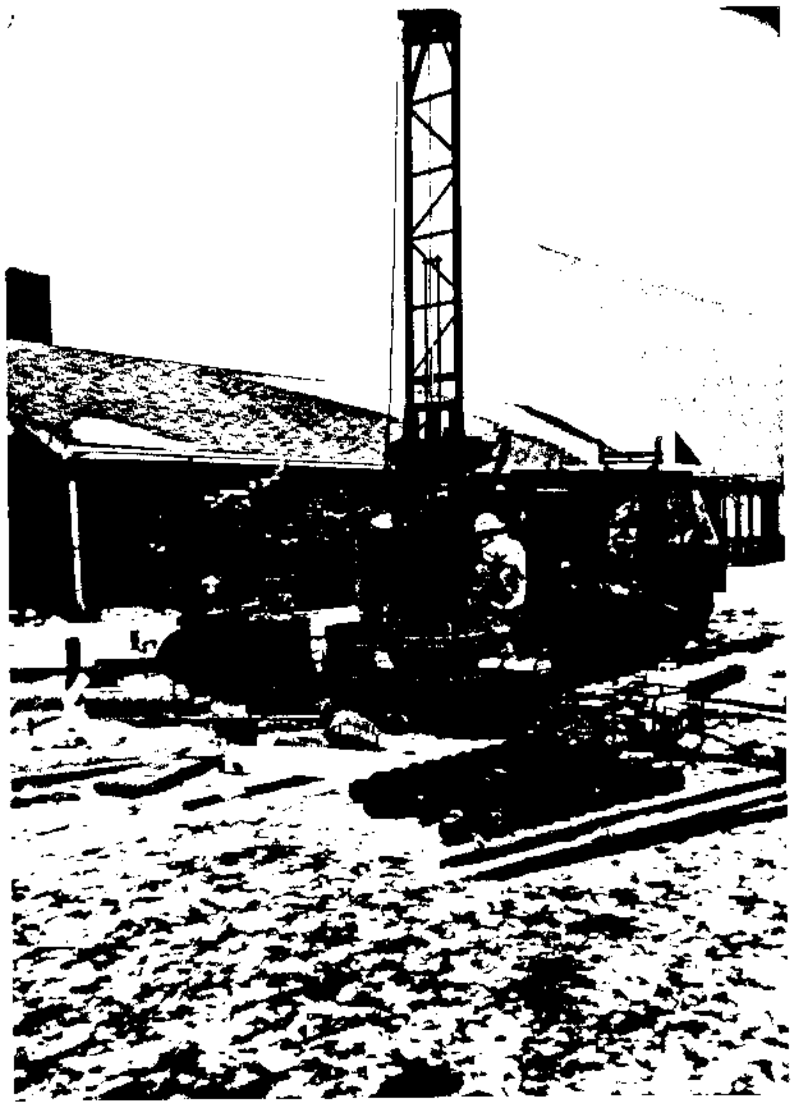
Date/Time: 12/05/89 / 12:05

Lens: Type N/A

SN: N/A

Frame No.. 14, Roll No. 3

Comments: View of northeast of rock coring GW-3257.



(UZ)YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

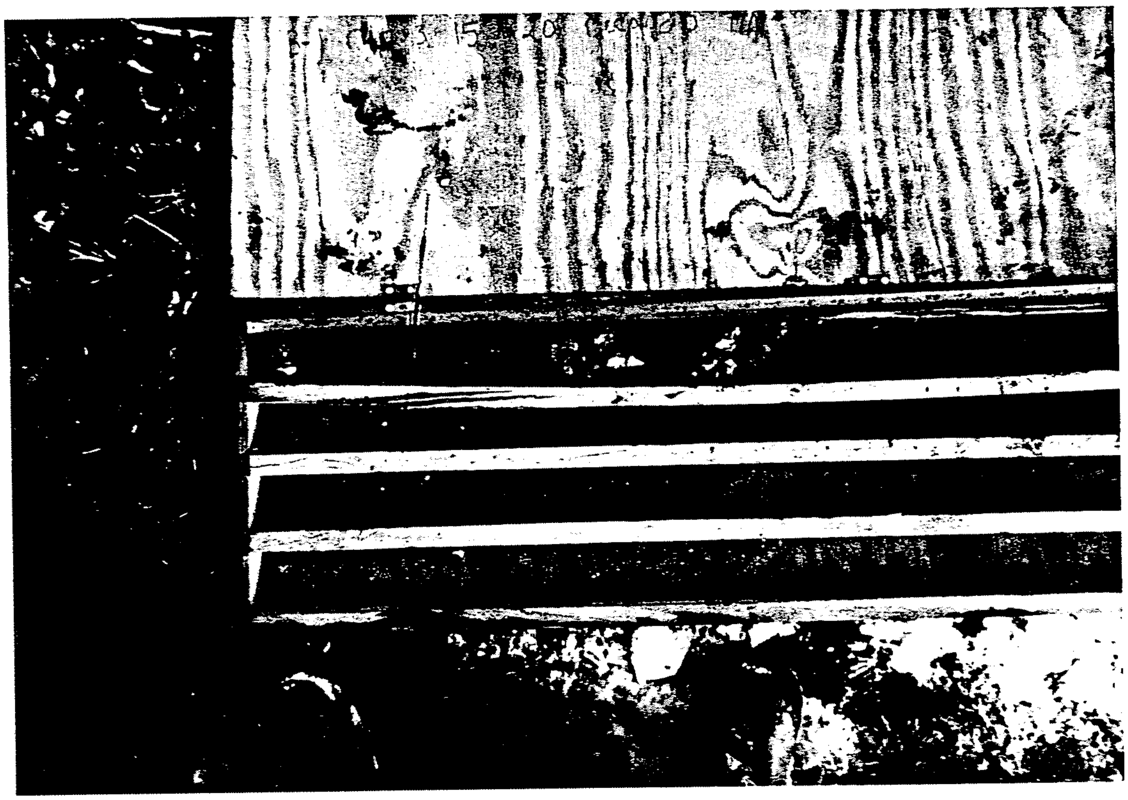
Date/Time: 12/05/89 / 13:20

Lens: Type N/A

SN: N/A

Frame No.: 13, Roll No. 3

Comments: First core run in GW-3257. Recovered 1.7 feet of 5-foot section.



[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

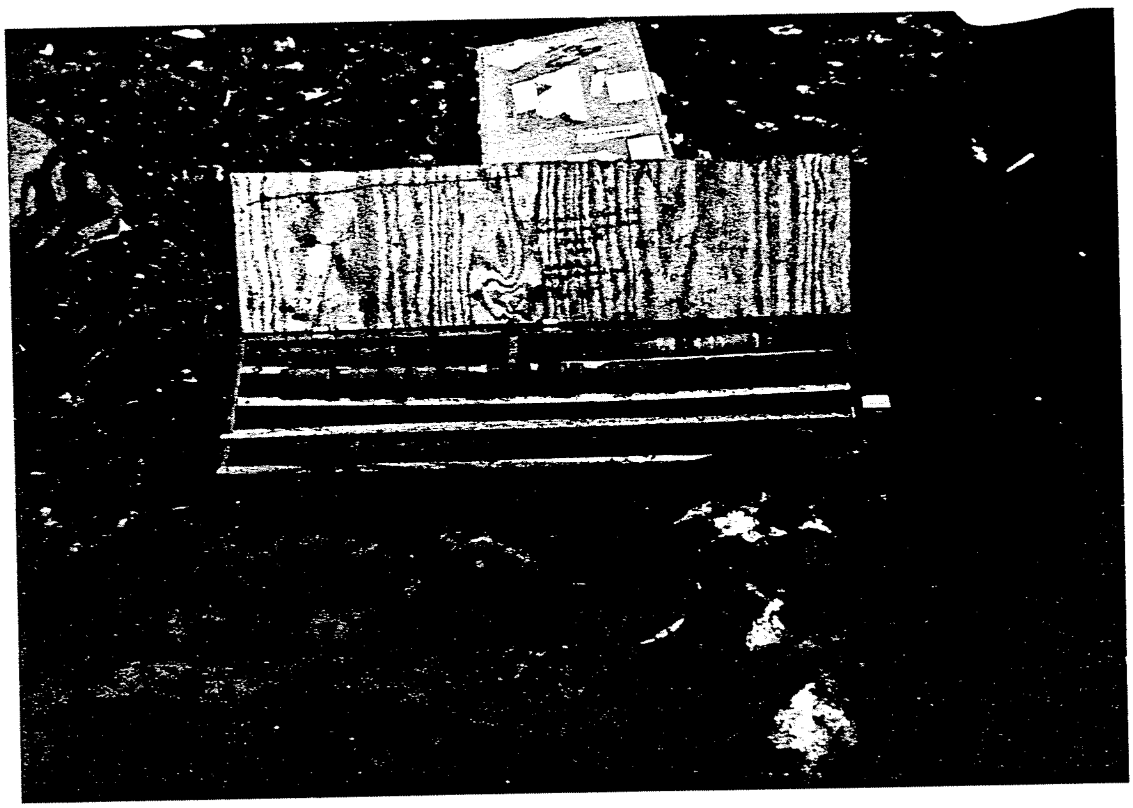
Date/Time: 12/06/89 / 09:37

Lens: Type N/A

SN: N/A

Frame No.: 12, Roll No. 3

Comments: Second core run in GW-3257. Recoverd 10 feet of 10-foot core. Photo shows entire core section from borehole depth 25 to 40 feet.



[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 08:40

Lens: Type N/A

SN: N/A

Frame No.: 11, Roll No. 3

Comments: View to west of Test Pit No. 1 (blacktop area of parking lot).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 09:05

Lens: Type N/A

SN: N/A

Frame No.: 10, Roll No. 3

Comments: View to west of Test Pit No. 1 (width approximately 2 feet).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

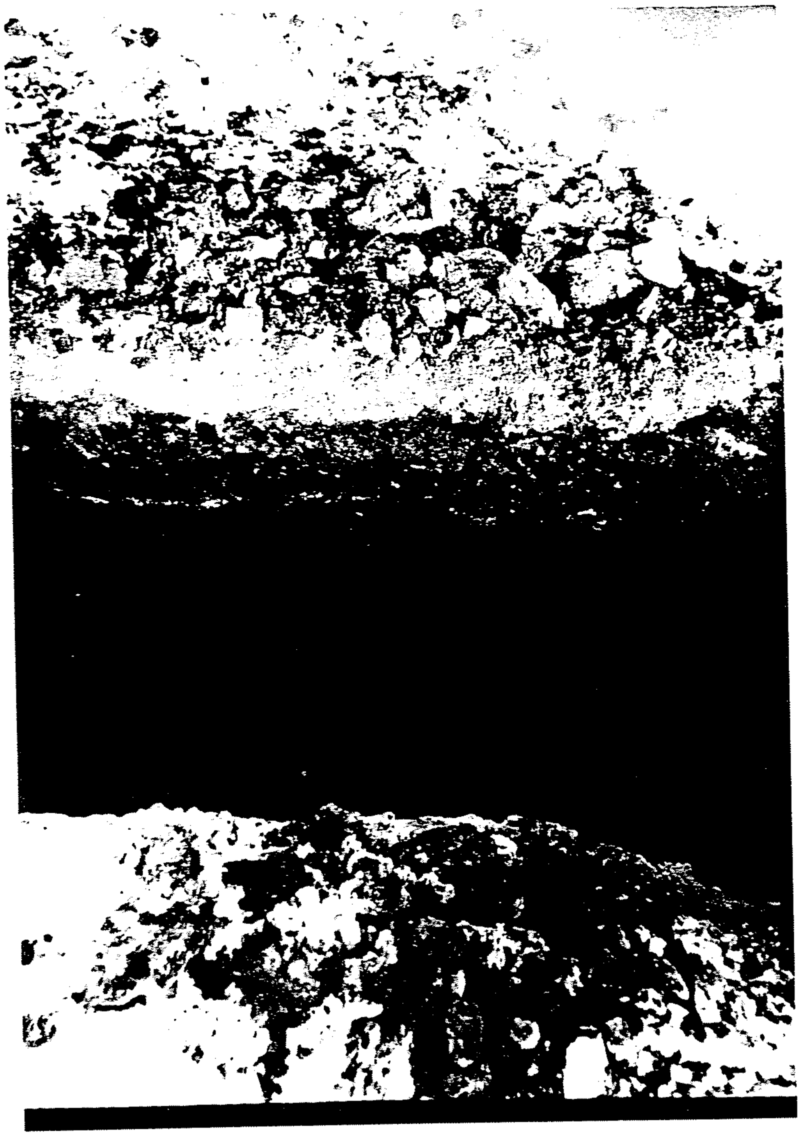
Date/Time: 12/18/89 / 09:10

Lens: Type N/A

SN: N/A

Frame No.: 9, Roll No. 3

Comments: View to north of inside of Test Pit No. 1.



[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 10:05

Lens: Type N/A

SN: N/A

Frame No.: 8, Roll No. 3

Comments: View to east of Test Pit No. 2 (blacktop area of parking lot).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

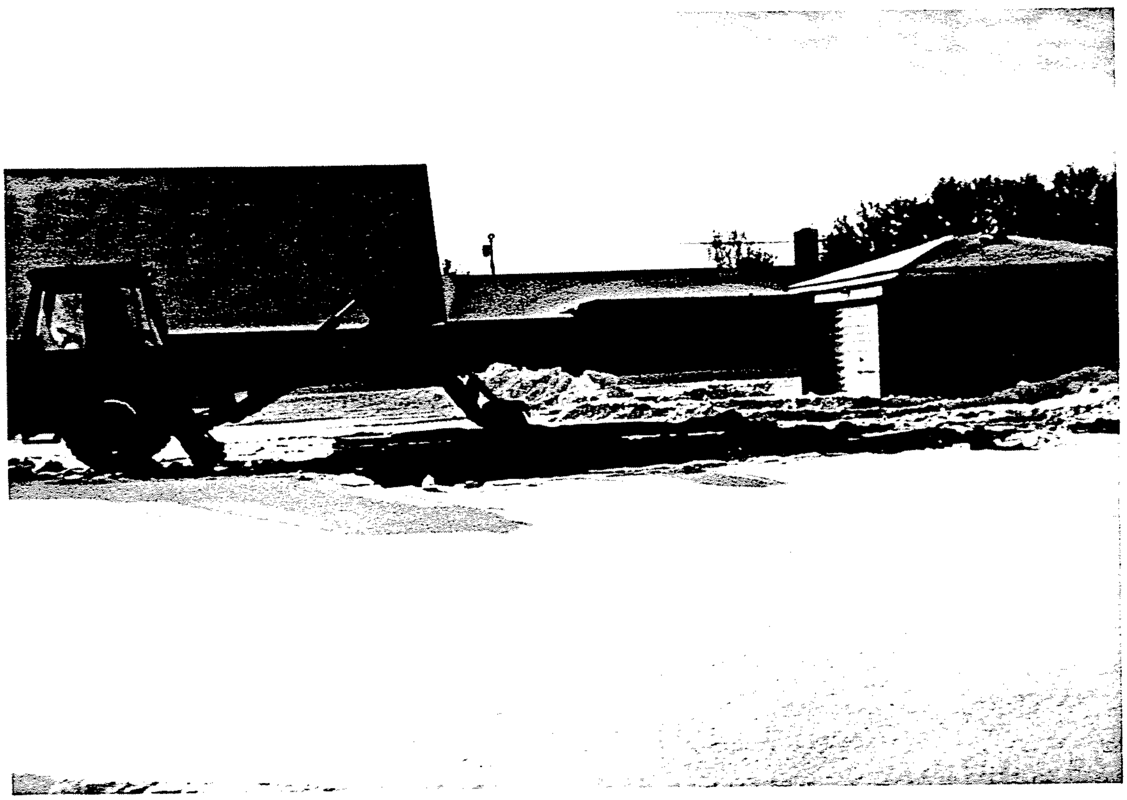
Date/Time: 12/18/89 / 10:15

Lens: Type N/A

SN: N/A

Frame No.: 7, Roll No. 3

Comments: View to south of Test Pit No. 2.



[UZ]YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 10:22

Lens: Type N/A

SN: N/A

Frame No.: 6, Roll No. 3

Comments: View to north of inside of Test Pit No. 2. Note bricks in foreground.

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 10:45

Lens: Type N/A

SN: N/A

Frame No.: 5, Roll No. 3

Comments: View to west of Test Pit No. 3 (blacktop area of parking lot).

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 10:50

Lens: Type N/A

SN: N/A

Frame No.: 4, Roll No. 3

Comments: View to north of Test Pit No. 3. Note brick and large rock fragments on sides of pit.

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

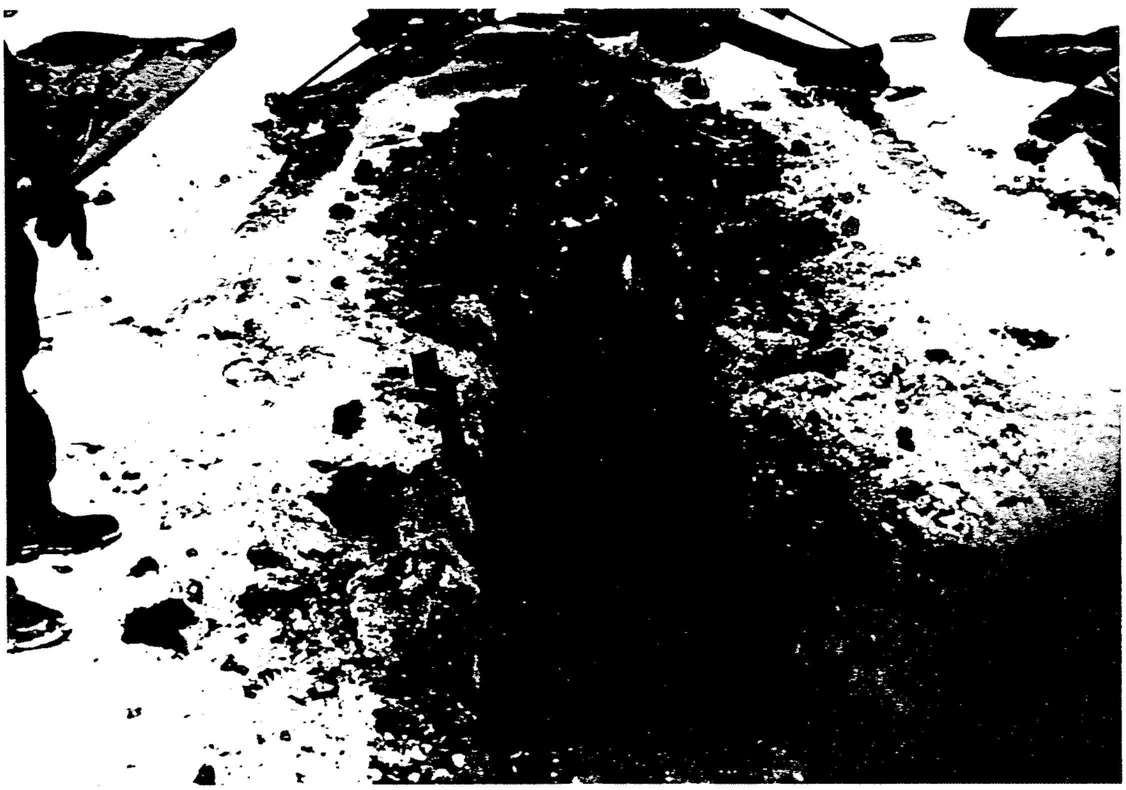
Client: NYSDEC E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable SN: N/A

Photographer: G. Florentino Date/Time: 12/18/89 / 11:10

Lens: Type N/A SN: N/A Frame No.: 3, Roll No. 3

Comments: View to north of Test Pit No. 3. Note piece of steel on left side of pit and reinforcement steel bar in center of pit.



[UZ]YO7080:D2834, #3088

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 11:10

Lens: Type N/A

SN: N/A

Frame No.: 2, Roll No. 3

Comments: View of concrete fragment (Sample TP-3) from Test Pit No. 3.

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 11:10

Lens: Type N/A

SN: N/A

Frame No.: 1, Roll No. 3

Comments: View of rubber boot from Test Pit No. 3.

[UZ]YO7080:D2834, #3088

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YO-7000

Camera: Make Kodak Fling 35-mm Disposable

SN: N/A

Photographer: G. Florentino

Date/Time: 12/18/89 / 11:11

Lens: Type N/A

SN: N/A

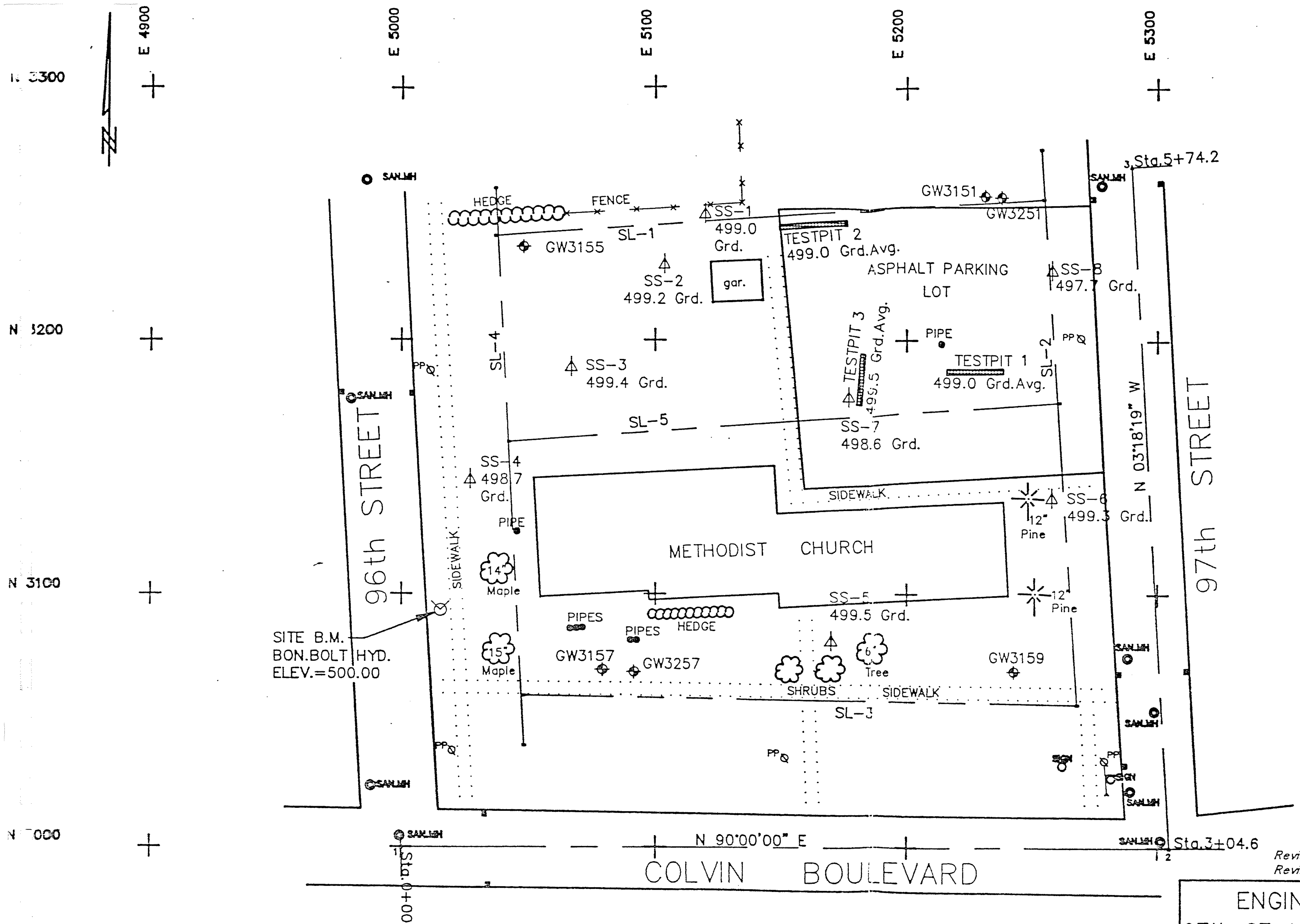
Frame No.: 0, Roll No. 3

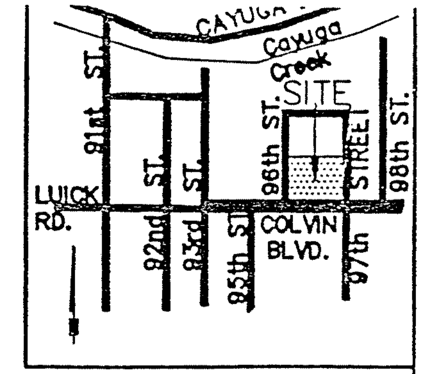
Comments: View to west of inside of Test Pit No. 3. Note steel bars in left-center and right-center.

[UZ]YO7080:D2834, #3088

APPENDIX H

SITE SURVEY MAP





LOCATION SKETCH
N.T.S.

COORDINATE LIST		
NAME	NORTH	EAST
GW 3157	3070	5079
GW 3257	3069	5091
GW 3159	3070	5243
GW 3151	3257	5231
GW 3251	3257	5237
GW 3155	3237	5048
SS-1	3250	5121
SS-2	3230	5103
SS-3	3189	5067
SS-4	3145	5027
SS-5	3081	5169
SS-6	3138	5258
SS-7	3178	5177
SS-8	3228	5258
PK 1	3000.00	5000.00
PK 2	3000.00	5304.56
PK 3	3269.25	5289.01

LEGEND

- SL-5 SEISMIC LINE
- MONITORING WELL
- SURFACE SOIL SAMPLE
- TEST PIT

Revised 4/02/90 tree labels
Revised 3/26/90 symbol changes

NAME	TOP CASE	TOP RISER	GROUND
GW3157	501.78	501.53	499.3
GW3257	501.99	501.78	499.1
GW3159	502.45	502.34	499.4
GW3151	502.45	---	499.3
GW3251	502.40	---	498.8
GW3155	501.79	501.67	498.8

NOTE: Coordinate grid system is assumed

Elevations are referenced to a Bonnet Bolt on Hydrant on East side 96th St., assumed elevation of 500.00.

Baseline points at sta. 0+00 ,sta 3+04.6, and sta. 5+74.2 are PK nails.

ENGINEERING INVESTIGATIONS AT 97th ST. METHODIST CHURCH Site No.932084

New York State Department of Environmental Conservation

Prepared for:
Ecology and Environment Eng., P.C.
368 Pleasantview Drive
Lancaster, New York 14086

Prepared by:
OM P. POPLI, P.E.,P.L.S.
2140 South Clinton Avenue
Rochester, New York 14618
Tel. No. 716-442-6940

DATE	SCALE	SHEET
03/21/90	1"= 40'	1

APPENDIX I

SITE LOGBOOKS

ecology and environment, inc.

International Specialists in the Environment

Job Number YO - 7000

97th St. Church Site
Niagara Falls, NY
Site Recon

ecology and environment, inc.

Recycled Paper E69058

New York State
Department of
Environmental Conservation

ASHOK K. GUPTA, P.E.
Sanitary Engineer
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

50 Wolf Road
Albany, NY 12233-7010

(518) 457-0927

E & E Job Number YO-7000

Telephone Code Number 716-684-8060

Site Name 97th St Church Site

State/City Niagara Falls, NY

TDD

PAN

SSID

Start/Finish Date 10/11/89 /

Book 1 of

E & E Emergency Response Center: (716) 684-8940

Wednesday 10/11/89

Weather: overcast, cool 50°F, light wind from North

0930 G. Florentine & J. Nickerson departed E&E headquarters to pick up equipment at lab

1015 Arrived at Love Canal Information Office on Colvin Blvd

Met with AK Gupta (NYSDEC-Albany)

1030 Arrived at 97 5? Methodist Church site

Calibrated HNu 55 ppm 9.78 span

Background Mini Rad 9 counts/min.

Also using Gold Film Mercury Vapor Analyzer Model 411

Today's Objective: Site Reconnaissance
Camera: Minolta XG-1
serial # 7042661

Lens: Minolta 50 mm
Serial # 2792181

Film: Kodacolor Gold 100 ASA
Roll No. 1

Gene Florentine 10/11/89

10/11/89

1045 Frame ~~13~~ GF 12
View to NW of SE corner of site

1046 Frame ~~14~~ GF 13
View to North of east side of site

1047 Frame ~~15~~ GF 14
View to west of south side of site

1048 Frame ~~16~~ GF 15
View to west of north side of site

1049 Frame ~~17~~ GF 16
View to SW of NE corner of site

1051 Frame ~~18~~ GF 17
View to NE of SW corner of site

1052 Frame ~~19~~ GF 18
View to North of west side of site

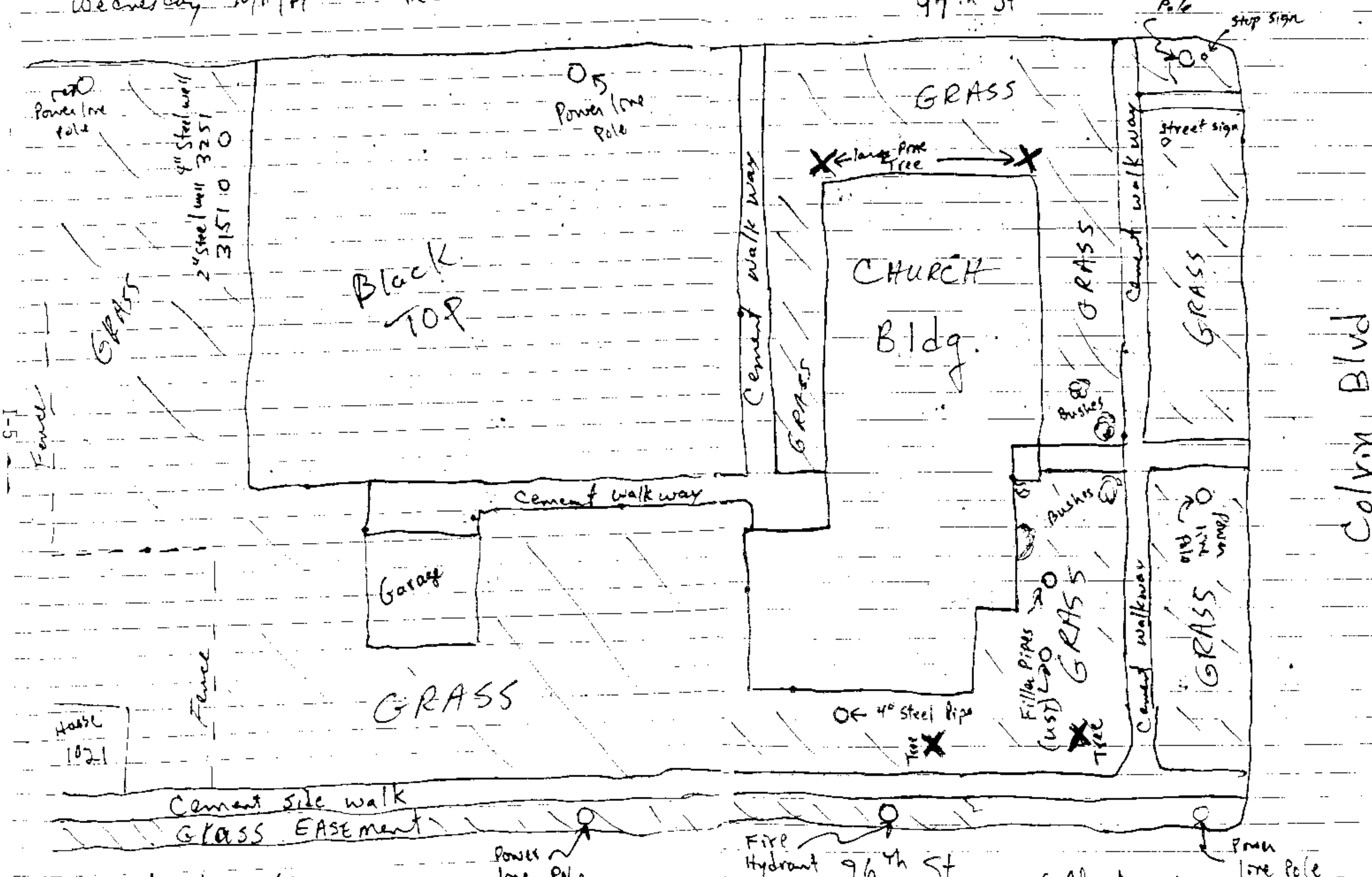
1053 Frame ~~20~~ GF 19
View to SE of NW corner of site

1112 Foundation of Church – no readings w/ HNu and Mercury analyzer
– Mini Rad at background

Street drains – no readings with all instruments

Gene Florentine 10/11/89

Wednesday 10/11/89 Site Sketch



G. Flocatin 10/11/89

G. Flocatin 10/11/89

2

6

Wednesday 10/11/89

1115 Distance btwn So. side of church and Colvin Blvd is approx 80–90 ft

Distance from west side of church to 96th st is approx 45 to 50 ft

Distance from NW corner of church to fence to north approx 85 to 95 ft

Distance from 96th to 97th st is approx. 250 ft

Black top approx ~~60 x 70'~~ 120' x 120' GF

Distance from blacktop to north fence approx. 120 ft.

Distance from east side of church to 97th st is approx 40 ft.

There are power lines on 3 sides of the site along the easements.

1130 G. Floret } depart site
J. Nickerson
A.K. Gupta

Gene Floret 10/11/89

ecology and environment, inc.

International Specialists in the Environment

Job Number YD - 7000

97th St Methodist Church

Niagara Falls, NY

Geophysical Survey

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Recycled Paper/569058

HAGER-RICHTER
GEOSCIENCE, INC.

CONSULTANTS IN GEOLOGY & GEOPHYSICS
P.O. BOX 572
WINDHAM, NH 03087

DAVID E. PETROY
GEOPHYSICIST

Jeff Reed

(603) 893-9944

E & E Job Number 40-7030

Telephone Code Number 716-684-8060

Site Name 97th St Methodist Church

State/City Niagara Falls, NY

TDD ______

PAN ______

SSID ______

Start/Finish Date 10/24 / ______

Book 2 of ______

E & E Emergency Response Center: (716) 684-8940

Tuesday 10/24/89

weather: Cloudy, warm 50°F, Temp expected between 60-70°F

0800 Met Hager-Richter Representatives D. Petroy and J. Reed at Red Jacket Inn. Drove to site

Hager-Richter Geoscience, Inc. P.O. Box 572 Windham, NH 03087

0820 Thomas Dane came over to inform the

1039 97th St

Crew where the concrete cells were buried. Mr. Dane stated that the concrete is located behind the Church in the parking lot area (below the asphalt and grassy area). He is supposed to meet with A.K. Gupta tomorrow.

(NYSDEC)

G. Florentino (E&E) will supervise geophysics

Hager-Richter Crew is setting up to perform Seismic Survey calibration lines (Seismic Refraction)

Today's objective: Run Seismic survey

Equipment: EG&G Model ES-1225 Exploration 12 channel Seismograph

Using 2 geophone spacings for calibration 10 ft & 20 ft

The first test line is located E-W on the grass immediately adjacent the the northeast edge of the blacktop. Gene Florentino 10/24/89

10/24/89

Between the wells and the blacktop

The Seismograph is battery operated with its own power pack

The seismograph is coupled to a digital magnetic recorder

0930 Geophysical Crew is missing their strike plate

D. Petroy departed site to look for a plate in a nearby scrap yard

0945 D. Johnson (E&E) arrived onsite to observe Geophysics

0955 D. Petroy returned

1005 Began shooting test line (SL-1) with 10 ft spacing

Gain settings - 18, 24, 24, 30, 36, 36, 42, 42, 48, 45, 54, 54

1020 Reverse shot

D. Johnson departed site to have a strike plate cut

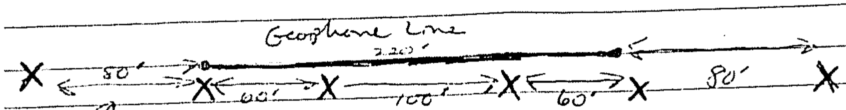
A.K. Gupta (NYSDEC) arrived onsite

1025 Setting up test line with 20 ft spacing adjacent to 1st line (SL-1)

Gene Florentino 10/24/89

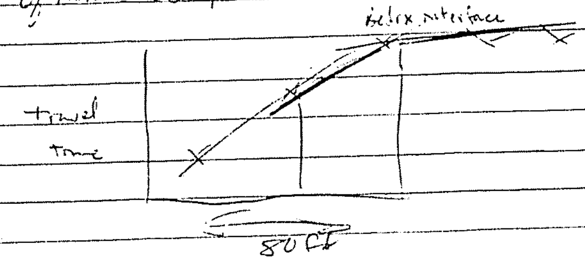
Tuesday 10/24/89

Shot Set-up



X = shot points There will be 6 shot points per line

This distance is calculated using a graph of intersecting lines from the test line



Line SL-1 located E-W in NE corner of site adjacent to black top (on grass) immediately south of existing wells

Cable Length = 0 - 220 ft

Flags and paint will be placed at each shot point. Wood stakes will be placed at the beginning and end of each cable later this afternoon, or tomorrow.

Gene Florentine 10/24/89

10/24/89

Chanel Gain Trace size

CH	GN	TS	80 ft east of Geophone No. 1 GN increased because signal weak
1	30		42
2	36		48
3	GF ~~60~~ 36		48
4	42		54
5	42		54
6	GF ~~48~~ 42	want TS	54
7	48	to be approx	60
8	48	10	60 60
9	48	to get good signal	(as little noise as possible)
10	48		60
11	54		66
12	54		66

The plate is struck several times to stack the signal, (approx 30-35 stacks should be maximum), Data dumped into "First Picks" then Gremex for interpre.

1220 Finished Line SL-1

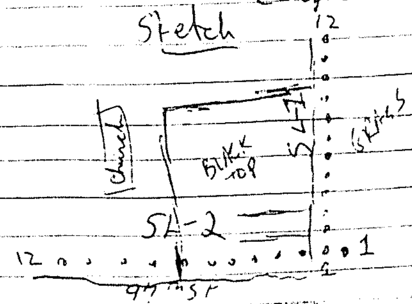
Setting up Line SL-2

Location: N-S along east side of church approximately 18 ft west of the Curb

Geophone No. 1 from Line SL-1 will be Geophone No. 2 for Line SL-2

(Geophones 3→7 are drilled into black top)

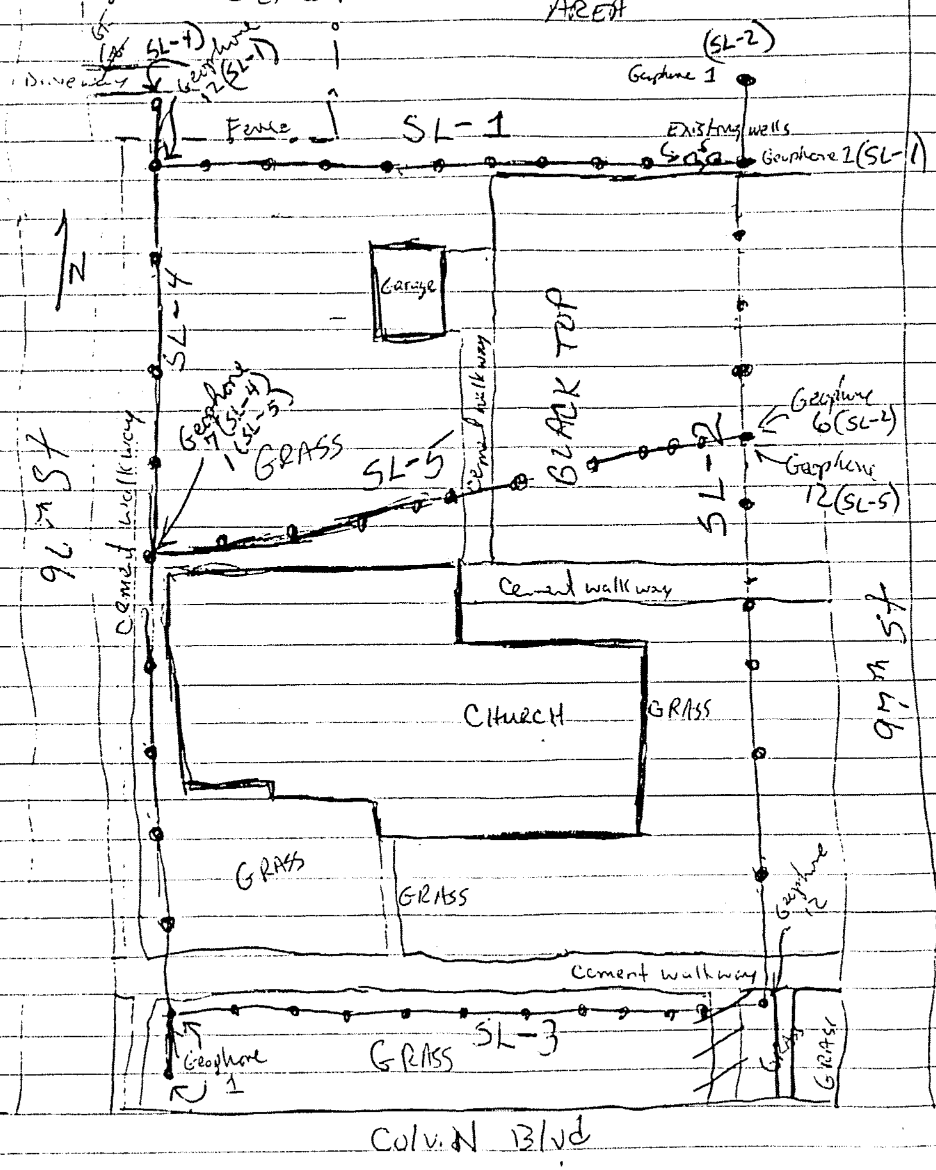
Sketch



See Next Pg for larger sketch

Gene Florentine 10/24/89

Tuesday 10/24/89
Site Sketch
(not to scale)
of Seismic Lines



G. Florentine 10/25/89

10/24/89

1250 Began Line SL-2

1300 G. Florentine departed site to pick up lunch for Crew.

1330 G. Florentine returned to site
Crew breaks for lunch

1415 Finished Line SL-2
Setting up for Line SL-3
Location: E-W along south side of Church, approx 1 ft south of cement walkway (see sketch previous page).

Geophone 12 for SL-3 = Geophone 12 for SL-2

1420 A.K. Gupta departed site

1435 Began Line SL-3

1435 G. Florentine departed site to pick up wood Stakes

1505 G. Florentine returned
A.K. Gupta & Dave Forster (NYSDEC) onsite

1510 A.K. Gupta departed site

1520 D. Forster Departed site

Gene Florentine 10/24/89

10/24/89

HP Filter (20 Hz) should be off for refraction

60 Hz notch filter removes electrical interference

Can preview and therefore only stack the good traces rather than stacking all traces.

1610 Finished SL-3
Setting up SL-4
Location: See sketch
N-S along west side of Church
(approx 10 ft west of Church)

SL-3 {Geophone No. 1 = Geophone No. 2} SL-4

SL-1 {Geophone No. 12 = Geophone No. 11} SL-4

1625 Began line SL-4

1635 A.K. Gupta onsite

1730 Finished Line SL-4
A.K. Gupta departed Site
Setting up Line SL-5
Location: See sketch
E-W, Approx 10 ft north of Church
(NW corner)

SL-4 Geophone No. 7 = Geophone No. 1 SL-5
SL-2 Geophone No. 6 = " "

[signature] 10/24/89

10/24/89

1745 Began line SL-5

Geophones 7 → 12 in Blacktop
Geophone prope is only approx 1/2" in blacktop.

1830 Finished Line SL-5
Crew packing equipment

1900 Crew departs site for day

[signature] 10/24/89

Wednesday 10/25/89

Weather: cool 40°F, fog, temp expected to reach 70°F

0800 Crew arrived onsite
G. Florentin (E&E)
A.K. Gupta (NYSDEC)
J. Reed } Hager Richter
D. Petroy }

Today's objective = perform GPR survey

Crew setting up equipment

Setting up grid
measuring from corner of 97th & Colvin to the north along the curb.
Distance 240 ft (3 ft south of edge of black top) Total distance 260 ft

Setting up 20 ft x 20 ft grid for initial survey. 10 ft grid lines will be run in areas containing suspected debris

GF After setting up grid noticed that Colvin is not perpendicular to 97th St. The grid is being adjusted.

Measured 260 ft from Colvin & 97th St due north along the curb to square off grid.

Lines will be run generally E-W or W-E across the site

Gene Florentin 10/25/89

10/25/89

Equipment: GSSI SIR SYSTEM-3
12 V Batt. operated Model PR-8300 Profile Recorder

300 MHZ Antenna Model 3105AP
Single unit (Trans. model 767, Rec. model 766DA)

will Run test lines to calibrate instrument for best penetration

0935 D. Forster (NYSDEC) arrived onsite
He is questioning whether Hager-Richter was supposed to perform seismic reflection or refraction. will have to check workplan to confirm work plan. Dave feels that the crew should have done reflection

The grid on the west side will be offset 20 ft to south, Therefore the survey lines will be perpendicular to 97th & 96th St.

The lines will be run from east to west

0943 D. Forster departed site to the public information office to check the workplan and check depth of existing wells

J. Reed said bedrock is too shallow at this site to do seismic reflection (bedrock > 30 ft) and need shallow water table (<5 ft) because unsaturated sed. ~~atten~~ attenuate the signal

G. Florentin 10/25/89

Wed 10/25/89

Approx. depth of penetration 20 NS (about 5 ns/ft) therefore 4 ft.

0955 Dorothy Richter arrived onsite

Equipment settings:
Print polarity +
Paper take-up —
Lines/inch 100
Scans/sec 16
Gain surface center Deep
=0 -0 -0

Range 750 NS

100	x1	on	10	Auto	up	Radar
range	Radar speed	scale lines	high pass (cycl/scan)	Div	Phase	Graphic mode
DC	Start	=0	50	Signal	50Khz	int
coupling	marker	Threshold	Low pass	Position	Xmit Rate	Ckcl

1000 Began Running Lines starting from the NE corner of the site

Lines along east side of church will be run from east to west, also along the west side of the church.

1235 Finished all E-W lines, no apparent indication of concrete cells

All E-W lines were at 20 foot intervals

Gene Florentin 10/25/89

10/25/89

Crew is packing equipment to break for lunch.

After lunch, additional E-W lines will be run in the adjoining lot to the NE, and N-S lines across the church parking lot.

1300 Entire crew departed site for lunch

1350 Crew returned.
Setting up for E-W lines in adjacent grassy area

1400 Began surveying

1445 Began N-S lines
Set up 7 N-S lines from 5th St curb to west edge of black top?

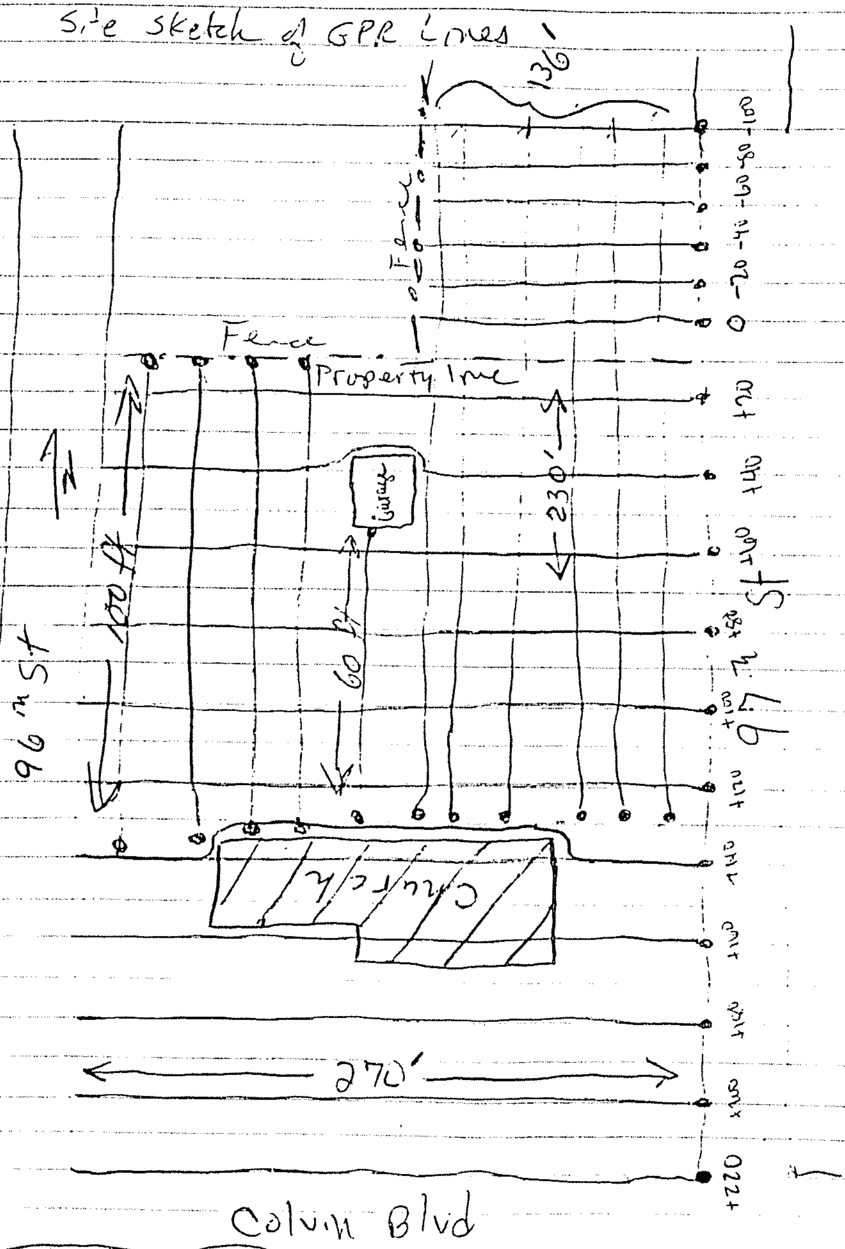
Lines will be run from N to S from the adj. lot to the church

1550 Finished area
Setting up to survey N-S lines btwn No. property fence and No. side of church, west of Garage at 20 ft spacings.

1630 Finished survey. Crew packing equipment
1645 G. Florentin departed site
Gene Florentin 10/25/89

Wednesday 10/25/89

Site sketch of GPR Lines



[illegible] 10/25/89

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ecology and environment, inc.

International Specialists in the Environment

Job Number YO-7040

97th Street Methodist Church
9610 Colvin Blvd
NIAGARA FALLS, NY

DRILLING, SAMPLING, TEST PITS

ecology and environment, inc.
Recycled Paper/569058

E & E Job Number 40-7040

Telephone Code Number

Site Name 97th St Methodist Church
9610 Colvin Blvd.

State/City Niagara Falls, NY

TDD

PAN

SSID

Start/Finish Date 11/29/89 /

Book 1 of

E & E Emergency Response Center: (716) 684-8940

896-9550

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Wednesday 11/29/89

Weather: Partly cloudy, cold, 25°F, Light wind

Today's objective: Drill GW-3257 to clay layer, set surface casing, and drill and install another well.

E&E Crew: G. Florentino - Geologist
B. Wright - Site safety Officer

SEE Health and Safety Logbook for site activities
SEE DRILL LOGS for borehole soil and well construction descriptions.

1200 Placed wooded stakes at proposed well locations and surface soil sample locations 1 through 6. Locations 7 and 8 are beneath the black top.

1220 Began Collecting Soil Samples (see pg. 8 for formatting)
SS-1, SS-2, SS-3, SS-4, SS-5, SS-5MS/MSD, SS-6

SS-7 and SS-8 will be collected later today or tomorrow when the proper equipment to break the blacktop can be obtained.

1245 Finished Soil Sampling
New objective: Drill and Install GW-3155
1315 Buffalo Drilling Co. setting up to Drill GW-3155 located near the northwest corner of the church property
G. Florentino 11/29/89

11/29/89

Driller Charles Nicometi
Driller's Helper Mike Vogl
Drill Rig Mobile B-34
Augers 4 1/4" I.D.

Crew decontam rig and augers at Love Canal waste water treatment Plant

1335 Crew breaks for lunch

1415 Crew back on site setting up to drill

Dave ~~Forster~~ Foster (NYSDEC) will be present onsite as the state's geologist

Camera - Kodak Fling 35 Disposable 400 ASA
Roll No. 2

OVA not running due to cold weather
Will borrow a unit from Hyde Park Office
1545 Broke holes thru black top and collected SS-7 - Sample Dia. See Pg 14
1550 New OVA arrived
Began drilling
Split spoon 2" OD x 2'
See boring Logs for description

1600 Split Spoon No. 1 0-2 ft Frame 23
1615 SS No. 2 2-4 ft (3-4 ft sampled for Full TCL and Geotech) Frame 22
1625 S Spoon No. 3 4-6 ft Frame ~~20~~ 21
1640 S. Spoon No. 4 6-8 ft Frame ~~20~~ 19

1650 Cathead Rope is frayed. Stopped drilling. Too dark to Continue. Collected SS-8 sample (Sample Described see pg 14)
1700 Drill Crew departed site G. Florentino 11/29/89

Thursday 11/30/89

Weather: overcast, cold, 32°F, temp expected to drop to 18°F, winds 5-10 mph from the west

Today's objective: Finish drilling GW-3155 and install, then drill GW-3159

0800 G. Florentino arrived onsite
M. Vogl arrived onsite

0815 B. Wright arrived onsite after re-charging CVA at Hyde Park office

D. ~~Faster~~ Foster GF and C. Nicometi arrived onsite

0820 setting up to continue drilling GW-3155

0850 Split spoon No-5 Frame ~~8~~ ~~18~~ ~~14~~ 18 GF ~~18~~ ~~16~~ ~~18~~ 17 GF

0900 S-Spoon No-6 Frame 16 (sampled for geotech analysis)

0905 Frame ~~7~~ ~~16~~ 16 GF View to east of GW-3155 location

Total Depth of borehole 12.4 ft
borehole dry. Setting well with 5 ft screen as advised by the NYSDEC onsite Geologist D. ~~Foster~~ Foster GF. Mr. Foster said they may be water in the spring.

Gene Florentino 11/30/89

11/30/89

0945 Setting 2" I.D. PVC Flush threaded casing
5 ft screen 0.010 Slot

Sand No. 2 Silica 100 lb bags
US Silica Q-ROK

Approx. 6" Sand Sump below screen

Supplies: 10 ft riser
5 ft screen
2 bags sand
½ bucket Pellets
1½ Cement bags Type I Portland Cement
1 steel sfc casing
1 lock
1 Drum

1045 GW-3155 complete
Moved Drill Rig to GW-3257

1100 Drillers are Deconning Augers. will return at 1230 after lunch break

1230 G. Florentino & B. Wright returned to site
Drillers returned to site
Setting up to drill GW-3257

1245 D. Foster arrived onsite

1250 D. Foster Departed Site

The upper fractured clay zone will be sealed off with steel surface casing
Borehole will start with 6¼" I.D. Augers

Gene Florentino 11/30/89

6

Thursday 11/30/89
15 ft GF

1250 Frame 8 View to east of GW 3257 location

Began Drilling

1305 ~~1400~~ GF Split Spoon No. 1 0-2 ft Frame ~~8~~ ~~14~~ ~~13~~ 14 GF

1330 S. Spoon No. 2 2-4 ft Frame ~~12~~ ~~12~~ 13

1346 S. Spoon No. 3 4-6 ft Frame ~~12~~ 12 GF

1358 S. Spoon No. 4 6-8 ft Frame ~~12~~ ~~10~~ 11 GF

Split spoon No. 2 was sampled for full TCL

Split Spoon No. 4 was sampled for Hydrometer analysis

1420 S. Spoon No. 5 8-10 ft Frame ~~13~~ ~~10~~ 9 and 10 GF

1430 S. Spoon No. 6 10-12 ft Frame ~~14~~ 8 GF

Drilling with 6¼" auger will cease at approx 11.5 ft, and a steel surface casing will be placed in the borehole tomorrow.

1450 Drillers setting up to drill and install GW-3157 approx. 10 feet west of GW-3257 between the south side of the church, north of the side walk to the west of the church entrance on colum Blvd.

G.F. Fleet 11/30/89

11/30/89

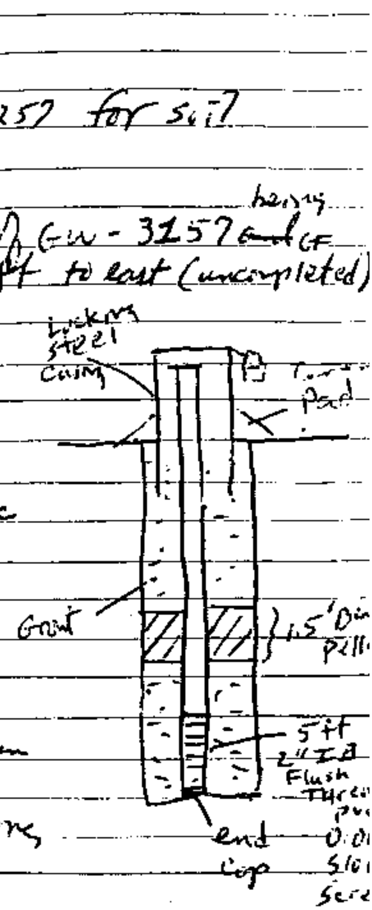
1510 Began drilling

See boring log GW-3257 for soil descriptions

1525 Frame ~~15~~ 7 GF View to NW of GW-3157 being drilled and GW-3257 10 ft to east (uncompleted) GF

1530 Began setting casing GW-3157

Screen set from 10-5 ft
Sand Pack 10-4 ft
Bentonite 4-3.5 ft
Grout 3.5 ft - sfc



Supplies used:
1 end cap
1 top cap
5 ft 0.010 slot 2" ID PVC screen
10 ft riser
1 Locking steel Protective Casing
1 lock
1.5 bags No. 2 sand
0.5 bucket bentonite Pellets
1.5 bags Portland Cement
1 DRUM

Gave D. Fest a set of well keys

1630 Well Complete, site secured, entire crew departed site

Gene Fleet 11/30/89

FRIDAY 12/1/89

WEATHER: Partly cloudy, cold 17°F, temp expected to reach 25°F, light wind

0820 G. Florentino arrived onsite.
B. Wright and M. Vogl onsite

Today's objective: set surface casing in GW-3257, drill and install GW-3159, then continue drilling GW-3257 if grout is partially set. The drillers will use quick set cement.

0830 C. Nicometi arrived onsite. Drillers are setting up to steam clean casing and augers.

0930 Decon complete. Setting up to set casing in GW-3257

0950 D. Foster arrived onsite

Soil sample location measurements

SS 1, 2, 3, and 4 are oriented in a straight line (N42E) to the north of the church;

SS-1 is ~~41.3"~~ 19.3' north of the NW corner of the garage

SS-2 is 17' west of the NW corner of the garage

SS-3 is 54.1' SW of SS-2
G. Florentino 12/1/89

12/1/89

SS-4 is 60' SW of SS-3

SS-5 is 15' ~~North~~ South of the east corner of the entrance to the church on Calvin Blvd.

SS-6 is 20 feet east of the NE corner of the church
re-measured (see pg 15)

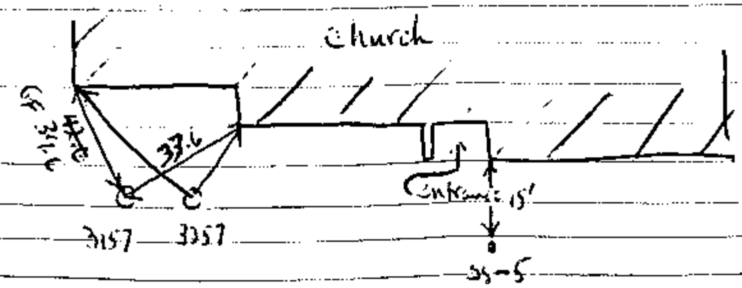
SS-7 is 43.4 ft north of the church (brick), and 37.5 ft from the NE corner of the ... section with the ... roof
~~re-measured (see ...)~~

SS-8 is 115.6 ft east of the ... corner of garage and 93.6 ft from NE corner of the church

Sample location

GW-3157 is located ~~42.6~~ 39' SE of the SW corner of the church and 33.6' SW of the SW corner of the ... section with the peaked roof (see sketch)

GW-3257 is ft SE of the SW corner of the church and ft SW of the SW corner of the church section with the peaked roof (see sketch)



G. Florentino 12/1/89

Friday 12/1/88

GW-3155 is 74.1 ft [illegible] of the NW corner of the garage and 91 ft from the NW corner of the church

1040 Drill crew is setting surface casing in GW-3157

Poured 1 bag of Type III High Early [illegible] Cement into hole, then set casing

Drillers are using Type III so they can continue drilling this afternoon.

Surface casing is 11.5 ft and will be set flush to ground surface

1105 Casing in place

Materials used:
11.5' of 8 1/4 Steel Casing
2 bags of Type III C[illegible]

Setting up to drill GW-3159

1135 Frame ~~16~~ 6 of view to NW of GW-3159

Began drilling

Ge[illegible] [illegible] 12/1/88

12/1/88

1135	S. Spoon No. 1	0-2 ft	Frame ~~17~~ 6 of 6	
1150	S. Spoon No. 2	2-4 ft	Frame ~~18~~ # of samples for Fill	
1200	S. Spoon No. 3	4-6 ft	10 pictures?	
1215	S. Spoon No. 4	6-8 ft	Frame 19 3 of	
1220	S. Spoon No. 5	8-10 ft	Frame 20 2 of	
1230	S. Spoon No. 6	10-12 ft	Frame 21 1 of	
1245	S. Spoon No. 7	12-14 ft	Frame 22 0 of	

Borehole terminated at 12 [illegible] bentonite pellets were placed at [illegible] bottom to fill in the split spoon hole.

1250 Setting well casing

Screen 12-7 ft
Sand 12-4 ft
Bentonite Seal 4-3.5 ft
Portland Cement 3.5-0 ft

Supplies used: 1 end cap
1 Top cap
5 ft 2" ID Flush 0.010 slot screen
10 ft ~~15 ft~~ 2" ID riser
1.5 bags Sand
0.5 buckets pellets
1.5 bags Grout
1 locking steel casing
1 lock
1 Drum

Ge[illegible] [illegible] 12/1/8[illegible]

Friday 12/1/89

1400 GW-3159 Complete

Drill rig was placed over the GW-3257 borehole, the borehole was covered with plastic and a plank of wood.

The grout was still too soft to continue drilling GW-3257, therefore the well will be completed on Monday 12/4/89.

The site was secured, and the drill crew will clean augers before leaving for the day

1420 Entire Crew departed site

Gene Florentino 12/1/89

Monday 12/4/89

Weather: Cold, 20°F, Snowy, light wind

Today's objective: Finish drilling and install GW-3257.

0830 G. Florentino	E&E	onsite
B. Wright		
D. Locey	NYSDEC	
C. Neconetti	Buffalo	
M. Vogl	Drilling	

Drillers are setting up rig

~~Begin Drilling~~ GF

0950 Drillers found out that the auger bit does not fit in the surface casing. Surface casing is 8.0" ID. and 8 3/4" O.D., and augers are 4 1/4 inch ID and 8" O.D., but bit teeth stick out further.

C. Neconetti is calling to find out if the augers can be delivered.

D. Locey pointed out that the soil samples taken beneath the parking lot should have been taken at a depth of 2 ft below the Blacktop. G. Florentino called T. Bogolin (E&E) and informed him to discard SS-7 and SS-8 delivered 11/29/89.
D. Locey is checking with NYSDEC in Albany to find out if they want both Test Pits and soil samples from beneath the Parking lot.
G. Florentino 12/4/89

Monday 12/4/89

1030 C. Nesmith said the augers will be delivered

The drill crew will drill approx 1 to 2 feet below the [illegible] Top [illegible] sample SS-7 [illegible] SS-8

1050 Began drilling Borehole SS-7

Drilled 1 ft

Split Spoon No. 1 1-3 ft

Borehole 11.8 PPM above background

Blow Counts 6-5-5-6
Recovery 15% 0 PPM not enough [illegible] sample

1105 Borehole 14.8 PPM

Drilled down to 2 feet

Split Spoon No. 2 2-4 ft

Blow Counts 2-3-4-6
Recovery 1% 0 PPM

Kodak Film 35 400 ASA No 3

1110 Frame 13
View to SE of borehole SS-7

OVA Readings may be diesel fumes

Gene [illegible] 12/4/89

12/4/89

1115 SS-7 2-4 ft not enough sample will try again adjacent to borehole

0.01 mg/m³ on mercury analyzer

1130 Began drilling to 2 ft approx 2 ft slightly NE of the 1st borehole (approx 45 ft north of church

Borehole 0-2 ft 18.2 PPM

Blow Counts 2-4-7-9
Recovery 40% 10 inches

1145 Split spoon NO. 1 2-4 ft
Top 6" med to Dk gray, orange mottled clayey silt, some small pebbles, brittle, moist

Bottom 4" Reddish brown, orange mottled, silty clay, some ash and small pebbles, semi plastic, moist

Auger and spoon decontaminated

1200 Began drilling borehole SS-8 to 2 feet

1205 Borehole 0 PPM
Split Spoon NO. 1
Blow Counts 3-7-12-21
Recovery 70%

1206 Frame 2 view of SS-8 to south

G. [illegible] 12/4/89

Monday 12/4/89

SS-8
Med. to dark brown, orange and gray mottled, v. fine sandy, clay and silt, brittle, dry

ED Reilly - Channel 7 news onsite

1215 Borehole complete - Waiting for augers to arrive -

Drilling Down-time

Setting up rig at GW-3257
Decon augers

1245 Crew breaks for lunch
1300 Augers arrived onsite
1330 Returned to site
waiting for drillers

1355 Drillers returned setting up to drill GW-3257 with ~~3 3/4~~" augers
6" 3 1/4" ID

1415 Begin drilling

1432 Split Spoon No. 7 12-14 ft From 3 21
1443 S. Spoon No. 8 14-16 ft " 4 20
1500 S. Spoon No. 9 16-18 ft 5 19
1515 S. Spoon No. 10 18-20 ft 6 18
1530 S. Spoon No. 11 20-22 ft 7 17
1544 S. Spoon No. 12 22-24 ft 8 16
GF
G. Floretin 12/4/89

12/4/89

1619 Split Spoon No. 13 24-26' From 9 / 15 GF

1645 Augers Refusal at approx 25 ft.

Will continue tomorrow

1650 Drill Crew departs site

1700 E&E Crew departed site

Gene Floretin 12/4/89

Tuesday 12/5/89

Weather: Overcast, cold, 24°F, light wind, temp expected to reach 30°F

Today's objective: Finish drilling GW-3257

0845 G. Florentino EFE
B. Wright EFE
J. Barron Bflo drlg. } onsite

0850 D. Locey - NYSDEC - Bflo onsite

J. Barron will replace C. Niconetti. C. Niconetti is sick today.

0900 Began drilling. will attempt to advance augers past 25 feet. current have auger refusal

0910 Still have auger refusal. Drillers will pull augers, install a temporary intermediate casing, and core through the bed rock.

J. Barron went to steam clean the casing
0935 D. Locey went to call D. Foster in placement of...
0940 J. Barron returned. Drill crew is filling water tank. It will probably take an hour because they are using a garden hose.

J. Barron will pull the augers and set the temporary casing.
G. Floret 12/5/89

12/5/89

1005 Drill Crew
J. Barron - helper
K. Scott - Driller
E. Edmister - helper
are setting up to continue drilling

1025 Began pulling casing

1055 Began setting temporary casing

Borehole open to 24.3 ft

1130 Casing resting on top of bedrock
Setting up to Core

Core Bit 3 7/8" OD

Collected Drill water sample from drillers water tank and hose GW-3257-D

1205 Frame ~~10~~ 14 ft View to NE of Drill rig coring GW-3257

Began coring

1220 Cored approx 1 ft
Stopped to pump out water tub

1235 Began Coring another 5 ft

1257 Stopped Coring. Adding a 2 ft section
G. Floret 12/5/89

Tuesday 12/5/89

1301 Began coring another 2ft

1315 Stopped coring – ran out of water
Depth approx 4.5 ft with core barrel

Pulling core barrel to check for bedrock

Borehole open to 30.1 ft

1320 From A 1st core run approx 5ft
Recovered 1.2 ft

SEE DRILL LOG FOR DESCRIPTION

Waiting for water

May not be in bedrock since so little was recovered

1450 Began Coring

1540 Depth 34 ft, continuing to drill

1610 Depth 36 ft will continue to approx. 40 ft

1635 Began drilling

1652 Depth 38.5ft will continue to 40ft

G Floret 12/5/89

12/5/89

1655 Began drilling

1717 Depth 40ft
Pulling Core barrel

1800 Too dark to remove core from core barrel. Site secured, crew departed site

Gene Floret 12/5/89

recycled paper

ecology and environment

Wednesday 12/6/89

Weather: overcast, cool 35-40°, temp expected to drop in 20's

Today's objective: Set well casing on GW-3257

0745 G. Flowers arrived onsite
0800 B Wright arrived onsite
0820 D. ~~Lowe~~ Lacey arrived onsite

0900 J. Barron returned from decon pad. Drill crew is still decoming.

Pulling core and measuring borehole depth. 39.3 ft

0937 K. Scott and J. Barron back onsite

Pulled Core
Recovered 9 ft

Frame 12 View of entire core from 25-40 ft

See well log for description

1000 Began setting casing
Placed a few inches of sand on bottom of borehole

Gene Flowers 12/7/89

12/6/89

Supplies
10 ft 0.010 slot PVC Flush thread screen
35 ft PVC Riser
1.5 bags Sand (No. 2)
6 bags Cement
1 Protective Casing (locking)
1 Top cap
1 bottom Cap
1 Lock
5 Drums
1 Core Box
1 bucket of Pellets

PVC was pulled up from 39 ft to 37.6 ft during removal of steel casing

Bottom of Screen approx ~~38 ft~~ 37.6 ft GF
10 ft of Screen to ~~28 ft~~ 27.6 ft GF
Sand Pack to ~~25 ft~~ ~~24.4 ft~~ 26.0 ft
Bentonite Pellets to 23 ft

1245 Bentonite Bridged in Temporary Casing - Drillers working on removing the bridge.

1450 Temporary Casing removed. Crew setting up to grout well in place.

1515 Rig departed site for decon pad

1645 Well complete except for cement pad which will be set tomorrow.

1 Drum at Decon pad
site cleaned and secured

1715 Entire Crew departs site G. Flowers 12/6/89

24

Monday 12/18/89

weather: Cold, 9°F, Sunny

0720 G Florentino arrived at E&E to pick up equipment

0800 Arrived on site

0805 T. Grieg arrived on site from Grieg Environmental

0810 Backhoe arrived
Operator Ken Schebell

Setting up test pit along line 0+80 between lines C+D (see geophysical survey for grid map)

Test pit located beneath blacktop parking lot

0830 Went to DEC office on Colvin Blvd to notify them that the test pit is ready to begin. A.K. Gupta not there yet. left message.

0840 Began digging Test Pit No 1
Length 20ft width 2.5ft
Background OVA 0PPM

G. Florentino 12/18/89

12/18/89

0840 Frame 12 11 ft View to west of Test Pit No. 1

0900 Top 1.4ft Blacktop followed by fill (broken rock and gravel)

0905 Frame 13 10 ft View to west of test pit

0910 Frame 14 9 ft View to north of inside of Test Pit No. 1.

From 1.4 to 2.9ft Dark gray-green silty Clay

2.9ft to 4.0 ft red-brown silty clay.

1 PPM at depth of 3 ft

Broke a 4" clay pipe trending N-S near the west end of the test pit at a depth of 3 ft. Water ran into test Pit

0915 Soil sample collected at the gravel-Clay interface at 1.4 ft.
TP-1

Test Pit terminated at 4ft

0930 Called P. Felgemacher to deliver a Mercury Vapor analyzer.

0940 Departed site to purchase more plastic to deposit soil

G. Florentino 12/18/89

recycled paper

I-29

ecology and environment

Monday 12/18/89

1000 Returned to site setting up for test pit No. 2 located E-W along line 0+20 between lines G & F (see geophysical report for Grid location)

1005 Began digging
Length 20ft width 2.5ft
Frame 15 8ft View to east of Test Pit No. 2

Top 1 ft contains blacktop followed by gravel and bricks

1015 Frame 16 7ft View to south of test Pit No. 2

1022 Frame 17 6ft View to north of Inside of test Pit No. 2

Top 1.4 ft Fill material (Blacktop followed by gravel and red bricks).

Next 2.0 ft is medium gray, orange mottled silt and clay with occassional tree roots

3.4 ft to 4.0 ft red-brown clay

Collected soil sample at bottom of test Pit (4 ft) because of OVA readings of TP-2
Gene Florentino 12/18/89

12/18/89

3 PPM above background.
1024 A.K. Gupta (NYSDEC) arrived onsite
1025 P. Felgemacher arrived onsite with Mercury vapor analyzer. Tested soil from both Pits. Zero Readings of Mercury

Setting up for test Pit No. 3 located N-S along line F between lines 0+70 to 0+90 (see geophysical report for grid locations)

Told A.K. That a sample was collected at the fill/clay interface from Test Pit No. 1, and a sample will be collected from the bottom of TP-2 because of the 3 PPM OVA reading above background. A.K. Agreed.

1045 Began digging Test Pit No. 3
Length 20ft width 2.5ft
Frame 18 9ft View to west of Test Pit No. 3

1050 Frame 19 4ft View to north of TP No. 3

There are red bricks below black top

1110 Frame 20 3ft View to North of Test Pit No. 3
Note piece of steel and ree-bar

1110 Frame 21 2ft View of concrete fragment from (appears to be a piece of cinder block) TP-3
G. Florentino 12/18/89

12/18/89 Monday

1110 Frame 22 (1 ft) View of rubber boot from Test Pit No. 3
1 PPM above background at depth of 2 ft

1111 Frame 23 (0 ft) View to west of Side of Test pit No. 3

Top 2 ft Fill material
(Black top followed by large rock fragments and gravel and red bricks.
other debris noted – angle steel, ree-bar, plastic, rubber boot, concrete block fragment

Next 1.3 ft med. gray silt and clay followed by red-brown clay at bottom of test pit

1135 Began backfilling TP-3 in the reverse order in which the soil was removed.

Saved the Concrete blok in a zip lock bag for mercury analysis

1136 A.K. Gupta departed site

1220 Test Pits are backfilled. There is approx. 2 ft of debris above grade. The backhoe operator compacted it as best as he could. G.H. 12/18/89

12/18/89

1220 A.K. Gupta arrived onsite. Told him that Green Environmental will be contacted for the cold patch, and A.K. will be notified when it could be done. Drum will be needed for excess material.

Backhoe departed site

1225 A.K. Gupta departed site

~~Frame 24 View to west of completed site~~

1245 Departed Site

G. Horton 12/18/89

Thursday 12/21/89

weather: very cold, 5-10°F, sunny, light wind

Today's objective: sample the 4 new wells
and 2 existing wells

1200 G. Florentine and M. Donnelly departed E&E
for the ASC. Picked up equipment

1340 Arrived at Love Canal DEC office to
obtain well key for 3151.

1345 Arrived onsite. Setting up to sample
wells.

1400 GW-3257 Water level from top of PVC 11.83 ft
0 PPM OVA

GW-3157 Water level 9.85 ft
0 PPM OVA Total Depth 11.35 ft

Began purging GW-3257

GW-3155 6.38 ft water level
1 PPM OVA

GW-3151 7.2 ft water level
from top of steel
6 PPM
24.9 ft total depth

G. Florentine 12/21/89

Thursday 12/21/89

GW-3251 12.55 ft water level from
top of steel
OVA stopped
working
total depth 32.65 ft

1440 Too cold to continue working
stopped purging GW-3257 and departed site

G. Florentine 12/21/89

Friday 2/23/90

Weather: Snowing, 30°F

0830 G. Florentino (E&E) arrived onsite

Today's objective: Show OM Public Surveyors all sample locations, well locations, Test pit locations, and end points for the seismic lines to be surveyed.

Checked all locations. A wood stake and orange pin flag was still in place for most locations. Pin flags will be placed when needed.

All locations have been clearly marked on the detailed site sketch and will be given to the surveyors.

The steel stakes are still marking the trench boundaries, however, some are not standing vertical.

0930 Brian M[illegible] arrived onsite. Pointed out all sampling locations [illegible] a detailed [illegible]

1000 Everyone [illegible]

G. [illegible]

Aug 1 1990 Wed

Weather: Sunny, Cool 65-70°F

0800 G. Florentino (E&E) arrived onsite
J. Greig (Green Env.) onsite waiting for backhoe

0802 backhoe arrived

Today's objective: repair broken pipe in test pit, drum excess soil and plastic, and patch test pits with black top

0805 Began excavating TP No. 1 to repair pipe

Pipe was located. Some water entered the Test pit

0825 J. Greig departed the site to pick up more drums and a piece of pipe

The backhoe operator will level out test pits 2 & 3 while waiting for J. Greig to return.

0855 Black top truck arrived.
Began covering Test Pit No. 3

0900 J. Greig arrived onsite
Began repairing pipe. 3" PVC was inserted in the clay pipe, and each end was sealed with grout.

G. Florentino 8/1/90

Wed. 8/1/90

0910 Test Pit No. 3 Complete
Began Patching Test Pit No. 2

Soil from Test Pits 2 and 3 was Compacted.

excess soil from Test Pit No. ~~2~~ 1 is being drummed

1045 Test Pit No. 2 and 1 are patched
J. Grieg + Backhoe departed site

G. Flouten departed site

One crew member remains to smooth blacktop

G. Flouten 8/1/90

968
026

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International Specialists in the Environment

Job Number 40-7060

97th St Methodist
Church
Niagara Falls, NY

Well Sampling

Recycled Paper / 568019

1

E & E Job Number ____________________

Telephone Code Number ____________________

Site Name ____________________

____

State/City ____________________

TDD ____________________

PAN ____________________

SSID ____________________

Start/Finish Date 1/8/90 / ____________

Book 1 of ____

E & E Emergency Response Center: (716) 684-8940

Monday 1/8/90

Weather: Sunny, 40°F, light wind

0800 G. Flout & C. Eich arrived at E&E lab to pick up sample equipment

0940 MW-3157 Purge 1 gal
0 PPM HNU
GF ~~No~~
Total Depth from top of PVC = 11.33 ft
Depth to water = 8.89 (from top of PVC

0945 MW-3257 Purge 15 gal
1.0 PPM HNu above background
Total Depth 39.17
Depth to water = 11.4 ft (from top of PVC)

G. Flout 1/8/90

1/8/90

0948 GW-3159 Purge 2.5 gal
0 PPM HNu
Depth to water = 6.95 ft (from top of PVC
Total Depth 14.91

0950 GW-3251 Purge 15 gal
0 PPM HNU
Depth to water = 12.04 ft (from top of steel casing) (top rim of steel)
Total Depth 32.5 ft (from top of steel)

0953 GW-3151 Purge 9 gal
0 PPM HNU
Depth to water = 6.63 ft (from top of steel casing)
Total Depth = 24.84 ft

0957 GW-3155 Purge 3 gal
0.2 PPM above background
Depth to water = 5.25 ft (from top of PVC)
Total Depth = 14.45

G. Flout 1/8/90

Monday 1/8/90

1018 G. Floreth Purging and Sampling GW-3257 (Strong Sewer-like odor - 5 PPM)

C. Eich Purging and Sampling GW-3251

1110 G. Floreth purging GW-3157
C. Eich Purging and sampling GW-3151

Purge GW-3157 approx 3 well Volumes. Very Slow recharge. Purged dry - waiting for recovery

1115 G. Floreth will begin purging GW-3159. Purged 3 well volumes. Slow recharge. Well wait before sample for full recharge

1140 C. Eich Purged GW-3151 dry in 2 well Volumes
G. Floreth 1/8/90

1/8/90

Will wait for recharge, then sample.

1150 Began sampling GW-3157 collected metals + volatile sample. Waiting for recharge

C. Eich purged GW-3155 3 well volumes - dry. Waiting for recharge

1200 Began sampling GW-3159 and ~~3155~~ 3151
CF

1215 Began sampling GW-3155 and 3157
Could only get enough sample for CN from GW-3157. Will not be able to sample for BNA/PCB/PEST because well is dry and recharge is very slow

1230 Finishing sampling GW-3151
G. Floreth 1/8/90

6

Monday 1/8/90

and 3159.

1300 Finished sampling GW-3159 and GW-3151 and departed site

G. Florentine 1/8/90
G. Florentine

7

Wednesday 1/10/90

Weather: 30°F, wet snow, light wind from NW

Today's objective: Re-sample wells for total and dissolved metals because original samples were not filtered, sample GW-3157 for BNA/PCB/Pest because not enough volume was collected on 1/8/90. Also cover test pits with plastic and set up a barrier around them.

0845 B. Kohn arrived at lab
0910 G. Florentine arrived at lab - picking up equipment and supplies

0930 Departed lab to pick up other needed supplies (i.e. bale cord, plastic, caution tape)

1130 arrived onsite, went to Dec office to notify them
G. Florentine 1/10/90

Wednesday 1/10/90

that EtE is onsite and to have them unlock GW-3151,

1145 Setting up to sample GW-3157 and 3257.

1420 Purged and sampled all wells for total and dissolve [illegible]

Sampled GW-3157 for [illegible] / PCB / rest

1436 Set up to cover & stake test pits

1600 the 3 test pits are secured with a plastic cover, nailed to the asphalt, 6 Fence Stakes, and "Caution Do Not Enter" tape

1610 Returned GW-3151 well key to DOE office and departed site

G. Flore[illegible] 1/10/90